

GLM 4

Quick Setup Guide



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1 REGISTERING YOUR PRODUCT

Please register your Genelec products and learn more about your warranty. By joining the Genelec Community, you'll be able to use all GLM Cloud features, ask questions, share experiences and participate in discussions with Genelec users globally.

Register at www.community.genelec.com.

More information about service and technical support is available at www.genelec.com/customer-service.

2 PACKAGE CONTENTS



GLM Adapter



Microphone holder



Microphone



USB cable to
computer connection

3 GETTING STARTED

To take full advantage of your Smart Active Monitoring (SAM) system it is important to become familiar with all the components in the system. More detailed information can be found from the GLM 4, monitor and subwoofer operation manuals.

To set up a monitoring system you will need monitors and subwoofers, audio signal cables, GLM control network cables, GLM network adapter, GLM measurement microphone, and computer with GLM 4 software.

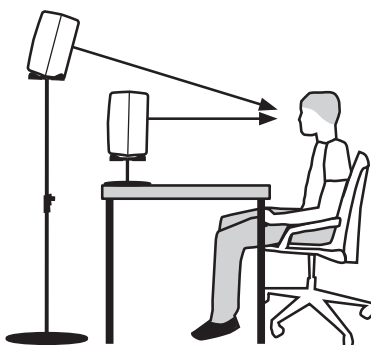
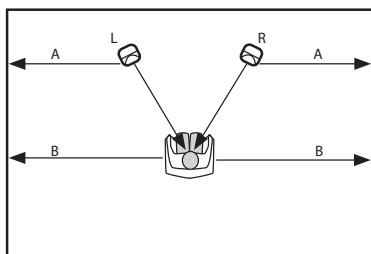


Figure 1. Place monitors symmetrically relative to the walls. Point the acoustical axes towards the listening position.

To set up a Genelec SAM system

- Check the dip switches of the SAM subwoofers and monitors. The 'Stored' switch need to be turned ON if storing the settings to the SAM subwoofers and monitors for standalone use. Other controls are not active when using the stored settings.
- Place SAM subwoofers and monitors in the monitoring room.
- Run audio cables to the SAM subwoofers and monitors.

- Run GLM network cables from the GLM adapter to all SAM subwoofers and monitors.
- Download and install the GLM computer software.
- Create a system setup within the GLM software.

3.1 PLACING MONITORS IN THE MONITORING ROOM

Try to place monitors and subwoofers in optimum locations in relation to surfaces reflecting audio, see Figure 1. Aim each SAM monitor towards the listening position. This becomes your System Layout. More info about the correct monitor placement is available at www.genelec.com/monitor-placement

1. Select listening position so that distances from side walls (B) are equal.
2. Place monitors so that distances to the listening position are equal, and distances to the monitors are equal from side walls (A).
3. Place any subwoofers at the front wall, and slightly left or right from the room centre axis.
4. Aim monitors towards the listening position.

3.2 CABLING FOR AUDIO SIGNALS

Run all audio cables from the audio source to the monitors. When a subwoofer is used, run the same signal to the monitor and the subwoofer. We recommend running the signal to the subwoofer first. The subwoofer has output connectors to facilitate onward connection to the monitors.

Those audio channels that are not going to be bass managed can be run directly to the monitors and do not need to run to the subwoofer. Bass management means using a subwoofer to reproduce the low frequencies for any or all channels.

When you need both analog and digital audio cabling, it is possible to populate both analog and digital inputs and outputs on SAM products. GLM allows Group configuration to be either analog or digital. Note that the 8320 features an analog input only.

3.3 ANALOG STEREO WITH A SUBWOOFER

Before cabling, turn off the power in all monitors and subwoofers.

- Connect (Left) audio cable from the source to the subwoofer connector ANALOG IN 1.
- Connect a cable from subwoofer ANALOG OUT 1 to left monitor ANALOG IN.
- Connect (Right) audio cable from the source to subwoofer ANALOG IN 2.
- Connect (Right) audio cable from Subwoofer ANALOG OUT 2 to right monitor ANALOG IN.

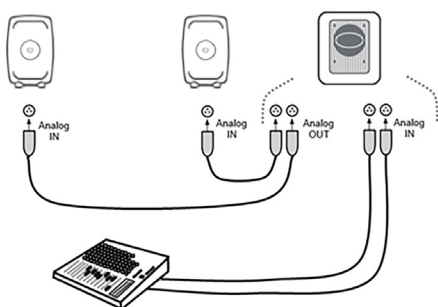


Figure 2. Analog stereo cabling with a subwoofer.

3.4 CABLING OF THE CONTROL NETWORK

The GLM control network cabling is very easy. Connect the GLM adapter to the computer USB port using the supplied USB cable. Connect the GLM adapter to all SAM monitors and subwoofers in daisy-chain fashion (Figure 3) using the network cables supplied with each monitor and subwoofer. You can connect in any order. Just be sure to connect all monitors and subwoofers.

Table 1. Connections on GLM adapter (from left to right).

CONNECTOR	USE
USB (type B)	Connection for a USB cable on your computer. For stand-alone operation, connection from a USB power supply.
Volume (3.5 mm jack)	Connection for Genelec volume controller
Microphone (3.5 mm jack)	Connection for Genelec calibration microphone
GLM Net (RJ45) connection	GLM control network
Terminator (RJ45)	Return termination for the GLM control network from the last monitor, in case of network cabling being greater than 100 meters

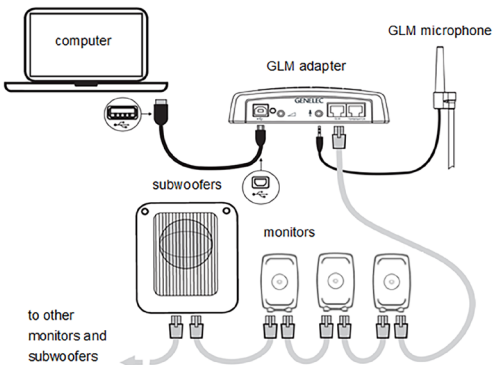


Figure 3. Connections of GLM control network, measurement microphone, and computer.

3.5 DOWNLOADING AND INSTALLING GLM SOFTWARE

The GLM software calibrates and controls Genelec SAM systems. The software can be downloaded at www.genelec.com/glm.

You must have sufficient rights to install the software in your computer. Install the software following the instruction given by the software during the installation process. We recommend you install the software on the local hard drive. There is no need to make any special destination folders, GLM creates these automatically.

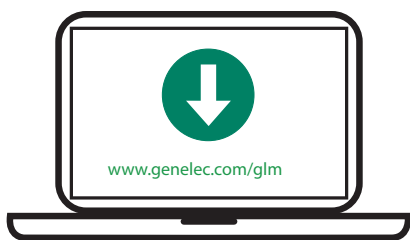


Figure 4. GLM software download

3.6 CREATING SYSTEM LAYOUT AND CALIBRATING

Before launching the GLM software after installation, stop or mute the audio source, ensure that all monitors and subwoofers are connected to the GLM network and are powered on.

The steps to create a GLM System Setup with a system layout and calibration are

1. Create a SAM monitoring system layout.
2. Define SAM monitoring group preset.
3. Run GLM AutoCal automatic calibration.
4. Run GLM AutoPhase automatic phase calibration for subwoofers (AutoPhase is only available when a subwoofer is included in a group).
5. Run GLM WooferCal automatic calibration for woofer

system (Woofers are only available when an adaptive woofer system is included in a group).

For additional groups, repeat steps 2 - 5.

3.7 CREATING SAM MONITOR LAYOUT

To create a layout all monitors, subwoofers and woofer systems must be powered and GLM network connections must be made.

A layout defines your monitors and their locations in the room. Place Left and Right monitor pairs symmetrically to the grid to be able to use the automatic symmetrical room response calibration. Figure 5 shows a stereo system with a subwoofer.

A new system layout is created when the GLM user interface starts the first time. You can always create a new layout by selecting the 'File | New' menu item.

When the creation of a new layout starts, initially all monitors, subwoofers and woofer systems are stacked on the left side of the page.

1. The layout style selection – shows example positions for each system (example positions can be skipped e.g. subwoofer can be placed between Left and Right monitors).
2. The devices – the UnPlaced device cell on the right and the Not Used device cell on the left. Start to drag the device icon from the UnPlaced device cell and the device will play the ID tone. Place the device icon to the Layout grid (3) to the position that matches its placement in your monitoring system layout.
3. The Not Used device cell. This will be used e.g. with the SE System where GLM needs to know the unused channels.
4. The layout grid – the monitoring system layout style with the Stereo with subwoofer system. The center cell is the listening position (will be placed with the VOG monitor in an Auro3D system). The top cells of the grid are the front monitors and the bottom cells are the rear monitors.

5. The monitor already placed to the layout grid.
6. The layout confirmation button – Click to proceed after the layout matches the actual monitoring system layout.
7. The setup process indicator – AutoPhase will be skipped if there is no any subwoofers in use and WooferCal will be skipped if there is no any Woofer systems in use.

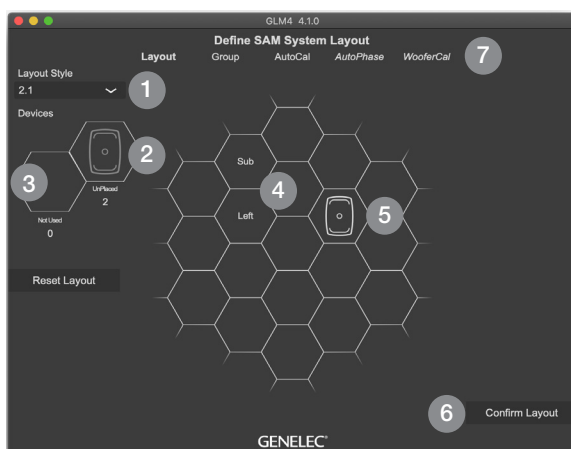


Figure 5. Drag and drop the monitor icons onto the layout grid to build a system layout.

3.8 CREATING GROUP PRESET

A group preset is a set of monitors and subwoofers that reproduce audio together. A group preset contains input and acoustic settings to optimize all monitors and subwoofers active within the group. More group presets can be created to fulfill any need e.g. calibrate system to the another listening position.

To define a monitoring group:

1. Give the group a name that describes it (e.g. Analog Stereo).
2. Optionally you can set the System delay. It will be applied to all monitors and subwoofers in the group.

3. Select and check the bass management crossover frequency required. This setting can be a global if all monitors are to follow the crossover selected. If the setting is an individual, then crossover selections will be done individually for each monitors via a settings popup.
4. Select the Input mode (Digital channel can be changed from the Settings popup by clicking a monitor icon).
5. Settings popup will appear when the monitor icon is clicked.
6. Name the monitor.
7. Make a monitor active or inactive within the group (inactive monitors are indicated by a light gray colour).
8. Select an input.
9. Select active monitors. A light icon indicates inactive monitors within the group state (these will be hidden in other pages). A normal icon indicates active monitors within the group state.
10. Confirm the group settings by clicking on the 'Confirm Group' button.

For more detailed information on using and setting up Groups, see the section 'GLM Advanced Use'.

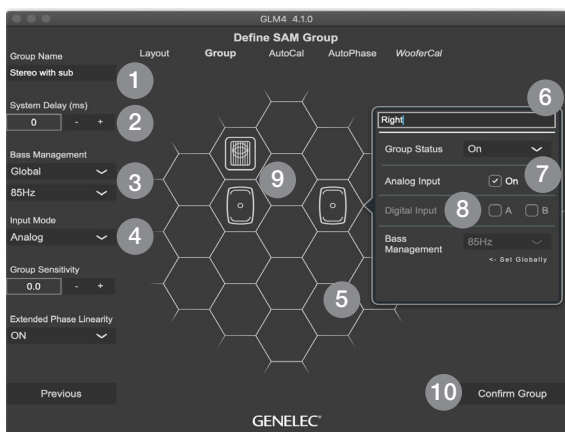


Figure 6. Steps to create a group setting.

3.9 AUTOMATIC CALIBRATION

GLM AutoCal is a powerful monitoring system calibration algorithm running in the Genelec Cloud. Sweeps are generated by each monitor in a group. Responses are recorded with the GLM measurement microphone into your computer.

NOTE: Adaptive Woofer Systems will be calibrated in the WooferCal page after the AutoCal and AutoPhase stages.

The algorithm analyzes the sweeps and calculates the frequency responses for all monitors and subwoofers, then optimizes level and delay to compensate for differences between monitors. It also sets equalization for the individual room responses to remove colorations caused by the room and the location where the monitors have been installed. The end result is to have sound from all monitors arriving at the listening position at the same time, same level, and compensated for the effects of the room acoustics, resulting in very accurate imaging and reliable monitoring.

Each monitor group has its own acoustic settings. This is one of the important features of GLM.

Each setup file can contain several monitoring group preset definitions each with different AutoCal calibration settings.

Even with the same set of monitors you can determine several listening positions by applying calibration in several locations and defining each location as a new group preset. For example, one group can be 'Engineer Position' and another 'Producer Position'. Each can have its own calibration. Then, by selecting the group in the GLM software, it quickly loads all acoustic settings specific for each microphone position.

To calibrate a monitoring group

1. Check the serial number of the measurement microphone (measurement microphone calibration file is retrieved during first calibration)
2. Select the calibration mode; either a single location measurement (SinglePoint) or measurements of multiple measurement positions (MultiPoint). Select the Symmetrical EQ if a Left/Right pair of monitors should receive the same calibration filters. The Individual EQ would be useful for unsymmetrical setups where one monitor is in a corner and the other free-standing. In order for the symmetric filters function to be used, monitors need to be symmetrical on the grid. Monitor pairs not positioned symmetrically on the grid will be handled as individual units.
3. Connect the measurement microphone to the GLM network adapter, place the microphone at the listening position, at ear height, and click on the 'Start Calibration' button to start the measurement and follow the dialog instructions.
 - All monitors and subwoofers will be measured, and if MultiPoint is selected then next position(s) will be measured.
 - Optimization starts.
 - Wait until optimization finishes.
 - The calibration results can be viewed by clicking any loudspeaker icon.
4. Click 'Confirm Calibration' button to accept and save the settings to the setup file.

If there is a subwoofer in the group, the next step of the process is the automatic adjustment of the phase (AutoPhase).



Figure 7. Steps in running the AutoCal automatic system calibration process.

3.10 ALIGNING SUBWOOFER PHASE

The purpose of GLM AutoPhase is to set the subwoofer phase at the crossover frequency, in relation to a selected monitor, so that the combined response of the subwoofer-monitor system is flat across the crossover region. The steps to run AutoPhase automatic subwoofer phase calibration include:

1. Define the monitor to be aligned with the subwoofer by single clicking on the subwoofer icon first and then the monitor icon; this is done for each subwoofer in the group; if there are several subwoofers in the group, associate every subwoofer with a monitor before proceeding to the AutoPhase calibration. The 'Pair' text with number will show the paired subwoofer and monitor.
2. Connect the calibration microphone to the GLM adapter, place the microphone at the listening position, at ear height, and start the AutoPhase measurement process by clicking on the 'Start Calibration' button. Wait until the AutoPhase calibration is completed.

3. Click the 'Confirm Calibration' button to accept and save the calibration to the setup file. If there are several subwoofers in the group, the AutoPhase will move to the next subwoofer automatically.

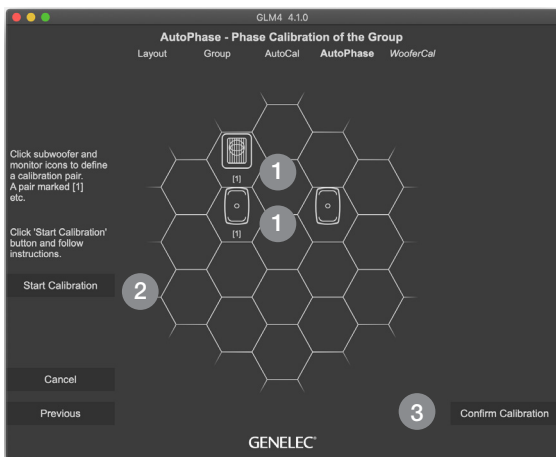


Figure 8. Steps in running the AutoPhase automatic phase calibration process.

3.11 WOOFER SYSTEM CALIBRATION

For a system containing Adaptive Woofer Systems, the first part of the calibration (calibrating the main monitor) is the same as that shown in the Automatic Calibration section (3.9). Once that process has finished (providing woofer systems are active in the group), you will be directed to the woofer system calibration page.

1. The first step is to pair the monitors to the respective woofer systems. This is done by first single-clicking on the woofer system and then single-clicking on the monitor it should be paired with. This process is repeated for all woofer system + monitor pairs in the Group. Once paired, the pairing will continue to other Groups.
2. Firstly, the calibration mode is selected by using the drop-down menu – selecting between Complementary,

- Continued directivity, or one of the three directivity null modes. Each calibration mode or setting will require an individual group to be created.
3. The parameters for setting the search limits for the crossover to the main monitor should then be set. These controls are available for all modes except the Continued directivity mode, where the crossover value is fixed based on the main monitor connected in the pairing. This crossover has been set to where the main monitor and woofer system have the closest matched directivity.
 4. Connect the measurement microphone to the GLM network adapter, place the microphone at the listening position, at ear height, and Click on the 'Start Calibration' button to start the measurement and follow the dialog instructions.
 - All Adaptive Woofer Systems and monitors will be measured.
 - Optimization starts.
 - Wait until optimization finished.
 - The calibration results can be viewed by clicking any loudspeaker icon.
 5. Click 'Confirm Calibration' button to accept and save the calibration to the setup file.

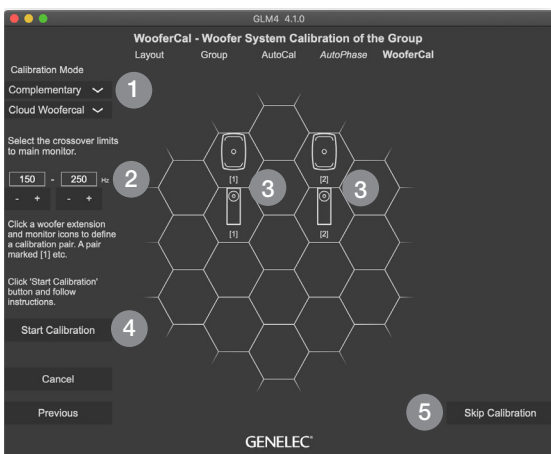


Figure 9. Adaptive woofer system calibration.

3.12 BASIC USE OF GLM

1. System level.
2. Selection and activation of group presets.
3. Mute, mute all.
4. Dim (-20dB).
5. Standard loudness SPL level (calibration from 'Group Preset : Standard Loudness SPL Calibration' menu).
6. Level preset selections (to set adjust the system level at desired level and click 'Group Preset : Set Preset Levels : Set Current Level to Preset1).
7. Bypass BM, will bypass the Bass Management crossover filter. Subwoofers will mute and monitors will play in the full band.
8. The GLM AutoCal status is indicated on the 'Calibrated' button. This button also allows temporary disabling or bypass of the system acoustic calibration settings, by pressing the 'Calibrated' button.
9. Loudspeaker click mode. Select what happens when the loudspeaker icon (10) is clicked in the main page.
 - Solo – Clicked loudspeaker will be soloed and others will be muted. Clicking a muted loudspeaker, it will be also soloed. Clicking a loudspeaker icon multiple times will toggle its state. To clear solo state, click the empty cell or use right click and select 'Play all'.
 - Mute – Clicked loudspeaker will be muted.
 - Info – Clicked loudspeaker information popup will be shown.
 - Edit – Clicked loudspeaker acoustic editor will be shown.
10. The microphone SPL level, shown if the microphone is connected (Z-weighted).
11. The SAM subwoofer and monitor icon. Use the loudspeaker click mode (8) to select what happens when a loudspeaker is clicked.
12. Click the 'Play All' button to turn off all solo and mute states.
13. The currently loaded system setup file and network status.

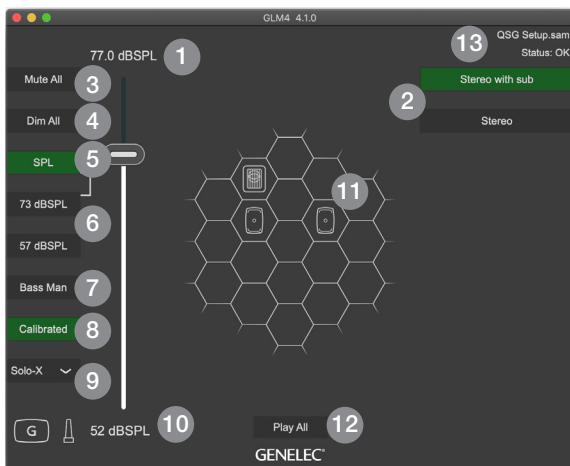


Figure 10. GLM software main page.

4 ADVANCED USE OF GLM

GLM is the most powerful tool available to calibrate and control a Genelec SAM monitoring system. This section introduces the advanced use of the GLM

4.1 IMPORTING GLM3 SETUP

GLM3 Setup file can be imported to GLM4. Import function will import selected GLM3 setup file. GLM3 setup file remains untouched and can be still used with GLM3.

NOTE: GLM4 setup file cannot be opened with GLM3.

Follow these steps:

1. Open GLM4 main page (at least one setup with GLM4 must be created)
2. Click 'File : Import GLM3 Setup...' menu.

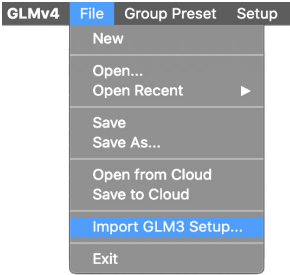


Figure 11. Import GLM3 Setup-menu.

3. Select a GLM3 setup file to be imported and click 'Open'. The imported setup will be stored with the same name to GLM4.

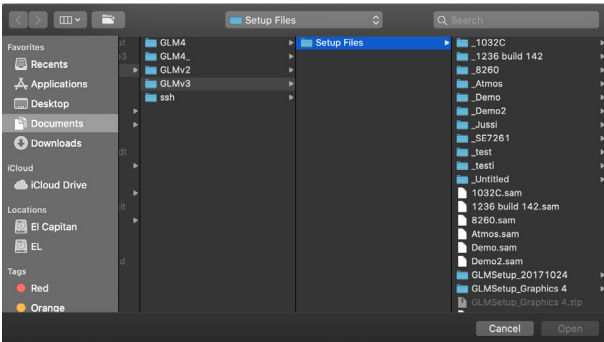


Figure 12. Selecting a setup to be imported from the GLM3 setup folder.

4. The GLM3 file is now imported to GLM4. Settings other than the layout are all kept the same: acoustic settings, groups etc. If there is a need to edit the layout, it can be done by clicking the 'Setup: Edit Layout' menu.

4.2 STANDARD LOUDNESS SPL CALIBRATION

The Standard Loudness SPL feature allows calibration of the listening level in accordance with digital loudness standards such as ATSC A/85 and EBU R128. Calibrated listening level is important to judge speech intelligibility, spectral balance, platform compatibility etc.

The in-situ frequency response compensation and system alignment should be followed by the absolute SPL listening level calibration. Note: Digital monitor interfacing should be used to reduce uncertainty and tolerances.

- Before SPL calibration, first perform the other calibration functions to compensate frequency response, time of flight, level difference between channels and sub phase. You would typically do this by creating a new “Group”, using the Add Group command; or by editing an existing “Group”, using the Edit Group command.
- If you require a frequency response other than flat, for instance an HF roll-off such as x-curve, now make those adjustments. To edit all channels at once, consider using the Sound Character Profiler. Per channel, select and edit individual monitors.
- SPL calibration should be the final item: Click the ‘Group Preset : Standard SPL Calibration’ menu on the main page. The Standard Loudness SPL Calibration window opens.

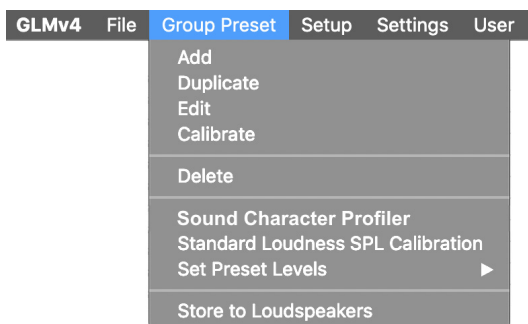


Figure 13. Entering the Standard Loudness SPL Calibration page.

- Select level calibration standard from the dropdown list.
- Place the Genelec calibration microphone at the listening position.
- Click the 'Start Calibration' to start the calibration process. Note that the test signal may be loud. If the background noise in the room is more than 65 dB SPL, the loudness preset cannot be calibrated. Reduce the noise and calibrate again.

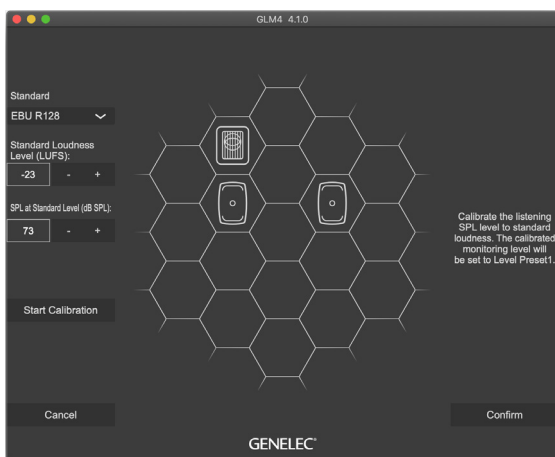


Figure 14. The standard loudness SPL calibration.

- After calibration, click the 'Confirm' key to save the results and return to the main page.

After SPL calibration, the main page shows the preset levels in dB SPL units, and the Level Preset 1 is set at the standard level, e.g. 73 dB SPL for EBU R128. (Notice the graphical link-line between the Cal. Level and Level Preset 1 keys).

To remove the Standard SPL calibration open the calibration page and select 'Remove Calibration' from the Standard list and click the 'Confirm' button.

4.3 SOUND CHARACTER PROFILER TOOL

If you feel the overall spectral balance of your system needs adjustment, i.e. making it generally darker or

brighter, the Sound Character Profiler found in the Group Preset menu is a quick place to start. There are Profiler Presets including the Manual option. Setting the Profiler uses two shelving filters in all monitors in the selected Group.

The Sound Character Profiler tool (SCP) can be accessed via the 'Group Presets | Sound Character Profiler' menu.

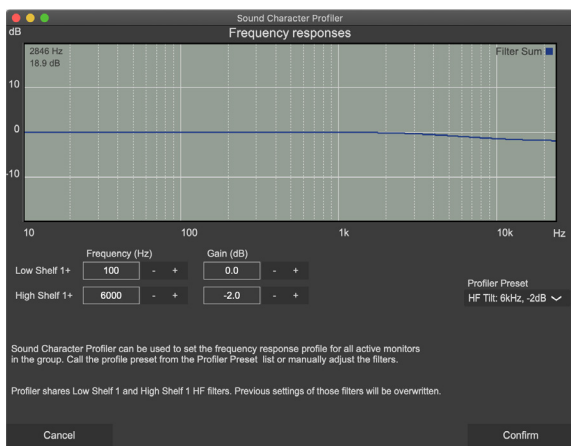


Figure 15. Sound Character Profiler tool.

4.4 STORING VALUES IN MONITORS AND SUBWOOFERS

SAM monitors and subwoofers are set up and calibrated using the GLM control network and the GLM software.

After setup, monitors, subwoofers and the GLM adapter can also operate without having a computer connected to the GLM adapter. This is called stand-alone operation.

SAM monitors and subwoofers retain their settings after storing the settings inside the monitors and subwoofers. In some models there is a 'Stored Controls' switch, which needs to be turned ON to make the monitor use the stored settings in stand-alone mode. The 'Stored Controls' switch status can be seen in the Store Groups Settings page under each monitor (N/A = monitor has no dip switch).

Storing is done with the 'Group Preset: Store to Loudspeakers' menu command.

Settings that are stored; The Current Group Acoustic Settings, Startup Level, ISS Power Saving settings, LED Disable and Input Mode.

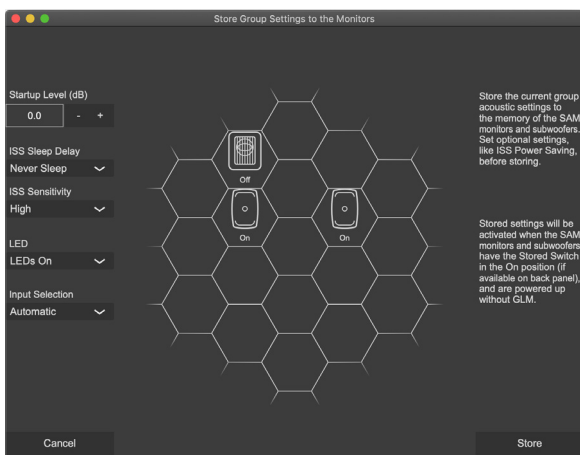


Figure 16. Store Group Settings page

ISS support is not available for the following products: 7260A, 7261A, 7270A, 7271A, 8240A, 8250A, 8260A.

LED Disable and Input Mode support are not available for the following products: 7260A, 7261A, 7270A, 7271A, 8240A, 8250A, 8260A, 8351A, 1238CF, 1237A, 1238A, 1238AC, 1238DF, 1234A, 1234AC, 1236A.

4.5 STATUS INDICATORS

The top right corner shows the system state: 'Status: OK' (all devices are working normally), 'Status: LS Offline' (one or more monitors in this group are not reachable by the network), 'Status: Adapter Offline' (GLM Adapter is not connected to the computer).

The loudspeaker states will be indicated with the following colours (see figure below).

- The loudspeaker icon without any added colour indicates the normal state.
- The loudspeaker icon with the black background indicates the loudspeaker is offline.
- The loudspeaker icon with the red background indicates the loudspeaker is clipping.
- The loudspeaker icon with the yellow background indicates the loudspeaker has protection ON.
- The red border of the loudspeaker cell tells that the loudspeaker is muted.
- The green border of the loudspeaker cell tells that the loudspeaker is soloed.

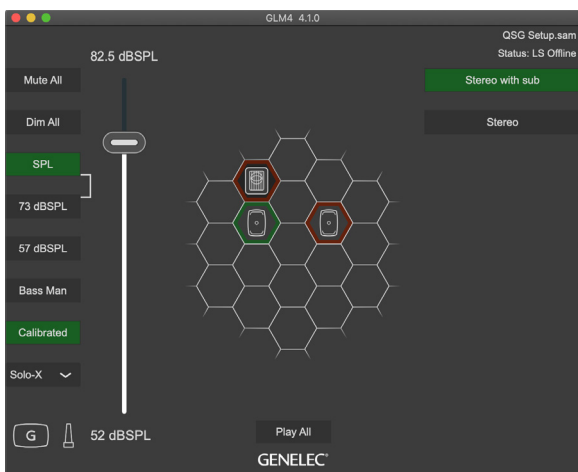


Figure 17. GLM status indicators.

4.6 CLOUD ACCOUNT

GLM's Cloud version requires the user to have an account in the Genelec Community. This can be created at www.community.genelec.com. With a valid user account, log in is then possible from the 'User:Login' menu.

Log in To log in to the Genelec Cloud, enter a valid user name and password on the Genelec Community page.

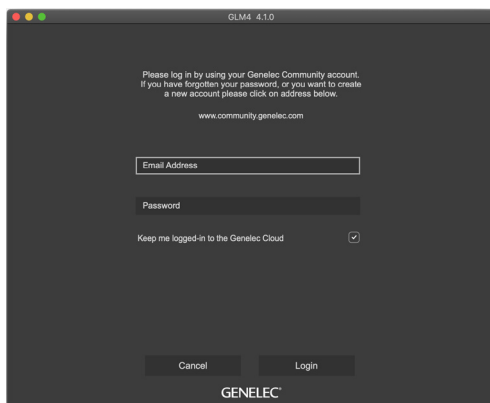


Figure 18. Login to Genelec Community window.

User information / Logout. To logout from the GLM Cloud, click the Logout from User menu.

5 MORE DETAILED INFORMATION

More detailed information is available on the Genelec website and in the individual GLM, monitor and subwoofer operation manuals.

Please visit the GLM product page to download the GLM Operating Manual with detailed information about GLM software www.genelec.com/glm

The SAM studio monitors and subwoofers page at www.genelec.com/sam-studio-monitors-subwoofers enables you to download a detailed Operating Manual for each SAM model, with measurements and detailed monitor performance specifications.

6 SAFETY CONSIDERATIONS

All SAM monitor systems have been designed in accordance with international safety standards. The following warnings and cautions must be observed to ensure safe operating conditions:

- Servicing and adjustment may only be performed by qualified service personnel.
- The monitor/subwoofer must not be opened.
- Do not expose the monitor/subwoofer to water or moisture.
- Do not place objects filled with liquid, such as vases, on the monitor/subwoofer or near it.
- The monitor/subwoofer alone can produce sound pressure levels in excess of 85 dB, which may cause permanent hearing damage.
- Free flow of air behind the monitor/subwoofer is necessary to maintain sufficient cooling. Do not obstruct the airflow around the monitor/subwoofer.
- The monitor is not disconnected from the power supply unless the mains cable is removed from the monitor/subwoofer. Powering down the monitor/subwoofer using its power switch does not disconnect power.
- Ensure that mountings to walls or ceilings for example are able to carry the full weight of the monitor/subwoofer in all circumstances, and the installations have been designed and are implemented according to the local safety regulations and follow principles of good workmanship.
- Genelec products and accessories come with instructions on the proper methods of installation and use. Please follow these instructions.

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