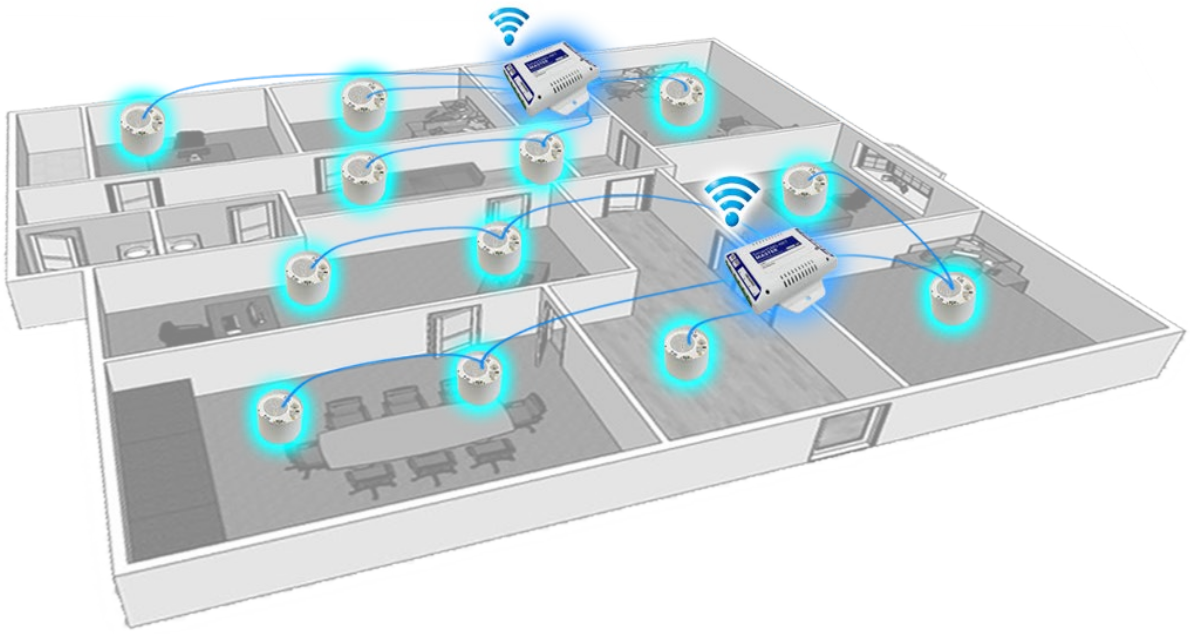
smartSMS-NET

Sound Masking System

Reference Manual

3.2b



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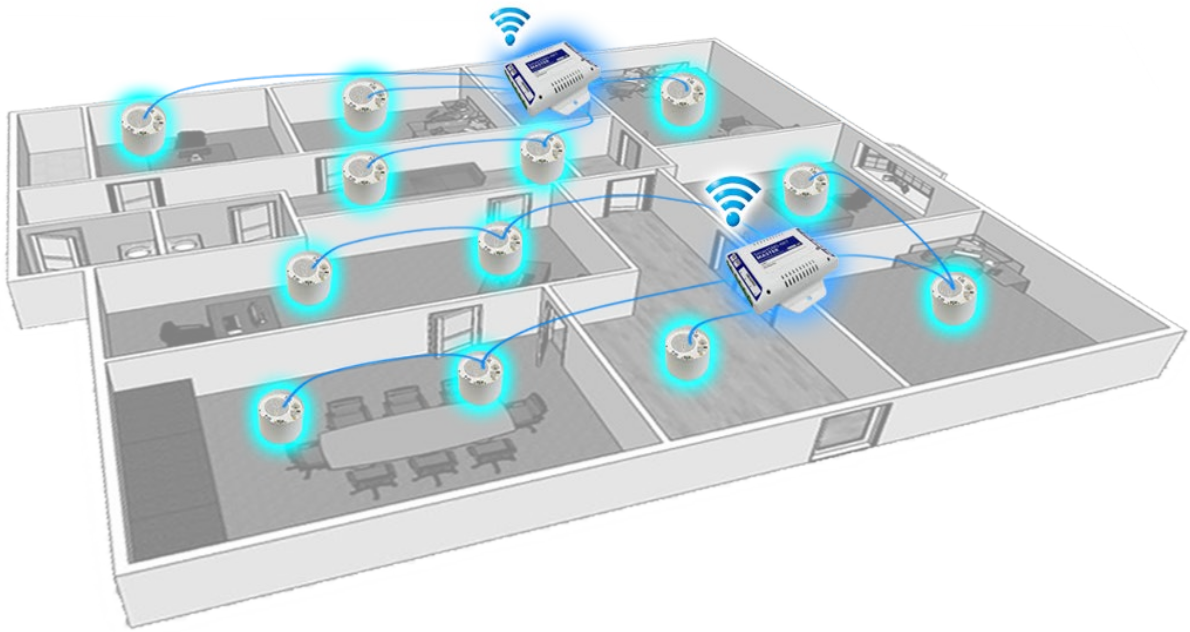
Content

1 Introduction

Appropriate for small projects to the biggest installations, the smartSMS-NET sound masking system is simple and highly versatile, without compromise on sound masking performance and quality.



The smartSMS-NET system

- Offers a decentralized system where many controller units can be networked together to construct large sound masking projects.
- Combines the flexibility of addressable system with the cost-efficiency of centralized systems.
- Uses a wireless network to communicate which allows simplification of the design and reduction of installation costs (no proprietary cables required).
- Implements active volume adjustment, a Soft dB exclusive feature that provides unparalleled comfort and efficiency of the sound masking system (US Patent 8116 461).
- Uses an automatic sound masking calibration that guarantees the optimum sound masking spectra (US Patent 7460 675).
- Offers a state-of-the-art graphical user interface that integrates the design, setup, and calibration stages directly on the layout plan.
- Includes 24/7 monitoring and diagnosis feature (optional).

Each smartSMS-NET controller unit provides:

- True random noise generator (no repetition)
- Up-to 8 independent output channels
- Wideband sound masking equalizers (100 Hz to 6.3 kHz)
  - 340 narrow bands automatic equalizer
  - 19 1/3rd octave bands automatic & manual equalizer
- From 3 to 30 speakers per channel
- Up to 4 auxiliary inputs for music and paging with independent equalizers for each output
- Up to 8 active control sensor inputs
- 2 inputs for wall mount volume control knobs

Certifications - ETL Listed 3191772

- UL 60065 / ULC 60065 – Standard for Audio, Video and Similar Electronic Apparatus – Safety Requirements
- UL 2043 – Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces
- FCC – EN 55103-1&2 – Electromagnetic compatibility-Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use - Part 1: Emissions, Part 2: Immunity

Conform to all ASTM requirements related to Sound masking systems

- ASTM E1374-06 (11) – Standard Guide for Open Office Acoustics and Applicable ASTM Standards
- ASTM E1573-09 – Standard Test Method for Evaluating Masking Sound in Open Office Using A-Weighted and One-Third Octave Band Sound Pressure Levels
- ASTM E1130-08 – Standard Test Method for Objective Measurement of Speech Privacy in Open Offices Using Articulation Index
- ASTM E2638 – Standard Test Method for Objective Measurement of Speech Privacy Provide by Closed Rooms

2 Overview

The smartSMS-NET system offers a flexible approach allowing to create small installations with only a few zones up to large installations with many zones. This flexibility is offered by the smartSMS-NET controllers which are at the heart of the system.

The smartSMS-NET system offers a wide range of controllers ranging from small low-power 2-channel units to high-power 8-channel units. These controllers can be networked together to create a scalable system appropriate for small to large projects.

The smartSMS-NET Project Manager software is an essential element of the system. It allows to create, manage and operate the smartSMS-NET system. This software is extensively described in this user manual. For more information on the Project Manager Software download and installation, refer to Appendix B smartSMS-NET Project Manager Software Installation, p. 99.

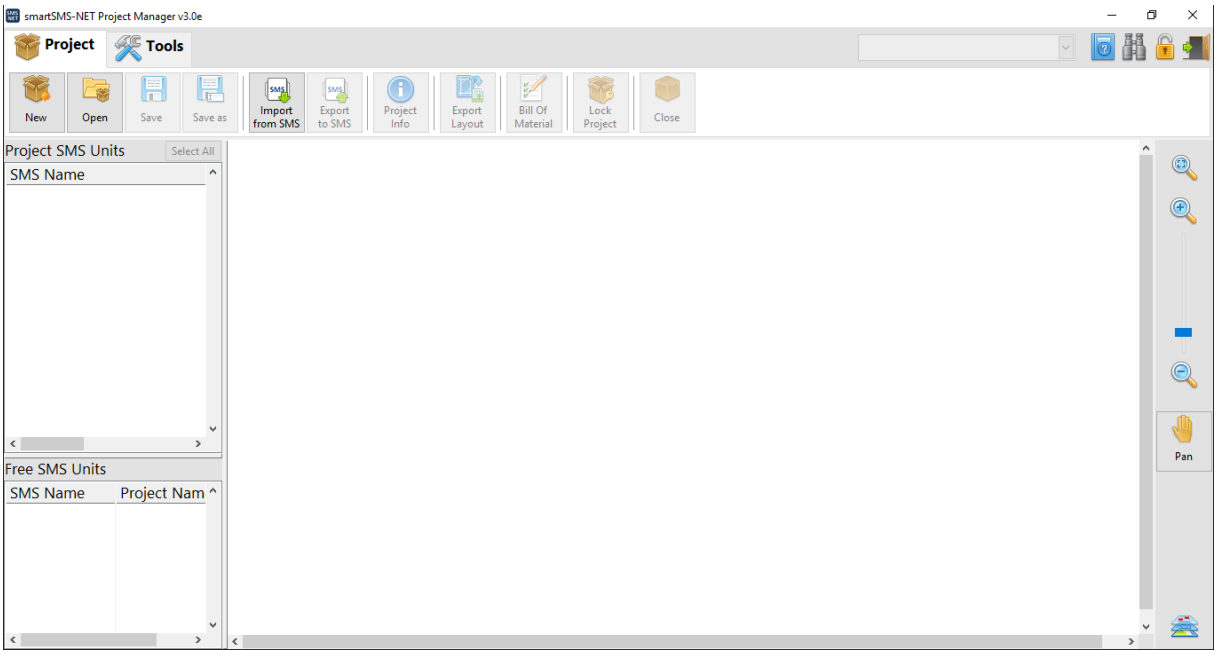
The following sections of this user manual describe in details how to create, manage and operate a smartSMS-NET sound masking system:

1) Create a smartSMS-NET project using the Project Manager software (p. 4)
2) Edit the project layout; import background image, place loudspeakers, place smartSMS-NET units, add wiring, etc. (p. 5)
3) Link the smartSMS-NET controller units to the project (p. 20)
4) Install the system components on-site (p. 23)
5) Install communication network (p. 42)
6) Set-up system parameters; calibrate sound masking, set-up music and paging, etc. (p. 45)
7) Implement system monitoring (optional) (p. 83)
8) Implement an end-user control panel (p. 85)

3 Create a Project

The smartSMS-NET projects are software files integrating the layout and parameters of the system. Hence, the first step in any smartSMS-NET system installation is to create a smartSMS-NET project.

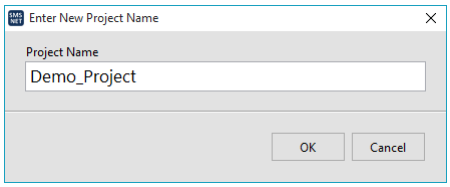
Launch the Project Manager software from the Start Menu.



The Project Manager software contains all the functions to create, edit, commission and operate a smartSMS-NET system.

1) Click on the 

button to create a new project. This will launch the new project name prompt.



2) Enter the new project name in the text field.

Note: The project name is limited to 24 characters and must not contain certain characters like spaces or slash "/".

4 Edit Project Layout

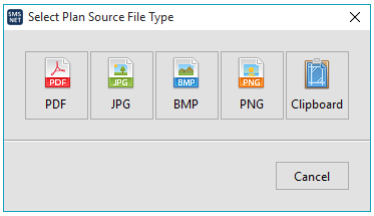
Once a project is created, the project layout needs to be laid down. The layout is the schematic view of the project; it displays the layout of zones, speakers, smartSMS-NET controller units, etc.

4.1 Import a Background Image

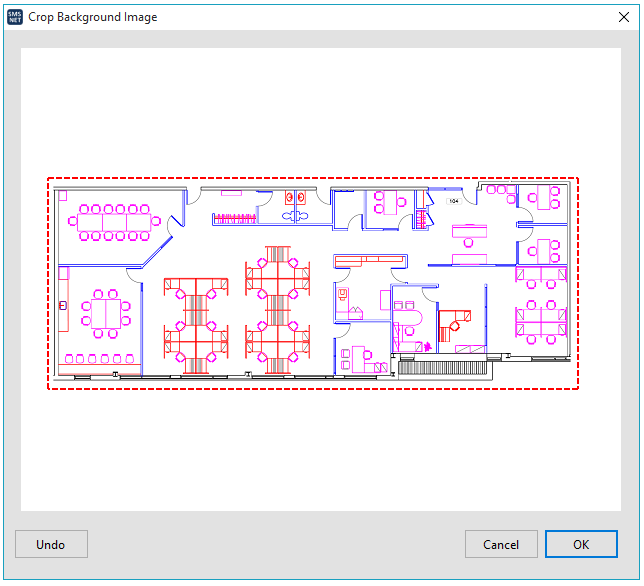
It is recommended to import a background image to the layout to make it easier to interpret and use.

1) Click on the 

button to import background image.

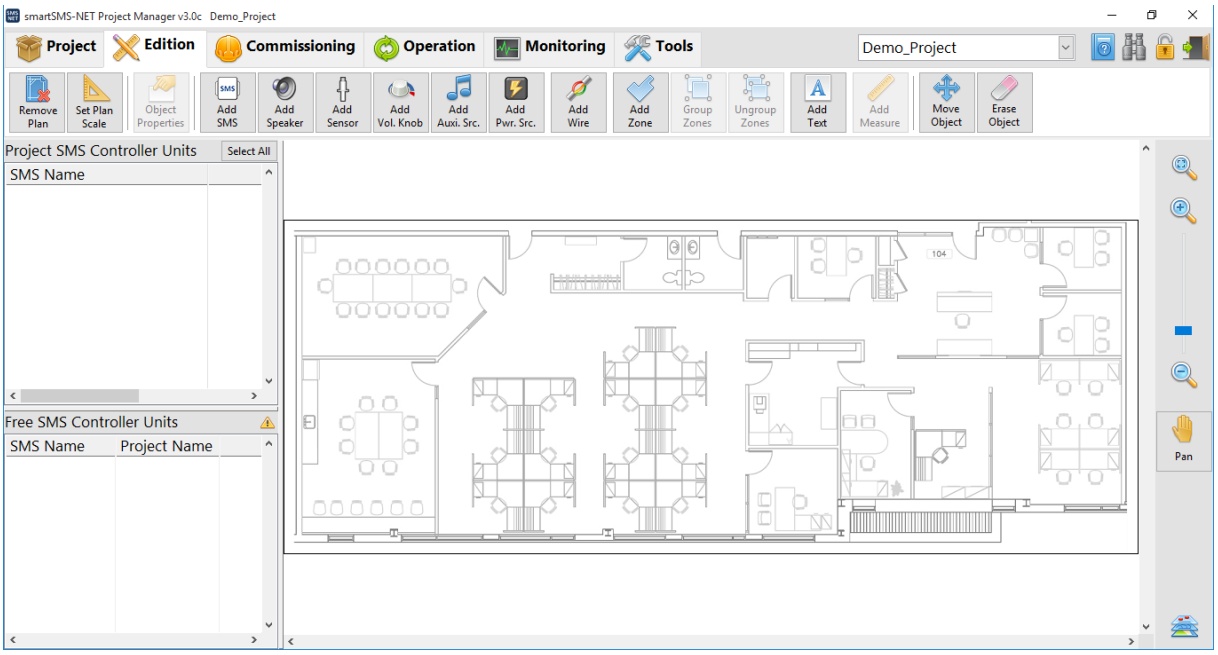


2) Select the appropriate file type from the available image types.
3) Browse for the correct file in the browser window and click “OK”.
4) On the preview window, you can crop the image if needed (click on the first corner and drag to the second to define the crop frame (red dot line))



5) Click “OK” on the preview window to confirm

After these steps, the background image will be loaded in the project and it will be displayed in the layout section of the interface:

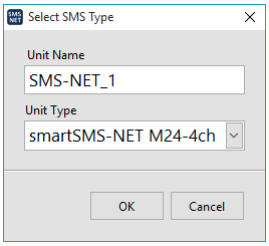


4.2 Add smartSMS-NET Controller Units

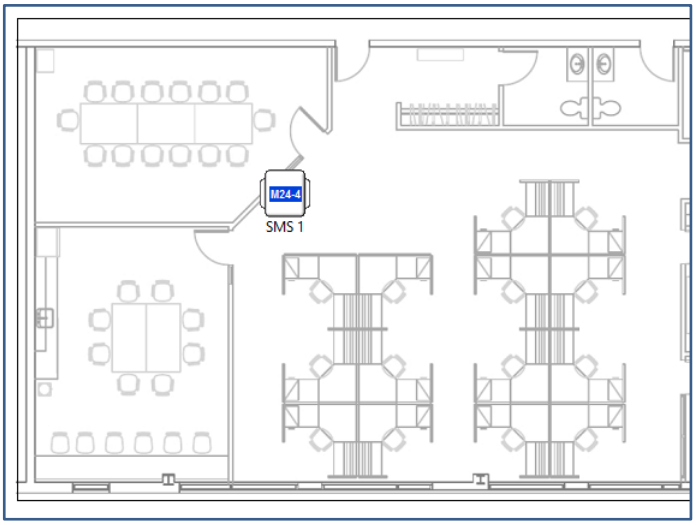
Once the background image is imported, you can add smartSMS-NET controller units on the layout. The smartSMS-NET controller units are the core of the system.

1) Click on the 

button to add a smartSMS-NET controller unit on the layout.
2) With the "Add SMS"  tool selected, click on the layout to add a smartSMS-NET controller unit at the desired location.
3) When the position is selected on the layout, a prompt will request the following information:
   - Unit name (identifier)
   - Unit type (M24-4ch, S24-4ch, S12-2ch, S12-4ch, R120-4ch, ML48-8ch, RL200-8ch, or RL120-4ch)
4) Click "OK" to confirm the information



5) The "Add SMS" tool keeps being active so other smartSMS-NET controller units can be added immediately.



Note: Should you want to change the properties of the smartSMS-NET unit (name or model), select the smartSMS-NET unit on the layout and click on the 

button.

Note: The first smartSMS-NET controller unit to put on the layout is the Master Unit. The Master Unit holds the global configuration, because every other unit refers to the Master, it's necessary to make it the first one in the project. The Master Unit must be an M24-4ch, M12-4ch, R120-4ch, ML48-8ch or RL200-8ch model.

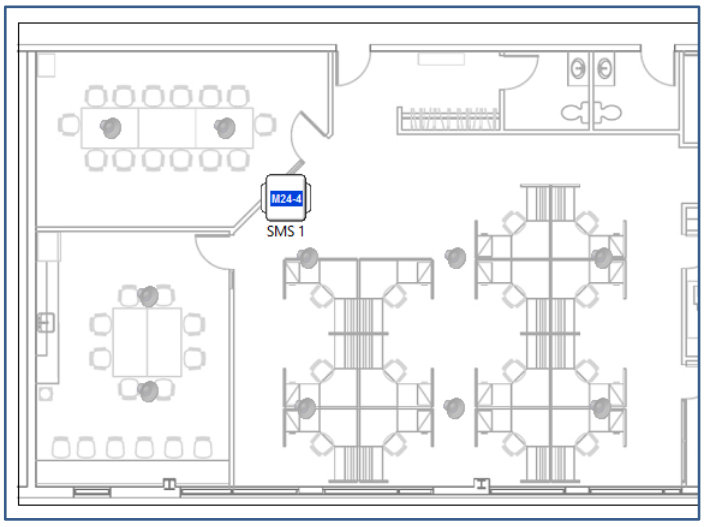
For more information on different smartSMS-NET controller models, refer to section 6.2 Install smartSMS-NET Controller Units, p. 24.

4.3 Add Loudspeakers

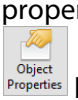
Once the smartSMS-NET controller units are added on the layout, you can add loudspeakers to it.

1) Click on the 

button to add a loudspeaker on the layout.
2) With the "Add Loudspeaker"  tool selected, click on the layout to add a loudspeaker at the desired location.
3) The "Add Loudspeaker" tool keeps being active so other loudspeakers can be added immediately.



Note: When loudspeakers are not yet connected with wires, they appear gray. The gray overlay will disappear as soon as they get connected to a smartSMS-NET controller unit with wiring.

Note: Should you want to change the properties of a speaker (type, color, tap, etc.), select the speaker(s) on the layout and click on the 

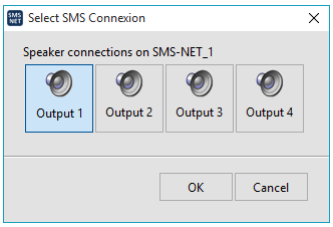
button.

4.4 Add Wires

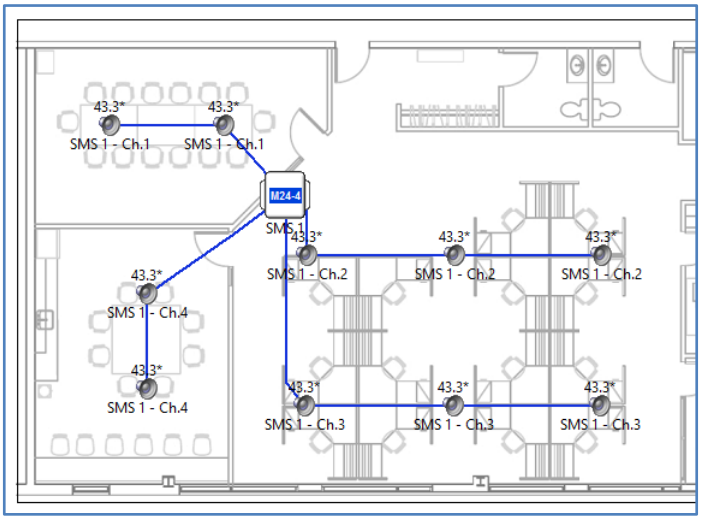
Now that smartSMS-NET controller units and loudspeakers are on the layout, they need to be connected together using wires.

1) Click on the 

button to add wiring on the layout.
2) With the "Add wire"  tool selected, click on a loudspeaker to start a wire connection.
3) Click on another speaker or on the smartSMS-NET controller unit to connect the other end of the cable. When clicking on a smartSMS-NET controller unit, a prompt interface will ask for appropriate connection to the smartSMS-NET controller unit connectors:



4) Select the appropriate connection for the smartSMS-NET controller unit and click "OK".



Note: Hold "Ctrl" to draw horizontal or vertical cable lines.

Some restrictions apply to the number of speakers to be connected to an output, see section 6.2 Install smartSMS-NET Controller Units, p. 24 for more information.

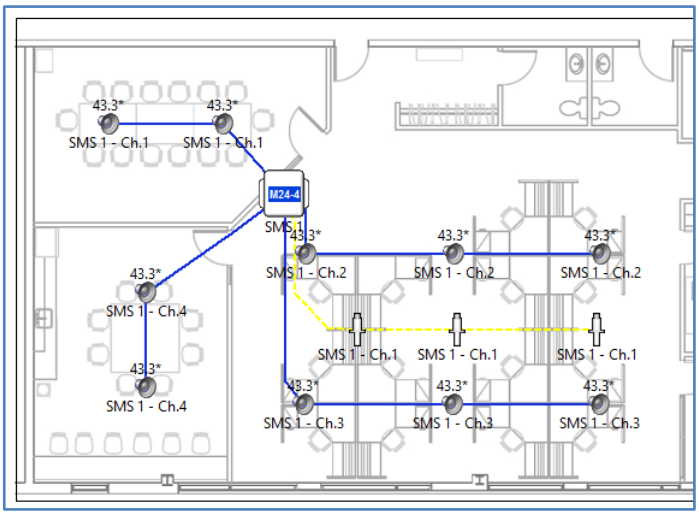
4.5 Add Active Volume Control Sensors

Active volume control allows adjusting automatically the sound masking volume using noise sensors. When noise activity is high (noisy) the sound masking volume will be higher and when noise activity is low (quiet) the sound masking volume will be lower.

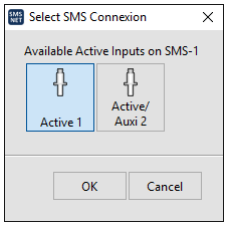
For more information on active volume control, refer to Appendix C Sound Masking Active Volume Control, p. 103. Up to 6 sensors can be connected in parallel. Refer to section 6.4 Install Active Volume Control Sensors, p. 39, for more information.

1) Click on the 

button to add an active volume control sensor on the layout.
2) With the "Add sensor"  tool selected, click on the layout to add a sensor.
3) Add a wire from the sensor to the smartSMS-NET controller unit.



Upon clicking on the smartSMS-NET controller unit to connect the end of the wire, the connection interface will display the available inputs. Note that if some inputs are already connected to a sensor line, they will not be available in the connection interface.



Note: When using a shared input (active/auxi), the connected cable will determine the input type to be used. Refer to section 8.10, Input Type Selection, p. 75 for more info.

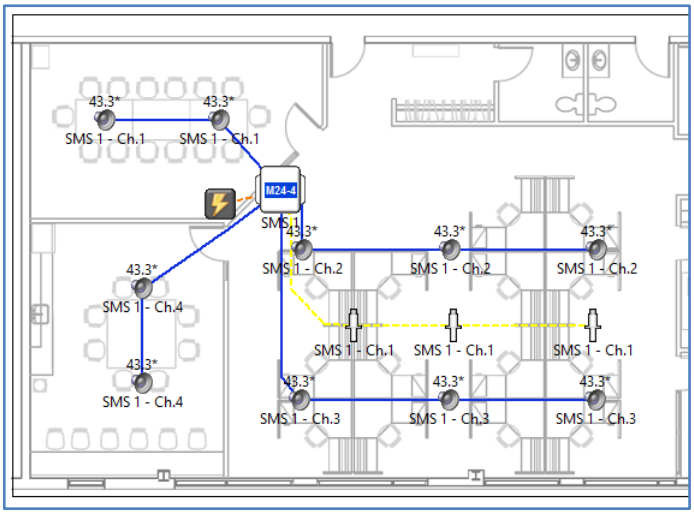
4.6 Add Power-Supply Units

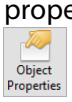
The smartSMS-NET controller units require a 24V power-supply to work. However, it is not required to include it on the layout but it is a good practice to do so to document the project and help installers.

Many smartSMS-NET controller units can be powered with a single power-supply. Some limitation applies; refer to section 6.2 Install smartSMS-NET Controller Units, p. 24 for more information.

1) Click on the 

button to add a power-supply unit on the layout.
2) With the "Add power-supply"  tool selected, click on the layout to add a power-supply unit.
3) Add a wire from the power-supply to the smartSMS-NET controller unit.



Note: Should you want to change the properties of a power-supply (type), select the power-supply(ies) on the layout and click on the 

button.

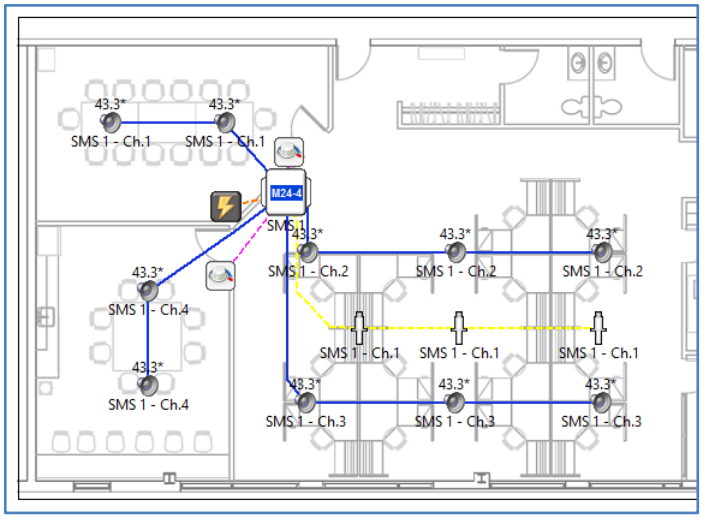
4.7 Add Volume Control Knobs

Wall mounted volume control knobs can be connected to the smartSMS-NET controller unit to allow a manual adjustment of the sound masking (and/or music) volume.

A volume control knob can only be connected to one smartSMS-NET controller nit. Refer to section 6.5 Install Volume Control Knobs, p. 40 for more information.

1) Click on the 

button from the Edition Tab to add a volume control knob on the plan layout.
2) With the "Add knob"  tool selected, click on the layout to add a volume control knob.
3) Add a wire from the volume control knob to the smartSMS-NET controller unit.

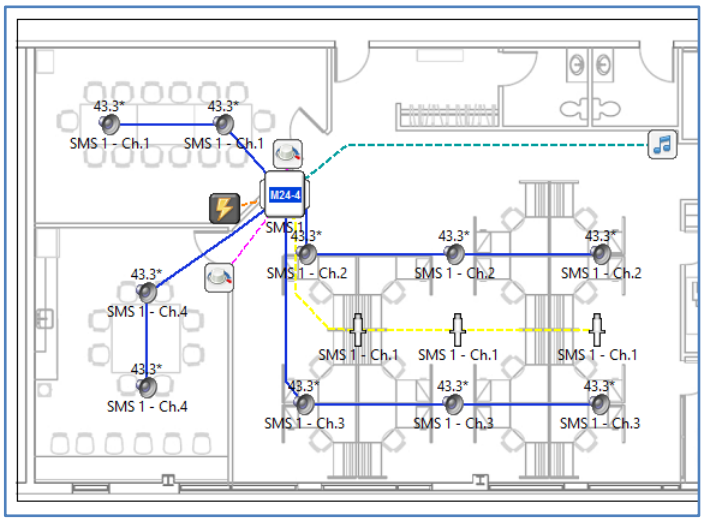


4.8 Add Music and Paging Sources

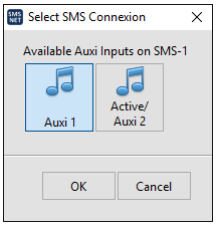
It is possible to play music and make public announcements on the smartSMS-NET system. An auxiliary source can be connected to many smartSMS-NET controller units. See section 6.6 Install Music and Paging, p. 41 for more information.

1) Click on the 

button to add a Music/Paging source on the layout.
2) With the "Add Auxi."  tool selected, click on the layout to add a Music/Paging source.
3) Add a wire from the Music/Paging source to the smartSMS-NET unit.



Upon clicking on the smartSMS-NET controller unit to connect the end of the wire, the connection interface will display the available inputs. Note that if some inputs are already connected to an audio source, they will not be available in the connection interface.



Note: When using a shared input (active/auxi), the connected cable will determine the input type to be used. Refer to section 8.10, Input Type Selection, p. 75 for more info.

Note: Should you want to change the properties of an auxiliary source (music vs paging), select the auxiliary source(s) on the layout and click on the 

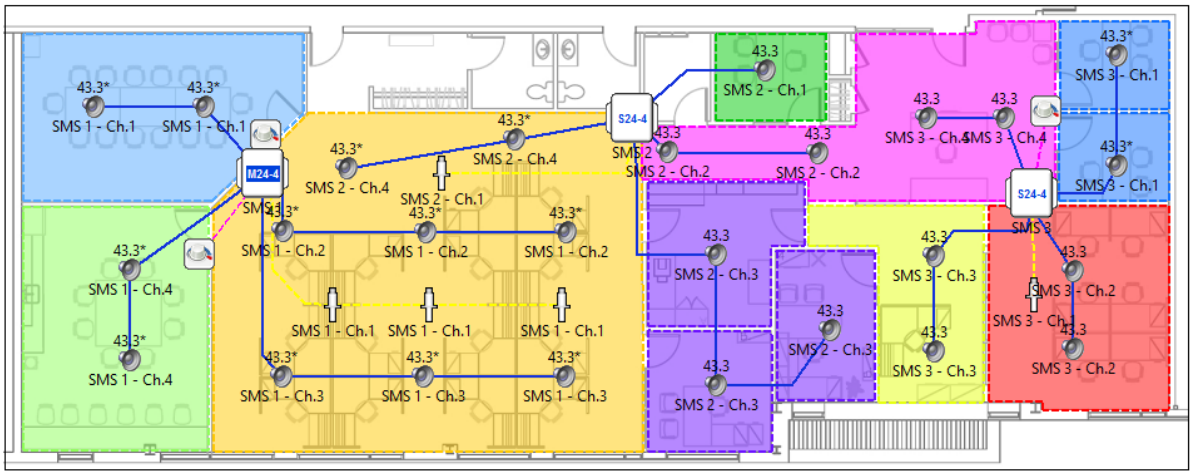
button.

4.9 Create Zones

Zones are areas of similar sound masking environment. Zones can include from one speaker line to several speaker lines from many smartSMS-NET controller units.

1) Click on the 

button to add a zone on the layout.
2) With the "Add Zone"  tool selected, click on the plan layout to draw the zone contour.
3) Click on the starting point to close the zone.



Note: A speaker line can't be divided between two zones. In other words, there can't be one speaker in Zone A and one speaker in Zone B from the same speaker line.

Should you want to change the properties of a zone (name, color, transparency, etc.), select the zone(s) on the layout and click on the 

button.

Zones can be grouped or ungrouped using the 

and the 

buttons.

Note: Hold "Ctrl" to draw horizontal or vertical zone lines.

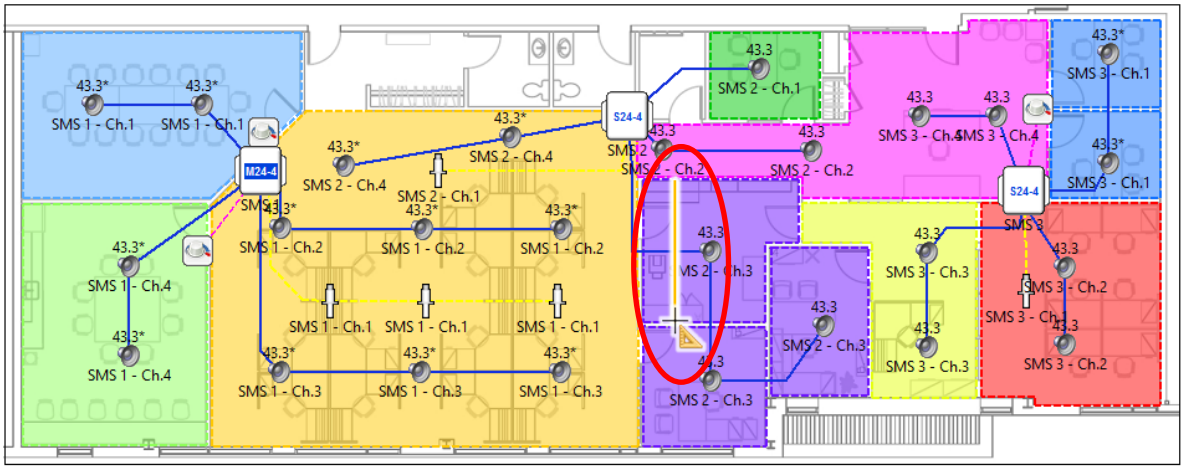
4.10 Set Layout Scale

It is recommended to set the layout scale in order to use all the features of the Project Manager software. The features requiring appropriate scale definition includes zone area calculation, wire length estimation, measure lines, etc.

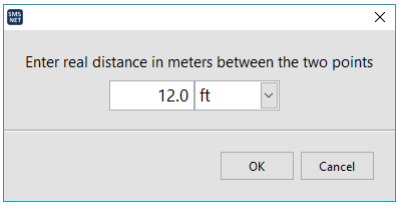
1) Click on the 

button to set the plan scale.

2) With the "Set Scale"  tool selected, click on the plan layout to draw a line between two points between which you know the real distance in meters or feet.



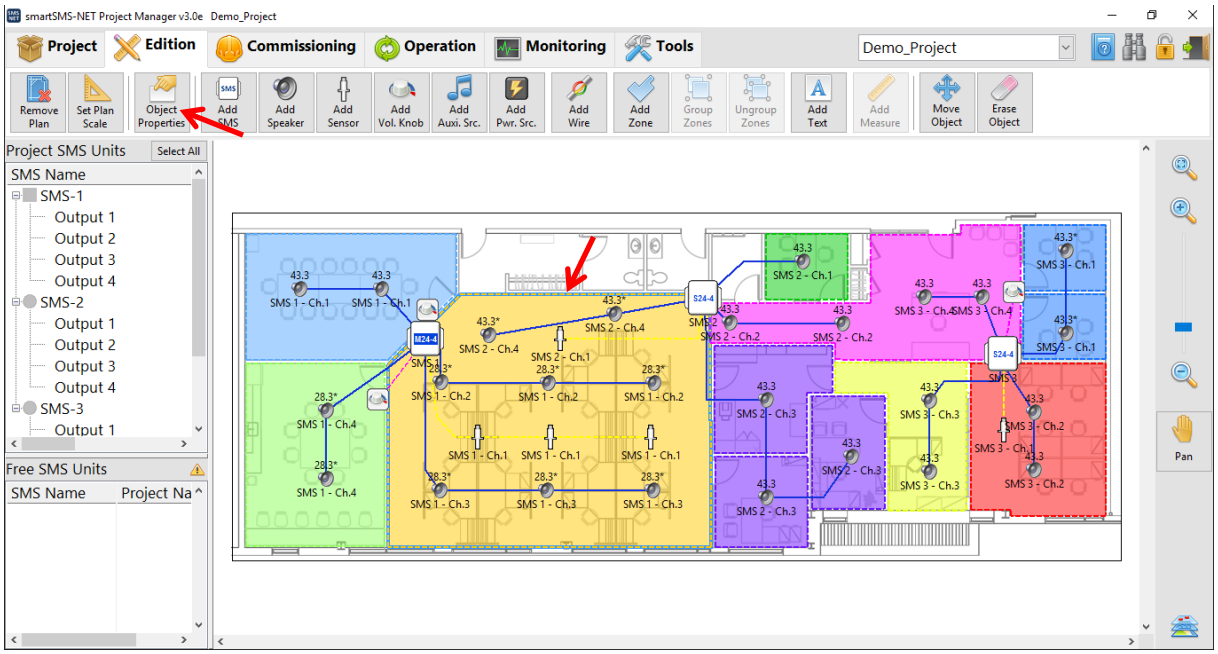
3) Enter the real distance between the two points in meters or feet.



4.11 Analyze Zone Coverage

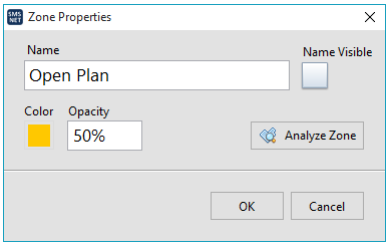
A zone can be analyzed for appropriate sound masking coverage. The coverage quality is defined by the distance from each speaker to the other and by the zone acoustical environment. For example, surface speakers must be closer to each other than plenum speakers to avoid getting noticeable “hot-spots”.

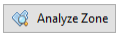
1) Select a zone on the layout.



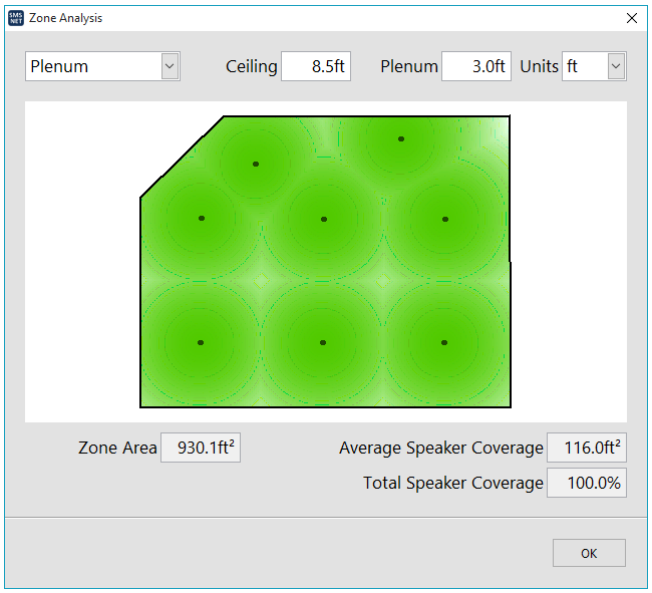
2) Click on the 

button to open the Zone Properties interface.



3) Click on the 

button to access the Zone Analysis interface.



The top controls allow to define the acoustical environment and the bottom indicators show the result of the analysis.

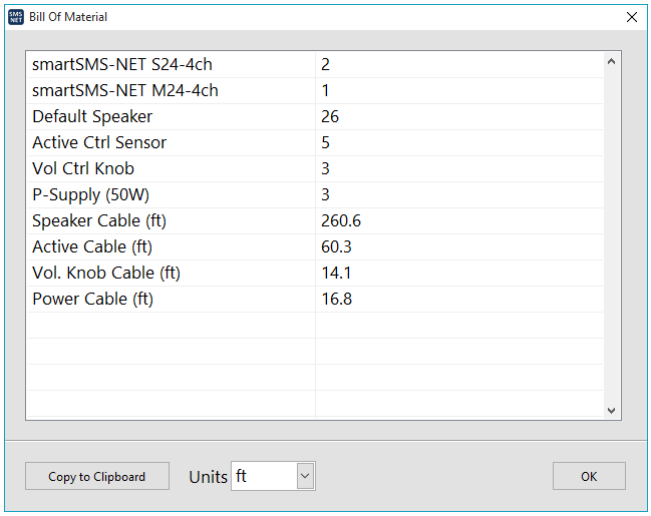
The "Total Speaker Coverage" should be 100% of the zone area. If the "Speaker Coverage" is less than 100%, the zone image will show white areas meaning insufficient coverage. When this occurs, it's recommended to increase the speaker density over the zone surface.

The "Average Speaker Coverage" indicates the average area covered by each loudspeaker.

4.12 List System Components

Once the layout is finished, the list of components (Bill of Material, or BOM) can be displayed. Click on the 

button from the Project toolbar to access the Bill of Material:



Note: Wire quantity is a rough estimate based on the layout scale and layout wire length. A more appropriate estimate of the needed cable length would be to double this quantity.

4.13 Export Layout Image

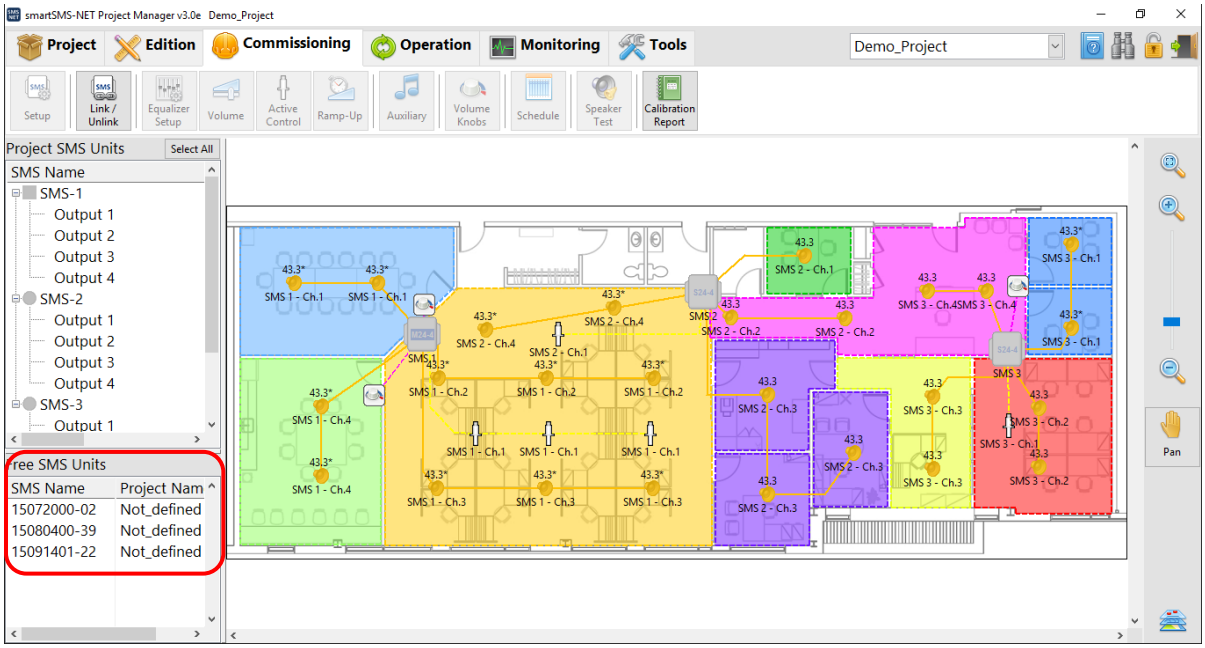
The layout image can be exported using the 

button from the Project toolbar. This function exports the image as a *.png file which can be used in a Word document or sent in an email.

5 Link smartSMS-NET Controller Units to the Project

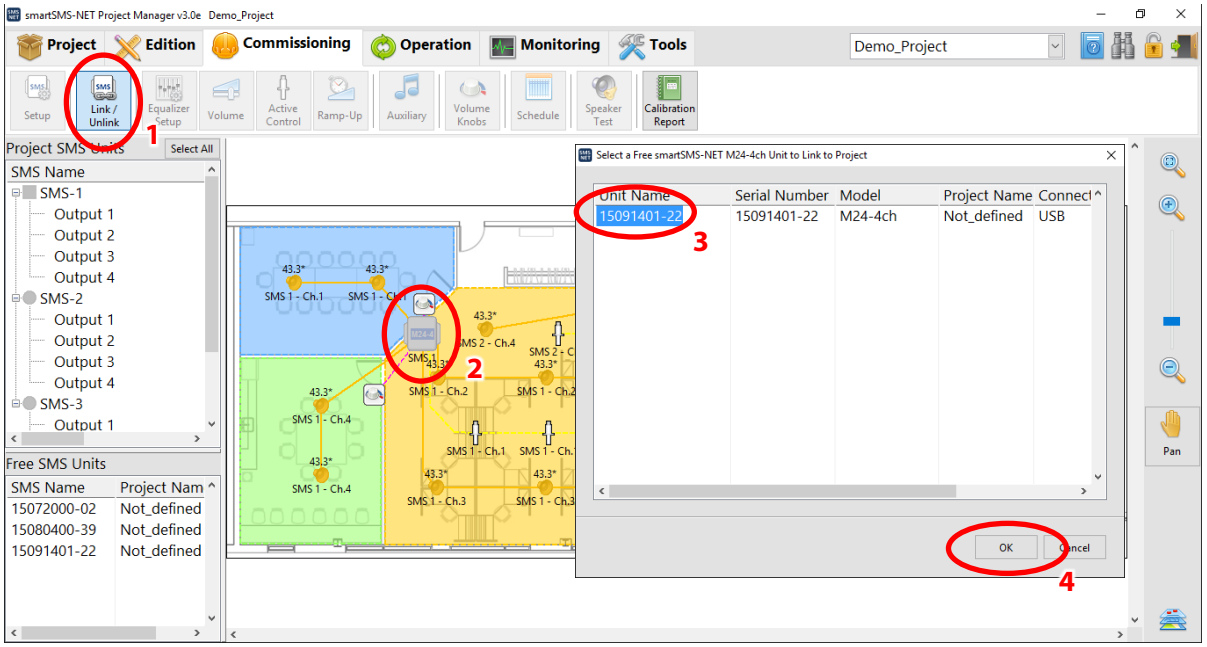
Subsequent to project edition and before commissioning the system, it is necessary to link real smartSMS-NET controller units to their virtual alias in the software. In order to do so, follow these steps:

1) Connect the smartSMS-NET controller unit(s) to the computer using a USB cable, Wi-Fi or Ethernet. The connected controller units should appear in the "Free SMS Units" list on the lower left corner of the main interface.

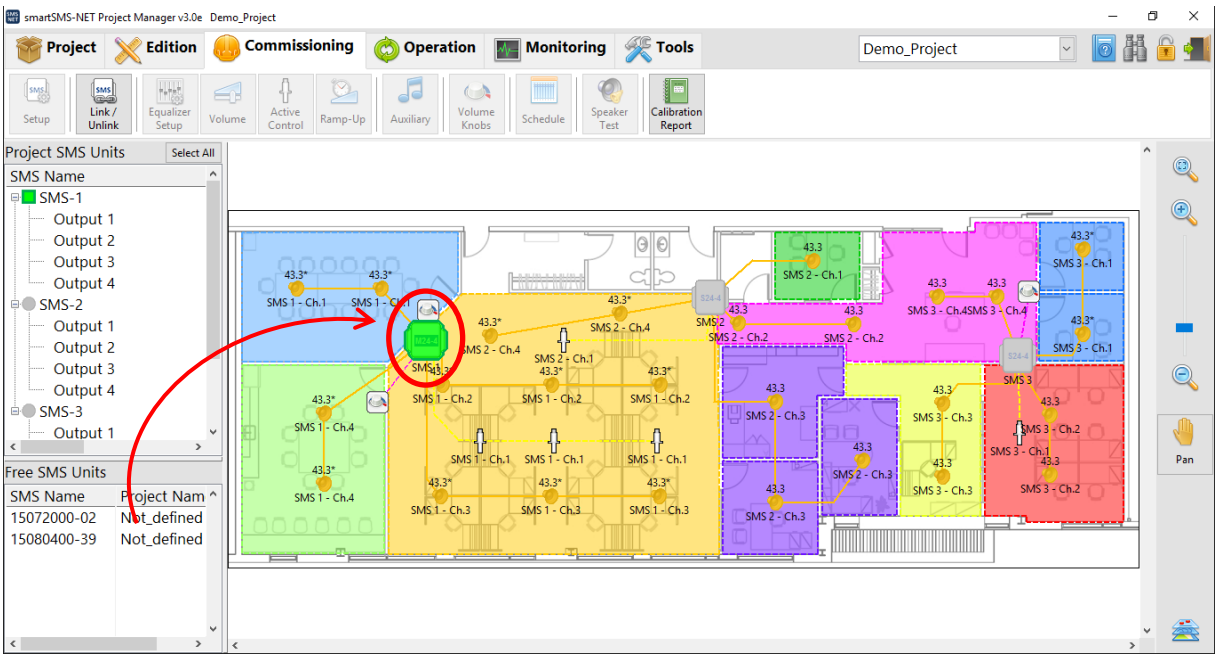


2) Click on the  button to select the "Link SMS" tool.

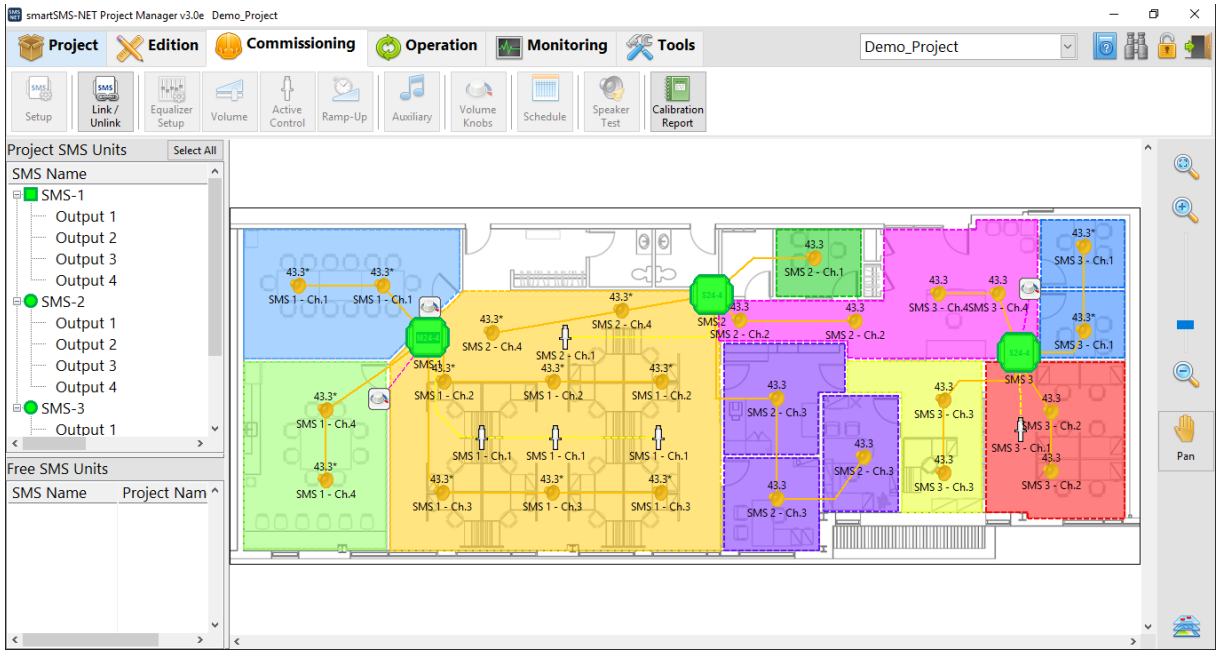
3) With the "Link SMS"  tool selected, click on a smartSMS-NET controller unit on the layout to identify the target smartSMS-NET controller unit. This will display a list of detected and available smartSMS-NET controller units that fit the model of the target unit.
   - The first unit to be linked is the Master unit.
   - The unit model must match the model of the software alias in order to be linked. In other words, M24 types can only be linked to a M24 alias, S24 with S24, etc.
4) Select the available smartSMS-NET controller unit from the list and click "OK". This operation will link the physical smartSMS-NET controller unit to its alias in the software.



Following this process, the smartSMS-NET controller unit should be synchronized with the project and its icon should turn green indicating that the unit is synchronized and updated. Note that the selected unit is not visible anymore in the "Free SMS Units" list because it's now linked to the current project.



Repeat the process until all the controller units are linked:



6 Install System Components

Now that the smartSMS-NET project is created, the project layout is established and the smartSMS-NET controller units are linked, the system components needs to be installed on site.

6.1 Important Safety Instructions

- Read and keep these instructions.
- Heed all warnings and follow all instructions contained within this manual.
- Install in accordance with the manufacturer's instructions.
- Clean only with dry cloth.
- Do not install near water.
- Do not block any ventilation openings.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Use the power cord with sealed mains plug appropriate for your local main supply as provided with the equipment. If the provided plug does not fit into you outlet contact the manufacturer.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments and accessories specified by the manufacturer.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- Operate the product only with the voltage specified on the unit. Fire and/or electric shock may result if a higher voltage is used.
- Do not modify, kink, or cut the power cord. Do not place the power cord in close proximity to heaters and do not place heavy objects on the power cord and/or the product itself, doing so may result in fire or electrical shock.
- Be sure the installation of this product is stable, avoid slanted surfaces as the product may fall and cause injury, property damage, electrocution and/or fire.
- Do not open the cover.

6.2 Install smartSMS-NET Controller Units

There are multiple controller configurations available, from small plenum mount low-power 2-channels units up to high-power rack-mount 8-channels units. The table on next page shows the differences between the controllers. Many controllers of different types can be used together to create large projects.

Controller Model	M24-4ch	S24-4ch	M12-2ch	S12-4ch	R120-4ch	ML48-8ch	SL48-8ch	SL24-8ch	ML24-4ch	SL24-4ch	RL200-8ch	RL120-4ch	RLCTL-8ch
Picture													
Output Channels	4	4	2	4	4	8	8	8	4	4	8	4	8
Max Speakers/Channel	6	6	6	3	30	6	6	3	6	6	30	30	75[3]
Max Spkrs./Controller	24	24	12	12	120	48	48	24	24	24	200	120	600
Active Vol. Ctrl. Inputs[1]	2 (1 shared)	2 (1 shared)	2 (1 shared)	2 (1 shared)	2	8 (4 shared)	8 (4 shared)	8 (4 shared)	4 (4 shared)	4 (4 shared)	8 (4 shared)	4	8 (4 shared)
Music/Paging Inputs[1]	2 (1 shared)	2 (1 shared)	2 (1 shared)	2 (1 shared)	2	4 (4 shared)	4 (4 shared)	4 (4 shared)	4 (4 shared)	4 (4 shared)	4 (4 shared)	4	4 (4 shared)
Volume Ctrl. Inputs	2	2	2	2	2	2	2	2	2	2	2	2	2
USB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wifi[2]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ethernet	×	×	×	×	×	✓	✓	✓	✓	✓	✓	✓	✓
Form Factor	Mini-Plenum	Mini-Plenum	Mini-Plenum	Mini-Plenum	Rack-Mount	Mini-Plenum	Mini-Plenum	Mini-Plenum	Mini-Plenum	Mini-Plenum	Rack-Mount	Rack-Mount	Rack-Mount
Max Power	15W	15W	15W	15W	90W	30W	30W	30W	15W	15W	150W	90W	15W
Can be a Project Master?	YES	NO	YES	NO	YES	YES	NO	NO	YES	NO	YES	YES	YES
On-Board Real-Time Clock	Optional	Optional	Optional	Optional	Optional	Included	Included	Included	Included	Included	Included	Included	Included

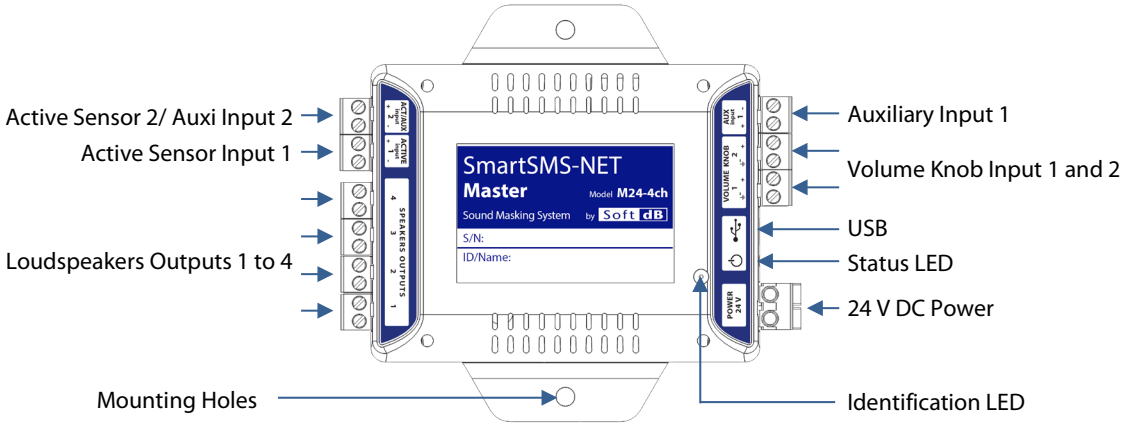
1: A shared input can be an active volume control sensor input OR a paging/music input.

2: Wifi module can be disabled if it's not required

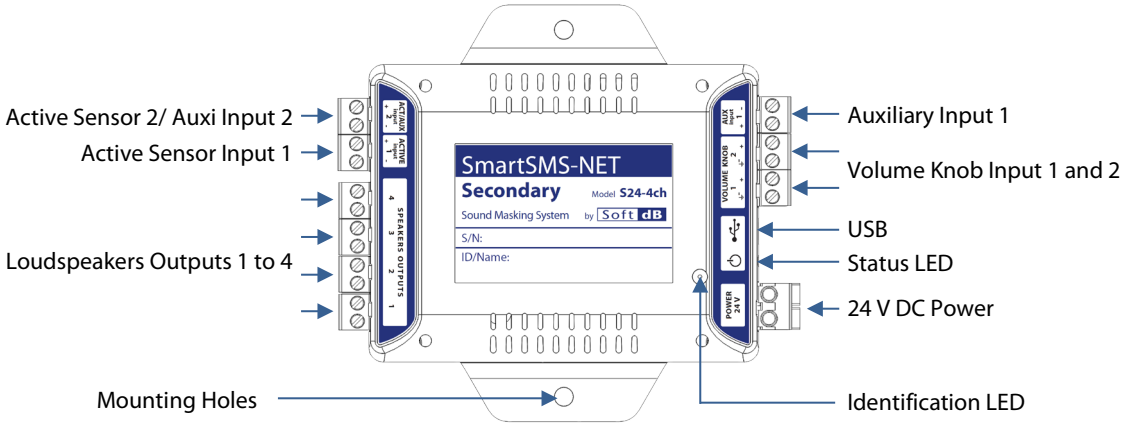
3: The RLCTL-8ch does not include power amplifiers. An external audio amplifier must be used in conjunction with the RLCTL-8ch to drive loudspeakers. A maximum of 75 loudspeakers is recommended to avoid large uneven zones.

6.2.1 Controller Units Connections

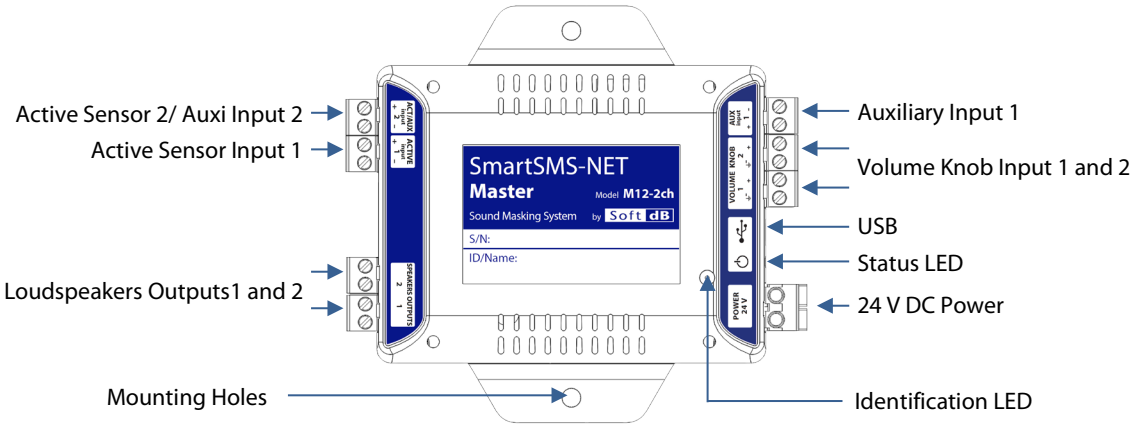
M24-4ch



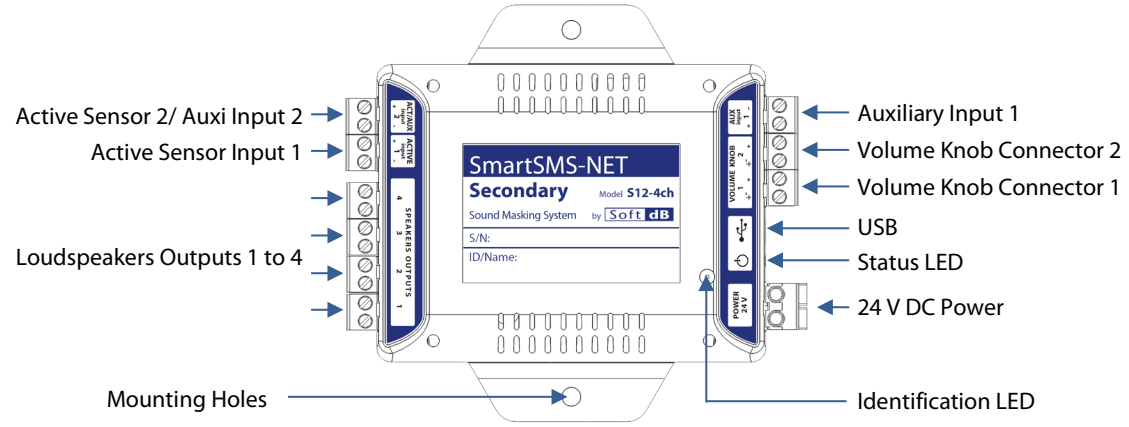
S24-4ch



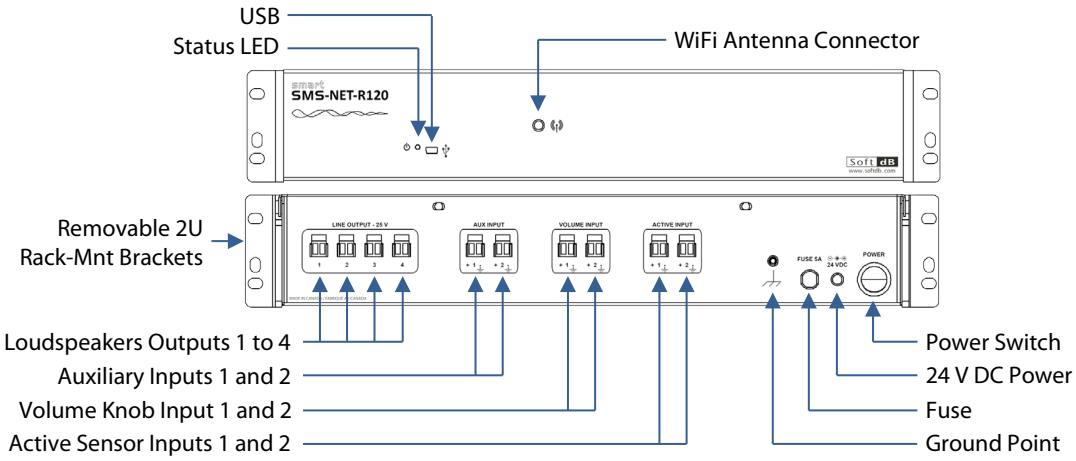
M12-2ch



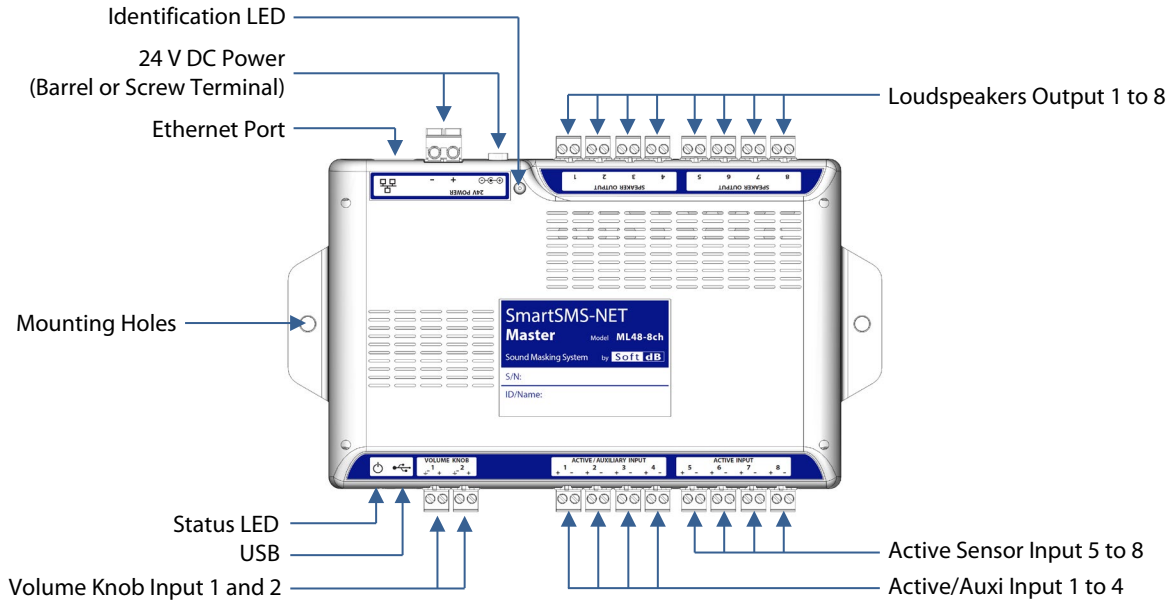
S12-4ch



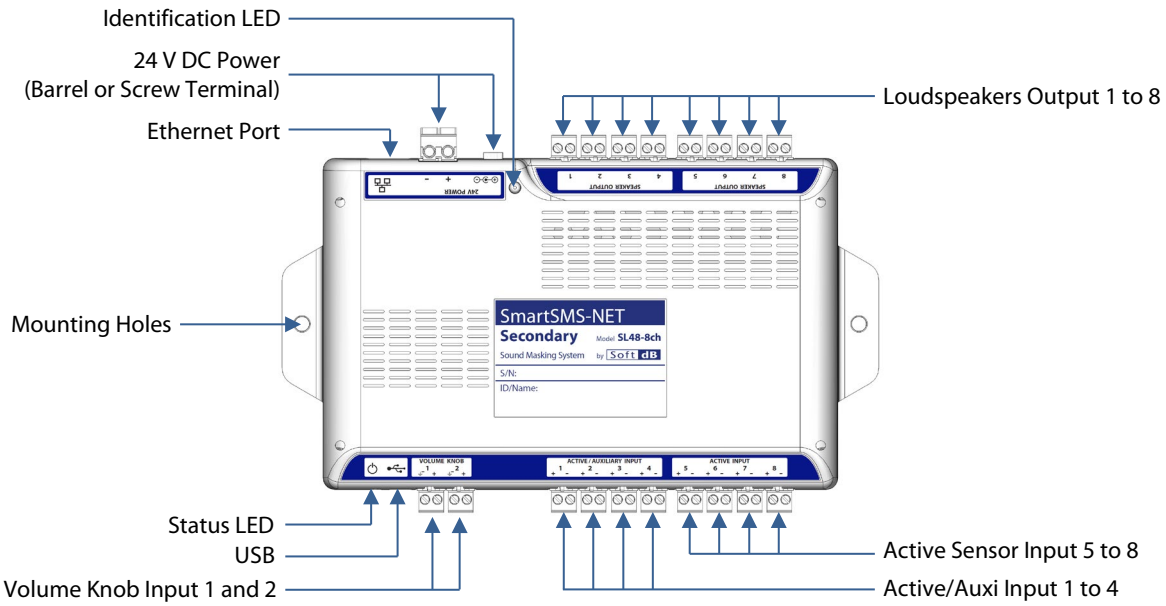
R120-4ch



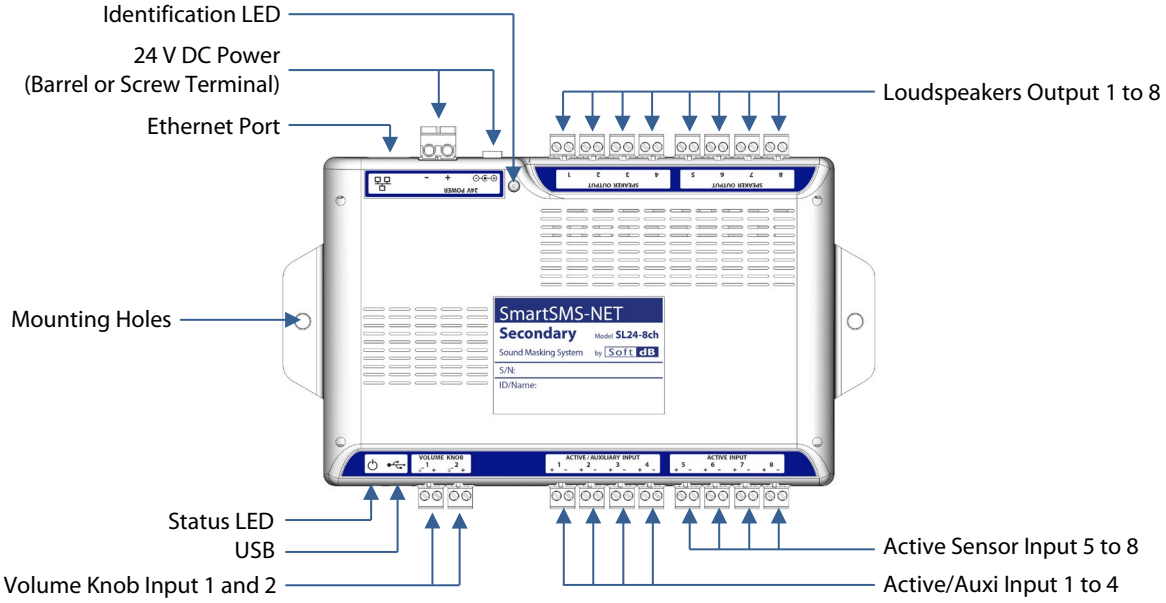
ML48-8ch



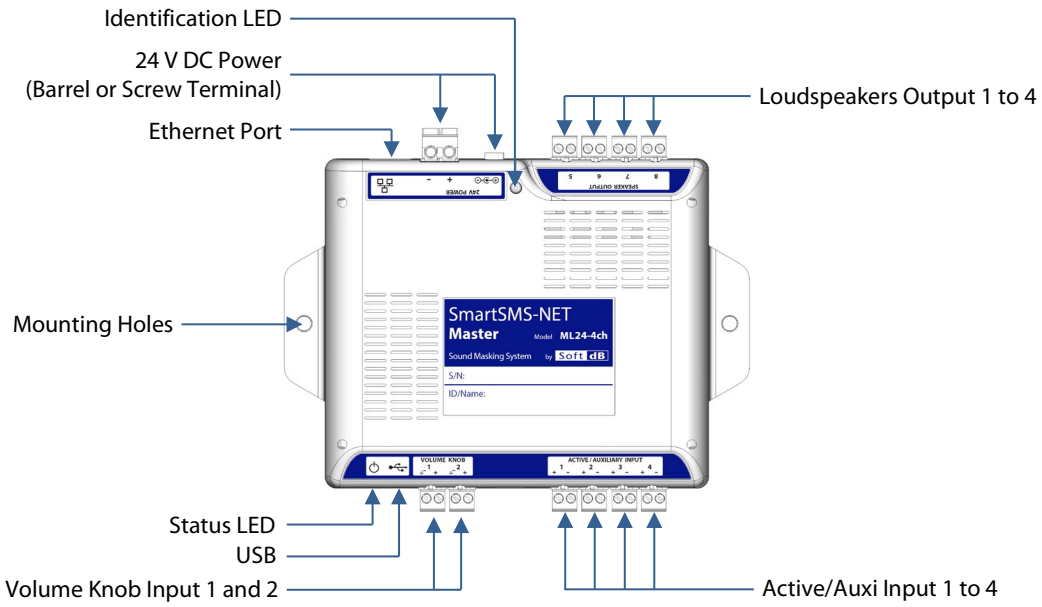
SL48-8ch



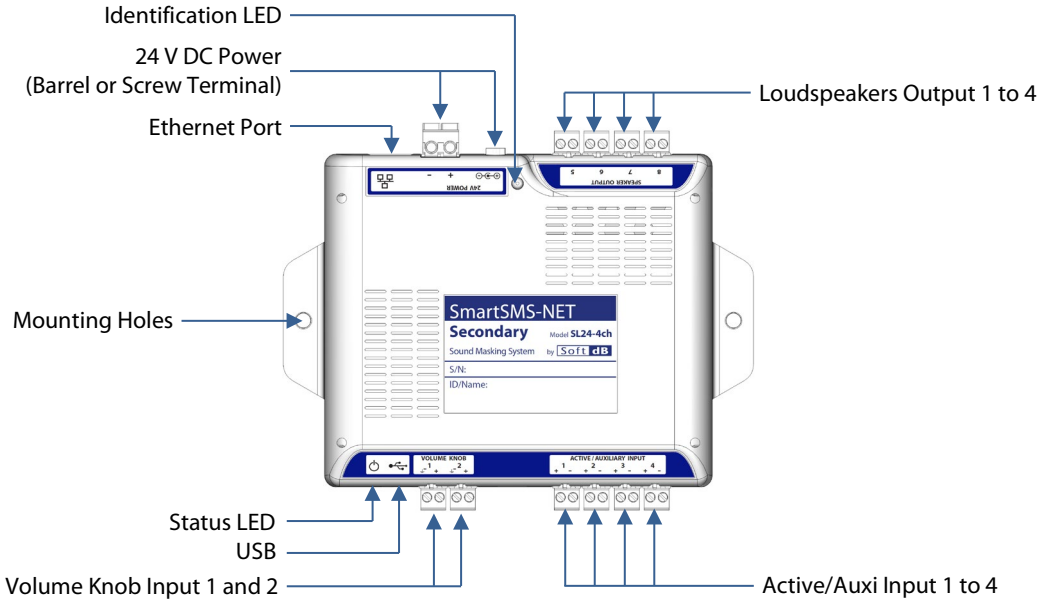
SL24-8ch



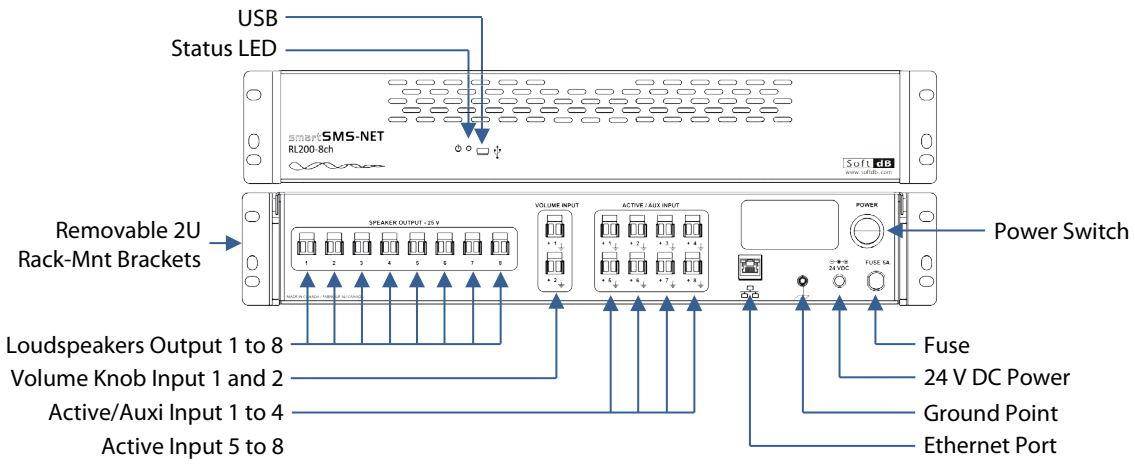
ML24-4ch



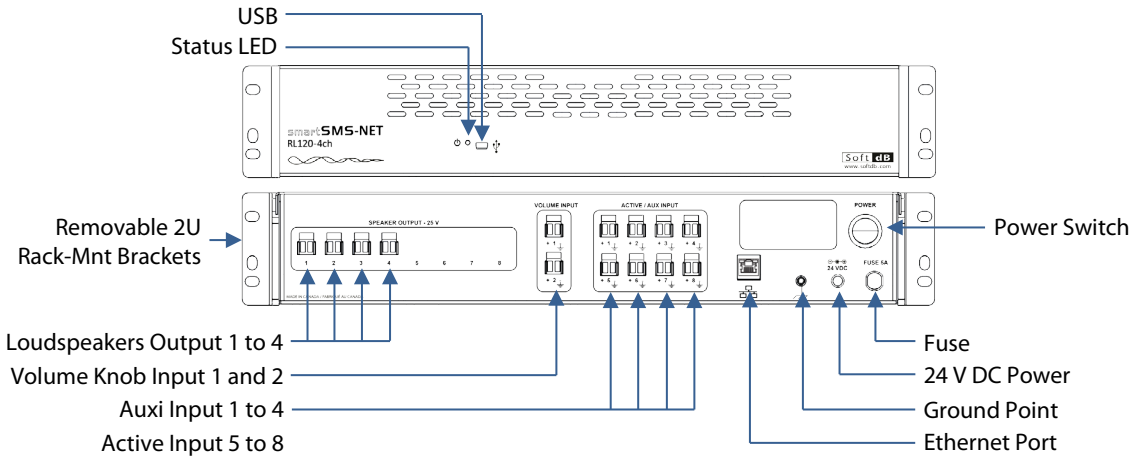
SL24-4ch



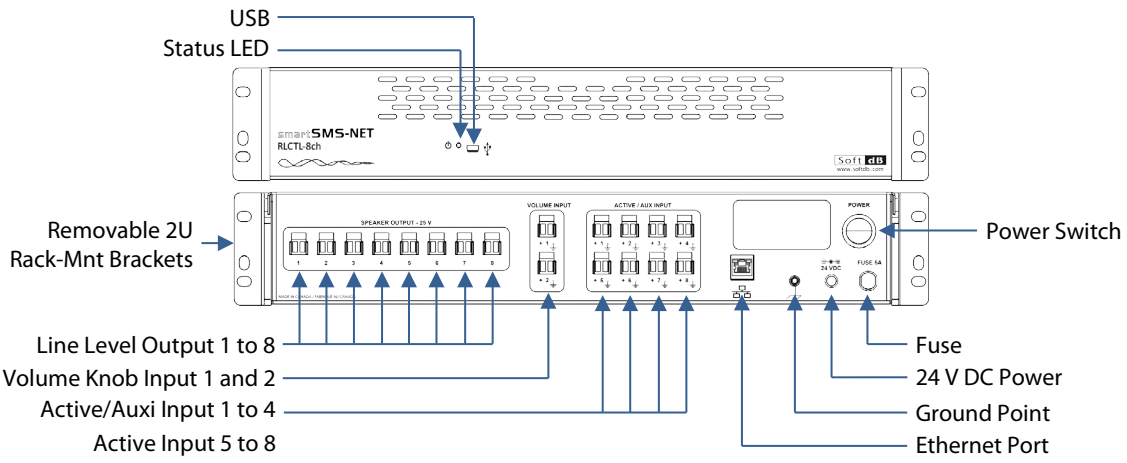
RL200-8ch



RL120-4ch



RLCTL-8ch



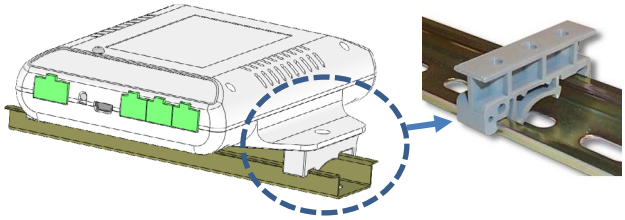
IMPORTANT: The RLCTL-8ch does not include power amplifiers. External amplifiers must be used to drive loudspeakers. The ISA280 from QSC or similar is recommended.

6.2.2 Attaching the Controller Units

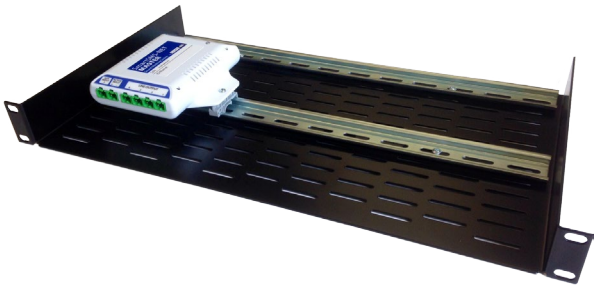
Mini-Plenum Form Factor

The smartSMS-NET controller units with a Mini-Plenum form factor are designed to be installed in the Plenum close to the loudspeaker. These plenum-rated controllers are equipped with two mounting holes allowing to fasten them directly to the building structure.

You can also attach these units to a M350 DIN Rail using commonly available mounting brackets.

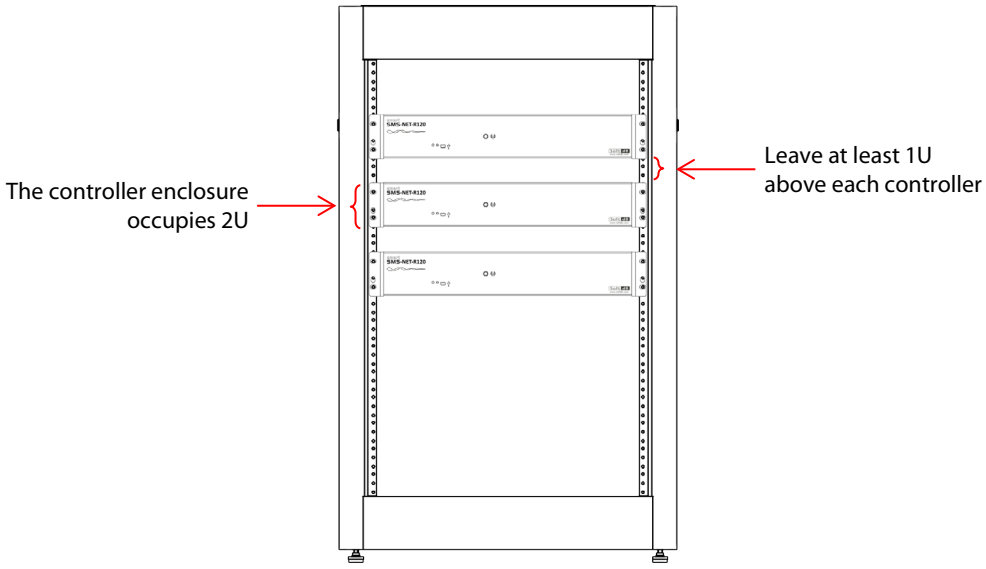


A rack-mount shelf can also be used to install the Mini-Plenum form factor controllers in a rack-mount cabinet. Simply attach DIN-Rails at the bottom of the shelf. Note that a minimum space of 2U is required using this configuration.



Rack-Mount Form Factor

The smartSMS-NET controllers with a Rack-Mount form factor are designed to be installed in a standard 19″ rack-mount cabinet using the provided mounting brackets. The enclosures are 3″ high and occupy a 2U space. It's recommended to leave some room above each controller to allow air circulation.



6.2.3 Powering the Controller Units

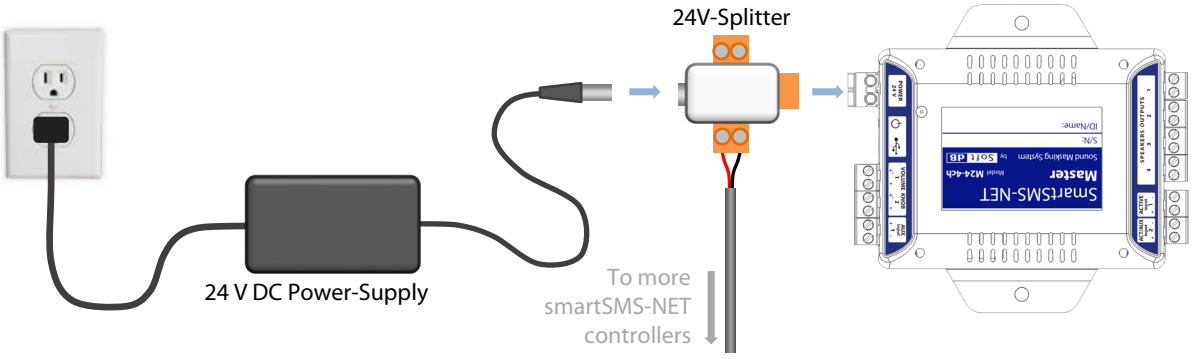
The smartSMS-NET range of controllers all use 24V DC power. The following power-supplies are available:

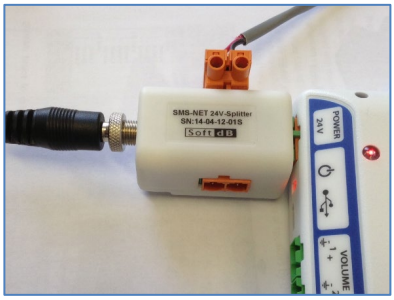
- EA1050 (50W)
- EA1120 (120W)
- EA1160 (160W)

Refer to the specifications for each controller to select the most appropriated power-supply. Note that many smartSMS-NET controllers can be powered from the same power-supply provided that the maximum power does not exceed the power of the power-supply.

Mini-Plenum Form Factor

The Mini-Plenum form factor uses a two-wire terminal block as a power connector. It is recommended to use a "24V-Splitter" to connect the power-supply wire to the smartSMS-NET controller. The "24V-Splitter" also allows to connect additional wires to power more smartSMS-NET controllers from the same power-supply.

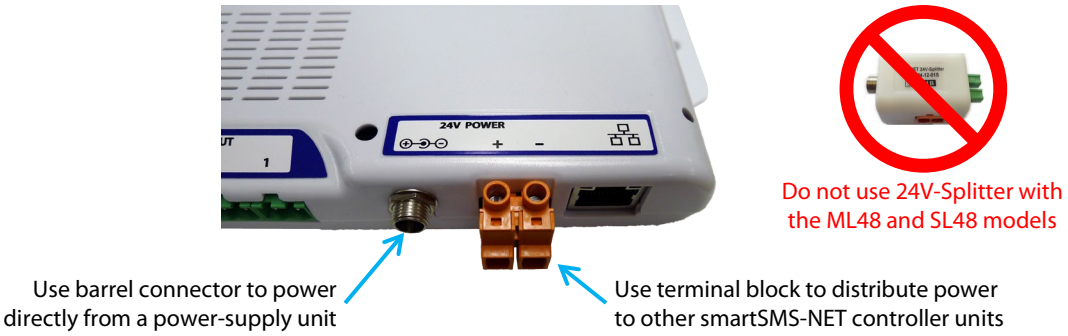




Note: The terminal connectors are also available separately from Weidmüller. (model 1980480000)

Notes on ML48-8ch and SL48-8ch models

The controller models ML48-8ch and ML24-4ch include a barrel connector as well as a terminal block. These controllers can be connected directly to the power supply by using the barrel connector. The terminal block connector can be used to distribute power to other smartSMS-NET controllers.



IMPORTANT: Do not use the "24V-Splitter" with the ML48-8ch and ML24-4ch controller units.

Rack-Mount Form Factor

The rack-mount controllers are high-power controllers. Thus they must be powered using the EA1160 power-supply (160W). Only one controller can be powered per power-supply unit.

6.3 Install Loudspeakers

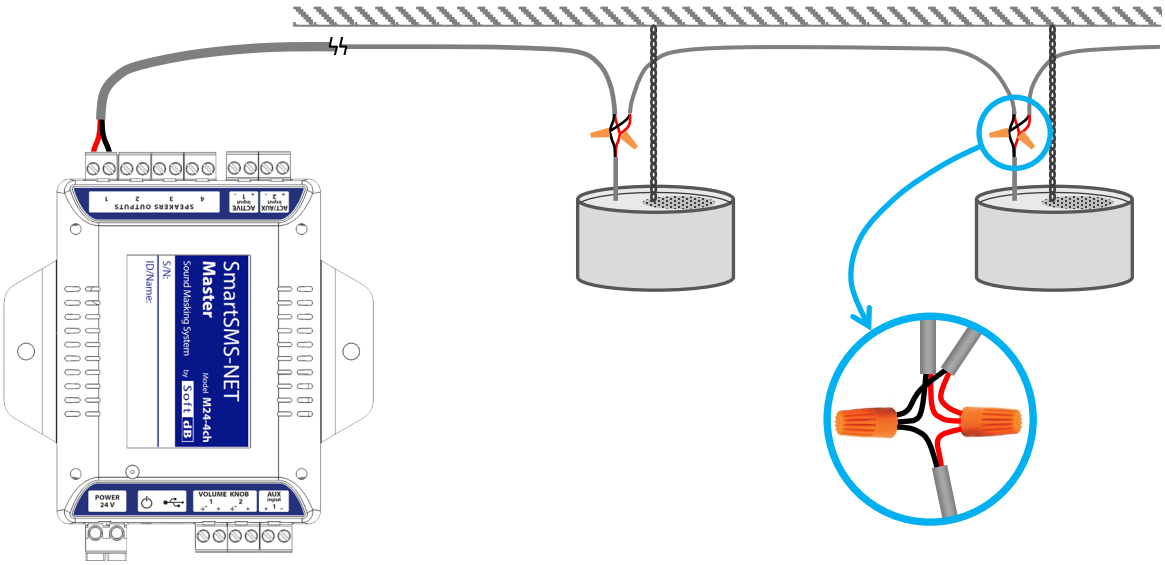
Sound masking loudspeakers are typically suspended from the deck, above the acoustic ceiling tiles. Plenum rated 18 gage 2-conductors wire is used for loudspeaker wiring.

Different types of loudspeaker can be used depending on the installation requirement. The SMS-STR open-structure loudspeaker is the most common for plenum and open structure installation.

SMS-STR
Structure Loudspeaker

Typically the SMS-STR loudspeaker will be suspended with a steel wire or chain attached to the concrete slab or ceiling deck.

Use 18-AWG 2-Conductors wire to connect the loudspeakers to the smartSMS-NET unit. Use plenum rated cable and follow local regulations. Typical wire will be 18/2 FT4. All speakers on a channel are connected in parallel using twist-on connectors.



Depending on the local regulations, the electrical connection on the speaker side can be pushed back inside the speaker and locked with a wire clamp.

Connect the loudspeaker wire to the smartSMS-NET controller unit by using the provided plug (model EDZ950/2 from On Shore Technology inc.)

The SMS-STR tap on the rotary switch (4W to 1/2W@ 25V) can be selected to adjust the output level of each loudspeaker if required. It is recommended to use the **2W @ 25V** tap as a default setting with the smartSMS-NET controllers.

Others types of loudspeakers that can be used are the SMS-PLN plenum loudspeaker, the SMS-FLAT flat loudspeaker when plenum space is limited, and SMS-SURF surface loudspeaker for gypsum board ceiling construction. It is also recommended to use the **2W @ 25V** tap as a default setting on these speakers.

Contact us for more information about these speakers and their installation.

SMS-PLN
Plenum Loudspeaker

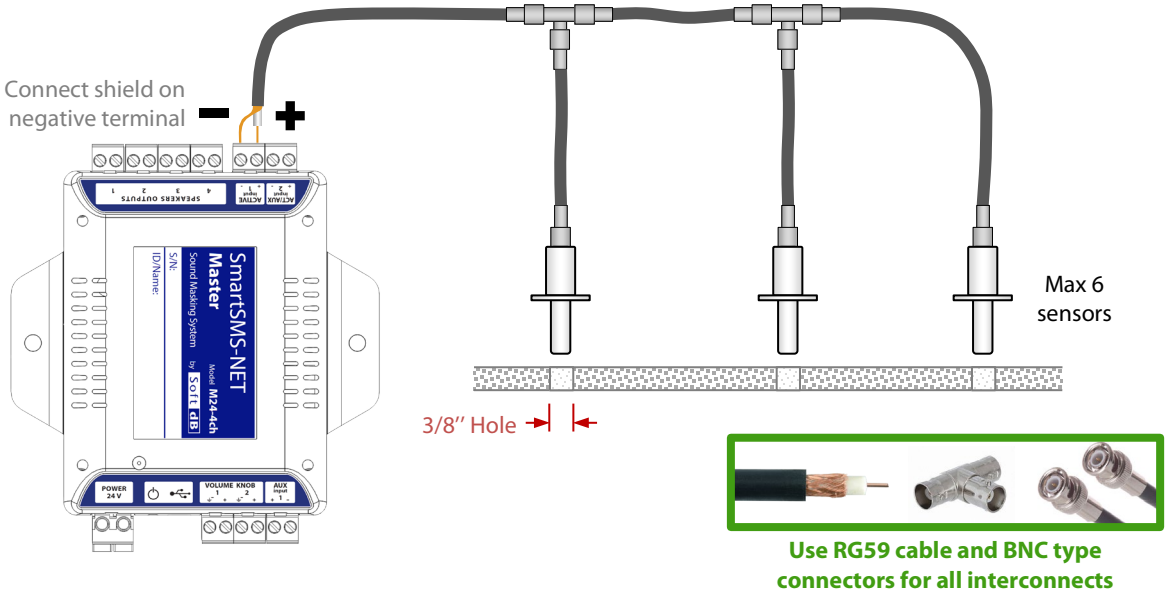
SMS-FLAT
Flat Loudspeaker

SMS-SURF
Surface Loudspeaker

6.4 Install Active Volume Control Sensors

The best location to put the active sound masking volume control sensor is through the acoustic tile. Sensors must be installed, if possible, in a central position to catch most of the noise in the zone. The active sound masking volume control sensors should be installed at least 3 feet away from any HVAC outlet. The air coming out of the outlet can cause turbulence on the sensor and distort the measurements. Refer to Appendix C, Sound Masking Active Volume Control, p.103, for more information on active volume control.

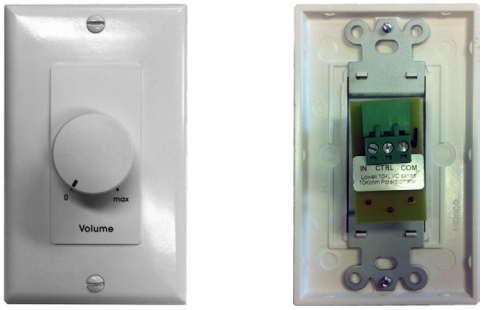
To install the sensor, drill a 3/8 in hole through the suspended ceiling tiles. Connect the sensor with RG59 coaxial cable and BCN connectors. Up to 6 sensors can be connected on the active input On the smartSMS-NET controller, strip the cable, insert the center conductor in the "+" connector, twist the shield and insert in in the "-" connector.



Note: When a long cable is used, it's recommended to run the cable separate from the speaker lines. A minimal distance on 12 inches between the speaker wires and the volume control cable is recommended.

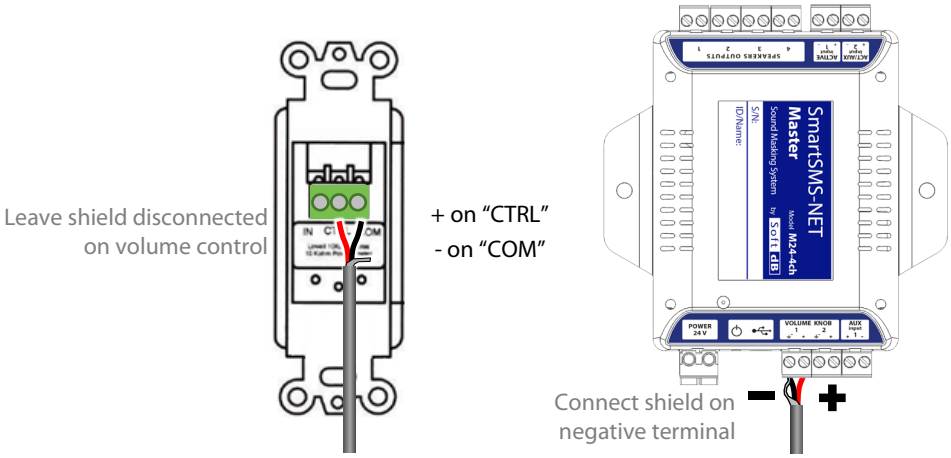
6.5 Install Volume Control Knobs

Up to two volume control knobs can be connected to control the sound masking volume and/or the music and paging volume. The compatible volume control knob is model 10KLVC potentiometer, from Lowell.



Compatible Volume Knob (Model 10KLVC, from Lowell)

Use 22 AWG shielded cable to connect the volume controls. Connect the "CTRL" connector to the red wire and the "COM" connector to the black wire. Connect the red wire to the "+" connector on the controller and the black wire on the "-" connector. Connect the shield on the "-" connector on the smartSMS-NET controller side and leave it disconnected on the volume control side.

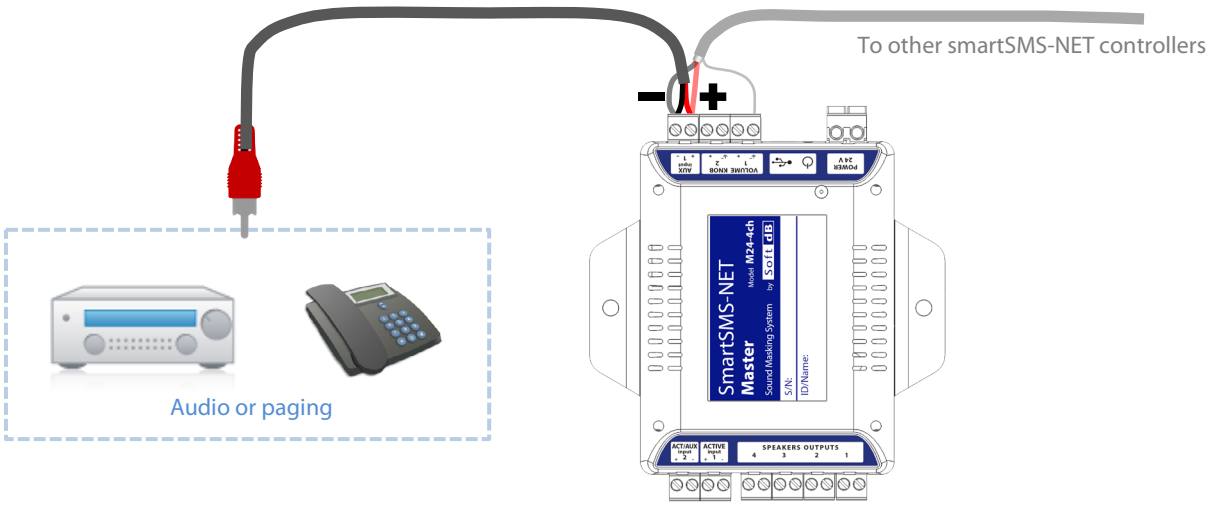


Note: When a long cable is used, it's recommended to run the cable separate from the speaker lines. A minimal distance on 12 inches between the speaker wires and the volume control cable is recommended.

The volume control input can also be used to turn OFF sound masking and music during a fire alarm. Refer to Appendix J Mute Sound Masking and Music during a Fire Alarm, p.130.

6.6 Install Music and Paging

The auxiliary inputs can be used to connect any line-level music or paging source to the system. The auxiliary input range is ±2 V. Only mono channel sources can be connected (no stereo).



It is recommended to use the auxiliary input 1 for paging as this input features a trigger allowing to lower the volume of masking during the public announcement. Refer to section Paging Trigger, p. 68 for more information.

Use shielded cable when distributing the auxiliary signal to additional smartSMS-NET controllers. It's recommended to connect the shield to the ground terminal to lower any noise.

When powering multiple units from the same source, ensure that the source is strong enough. Otherwise, use a preamp to increase the signal strength. As an example, an iPod can drive up to 3 smartSMS-NET controllers directly but requires a preamp when driving more than 3 units.

When telephone paging is required, it is recommended to use a telephone interface such as the BOGEN UTI312. Refer to Appendix I Using the Bogen UTI312 as a Paging Source, p. 129 for more information.

7 Set Up Networking

Once the system components are installed on site, a communication network needs to be implemented for the Project Manager software to communicate with the smartSMS-NET controller units. This communication network can be temporary for simple system commissioning or permanent for system requiring an end-user control panel.

The smartSMS-NET controllers can be connected to the Project Manager software using one of the available communication interfaces:

- **USB**
- Local Area Network (LAN) using **Wi-Fi** (wireless) or **Ethernet*** (wired)

*: Ethernet port only available on selected controllers. See controller model specifications for more information.

All these communication interfaces can be used transparently on the same project meaning that smartSMS-NET controllers can be connected using USB, Wi-Fi or Ethernet without limitation.

Note that communication is required to change system parameters but is not required for normal operation unless an end-user control panel or system monitoring is required.

7.1 Communicate using USB

The smartSMS-NET controllers can be connected using the USB port. Many smartSMS-NET units can be connected at the same time using available ports on the computer or through a USB hub.

Although this structure is very easy to implement, USB communication is not recommended for permanent communication for which Wi-Fi or wired networks are recommended.

7.2 Communicate using Local Area Network (LAN)

The smartSMS-NET controllers are all equipped with a networking interface allowing them to access a Local Area Network (LAN). They all offer a Wi-Fi interface (wireless) and some of them also offer a wired interface (Ethernet).

It is required to use a router to establish the network through which the smartSMS-NET controller units and the computer (with the Project Manager software) will communicate. The link between the router and each device can be either wireless or wired depending on the available interface on the router, computer and controllers.

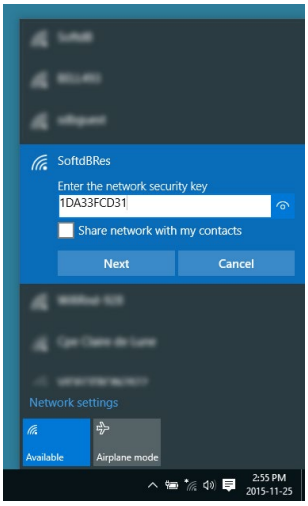
7.2.1 Create a Basic Network

The basic wireless network setup is mainly used to set-up the system parameters during commissioning (calibrate masking equalizers, etc.)

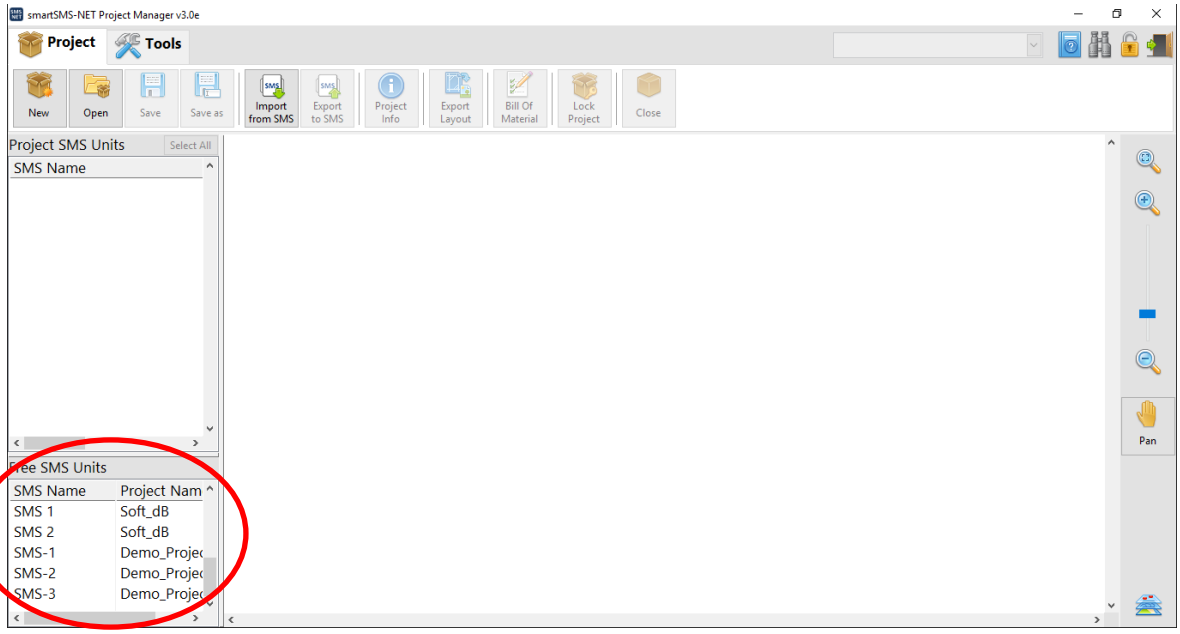
- Step 1: Connect the **pre-configured wireless router** to a power outlet to establish the wireless network. Make sure the wireless network can be reached by the smartSMS-NET controller units as well as the computer. The coverage distance of the Wi-Fi network is about 50 m (165') but it can be affected by barriers such as walls and floor/ceiling assemblies.

Note: For a more complex network configuration, refer to Appendix D smartSMS-NET System Networking, p. 104.

- Step 2: Connect the computer to the **SoftdBRes** wireless network using password **1DA33FCD31**:



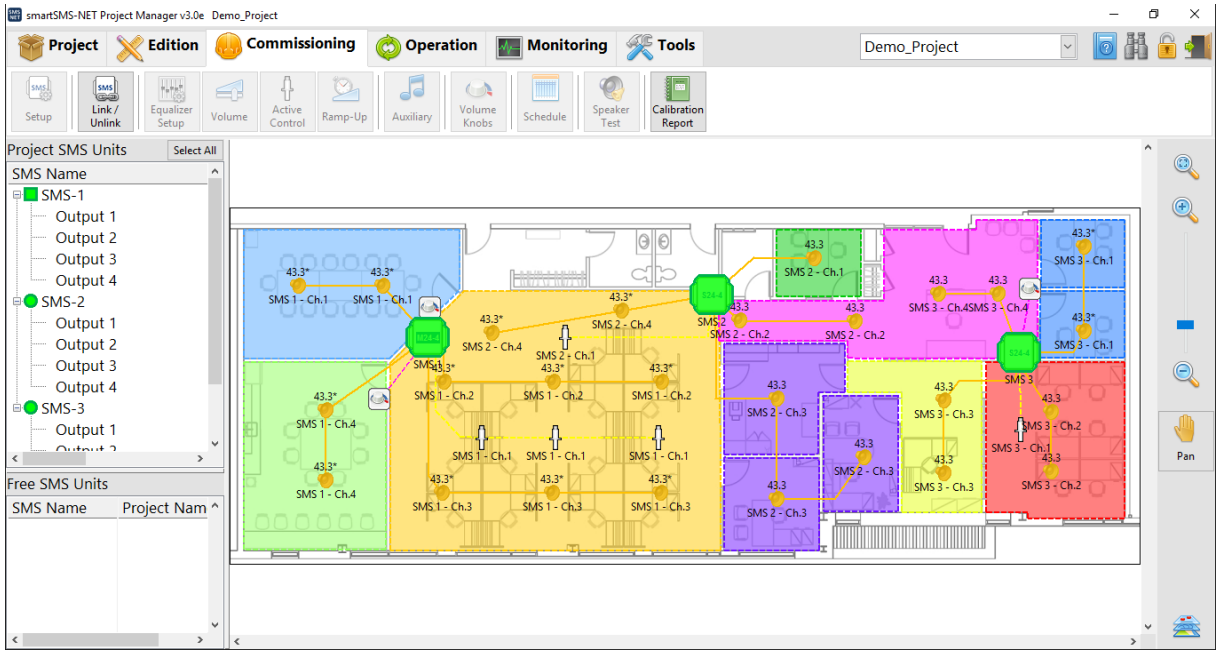
- Step 3: Open the Project Manager software and wait for smartSMS-NET units to be detected. It can take a few seconds until the smartSMS-NET units show up in the software.



8 Set-up System Parameters

Once the system components are installed on-site and wired, the system parameters needs to be set-up.

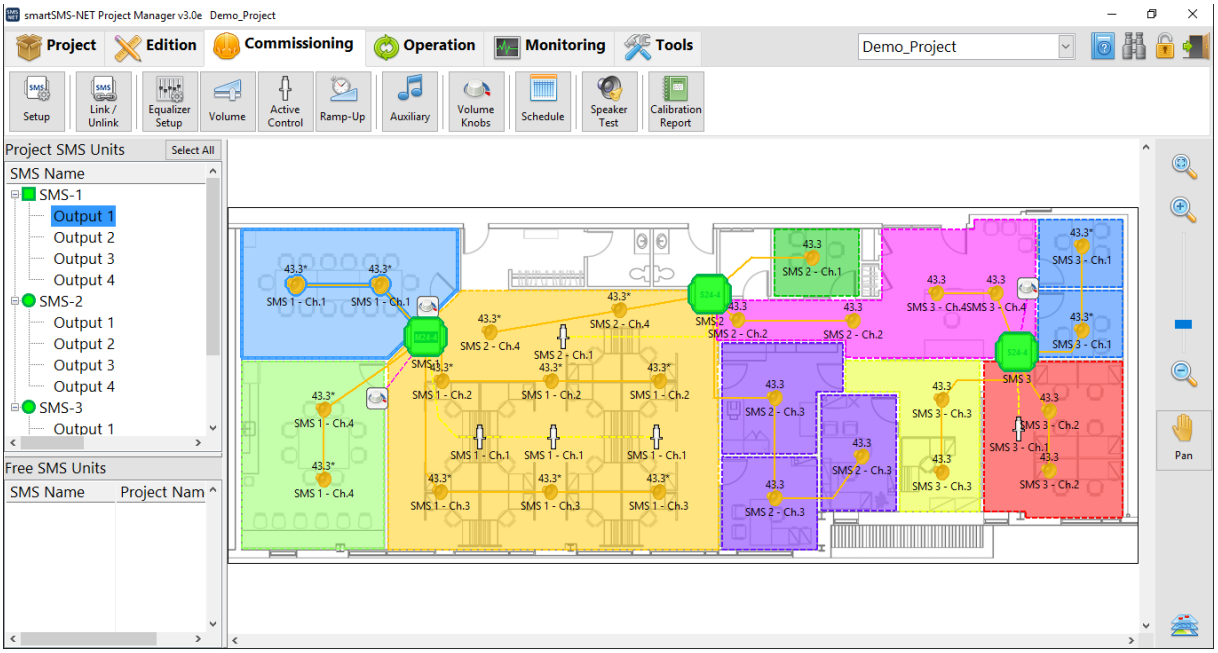
Using the Project Manager software, go to the commissioning toolbar to enter the commissioning mode.



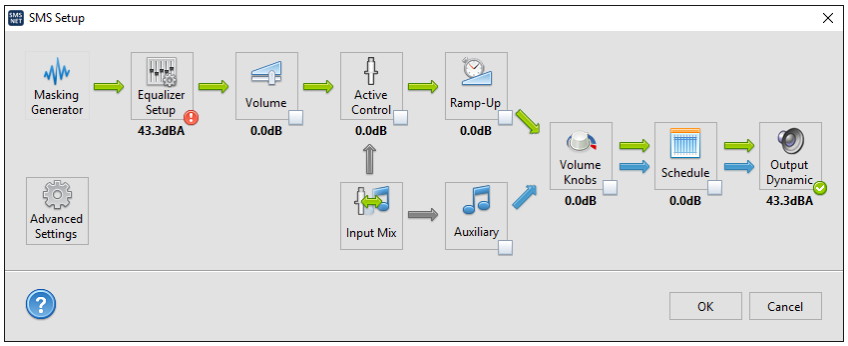
IMPORTANT: Most of the system parameters can be set before the system is installed and even before the smartSMS-NET controller units are linked to the project. The setup parameters are contained in the project file and can be set on the virtual smartSMS-NET controller unit before it is linked. When the unit is linked to a real device, the parameters set for the virtual device are uploaded and synchronised on the physical device.

8.1 Enter System Setup

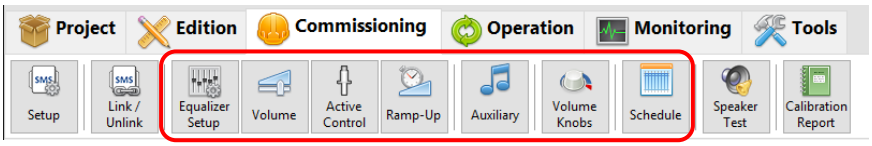
Select the zone or the output channel to set-up. Multiple zones and multiple output channels can be selected at the same time to set-up the parameters of the selected items simultaneously.



Click on the  button to enter the setup interface.



The setup interface makes available all parameters at once. Note that some of these parameters are also accessible directly from the commissioning tab as quick-access functions:



8.2 Adjust the Sound Masking Equalizer

The sound masking equalizer defines the spectrum shape of the masking sound. This equalizer must be adapted to the acoustical environment to produce an appropriate masking sound. There are three ways to adjust the sound masking equalizer:

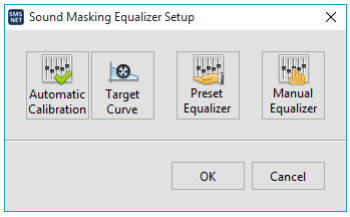
The first one is to calibrate the equalizer using a test microphone. This method is recommended as it provides very precise results. Refer to section 8.2.1 Calibrate the Sound Masking Equalizer, p. 48 for more information.

The second one is to select an equalizer from a set of predefined equalizers. This method can be used when it's not possible to calibrate the system. This method is less precise than equalizer calibration and must be used with great care. Refer to section 8.2.2 Select a Predefined Equalizer, p. 53 for more information.

There can be situations where it's needed to adjust manually the equalizer, either from a calibrated equalizer or a predefined equalizer. When that occurs, you can use the manual equalizer. Refer to section 8.2.3 Manually Adjust the Sound Masking Equalizer, p. 54 for more information.

Click on the 

button from the Setup Interface to enter the sound masking equalizer setup and access these functions:



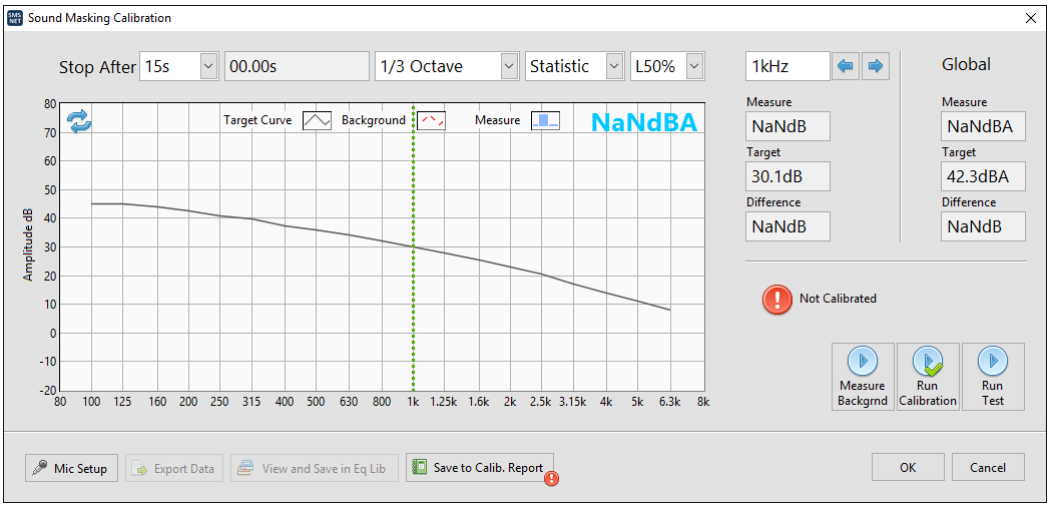
8.2.1 Calibrate the Sound Masking Equalizer

The sound masking equalizer can be calibrated to fit a target sound spectrum. It is highly recommended to calibrate the sound masking equalizer to increase comfort and effectiveness of the sound masking system. For more information on the target sound spectrum, refer to section 8.3 Select the Sound Masking Target Spectrum, p. 55.

To calibrate the sound masking you need to have a calibration microphone. For more information on the calibration microphone, refer to Appendix F, Set-Up the Calibration Microphone, p. 124.

1) Click on the 

button from the Sound Masking Equalizer Setup to enter the sound masking equalizer calibration interface.

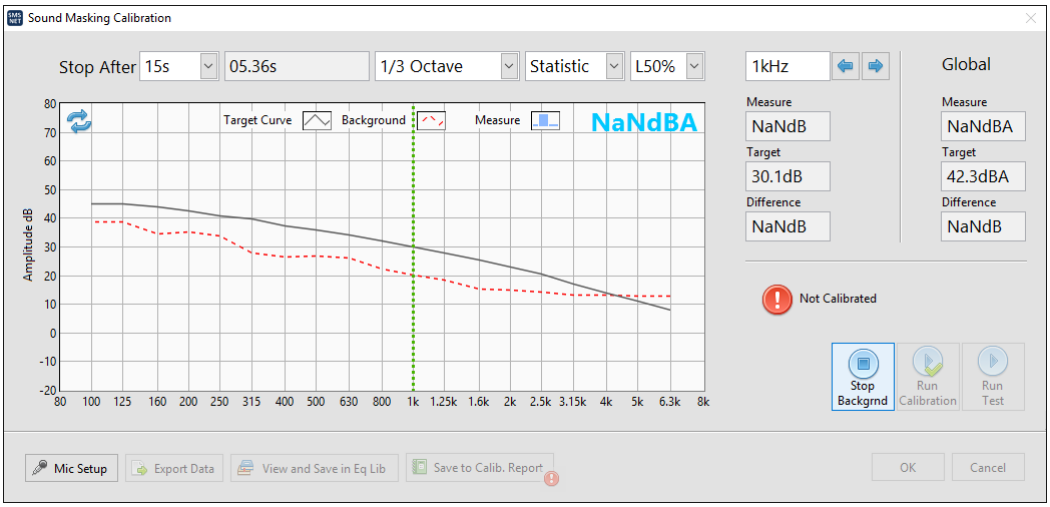


2) Click on the 

button to measure the background noise of the room.

The system will be muted to record the background noise (the noise level without the sound masking). This will determine the lowest sound level which can be reached. If the background noise is higher than the target curve, it will be very hard to calibrate the sound masking equalizer appropriately.

While the measurement is running, walk slowly in the room to cover most of the zone and avoid speaking or making noise; this measurement requires a quiet environment.

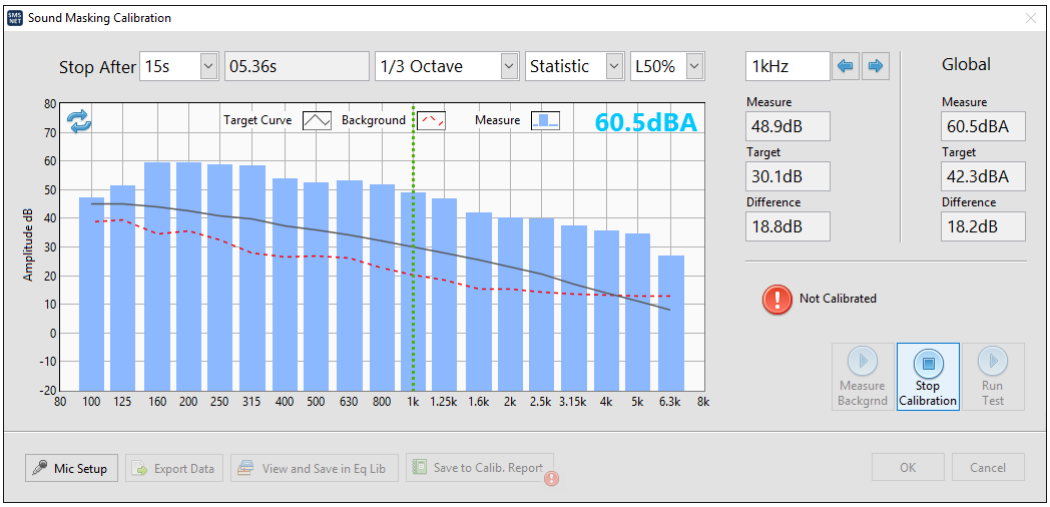


3) Click on the 

button to start the calibration process.

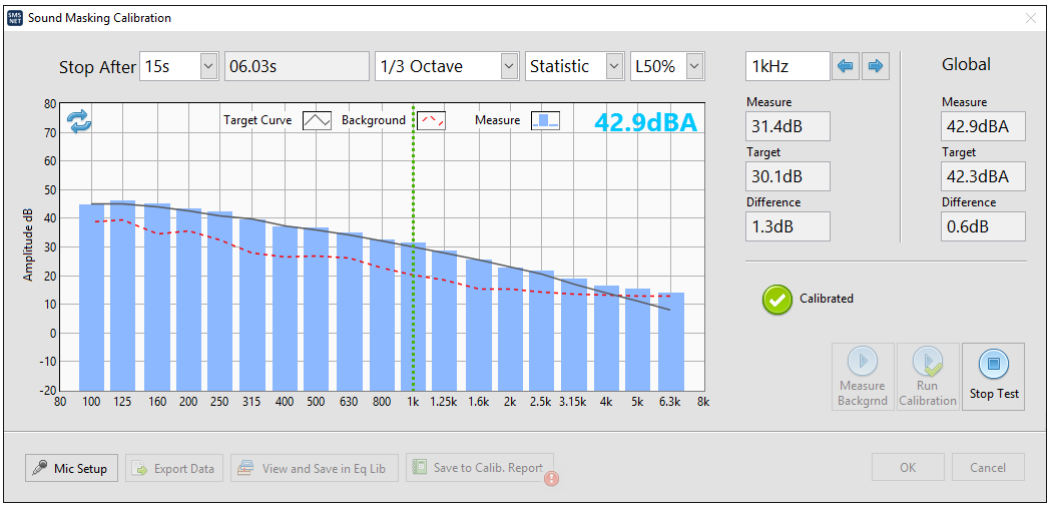
a) The calibration process generates a high volume noise on the speakers, and a reference measurement is started to record the reference sound levels.

b) While the measurement is running, walk slowly in the room to cover most of the zone.



c) The equalizer calibration is computed and applied on the equalizer, and a test measurement is started to check the calibrated sound level.

d) While the measurement is running, walk slowly in the room to cover most of the zone and avoid speaking or making noise; this measurement requires a quiet environment.

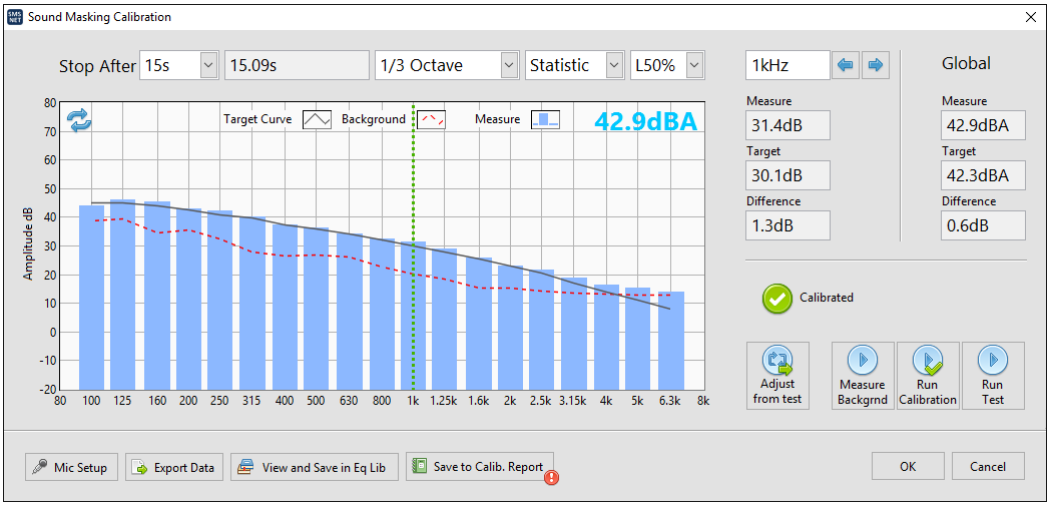


4) You can click on the 

button to adjust the equalizer calibration more finely.

At this point, the equalizer should be calibrated and the calibration status icon should turn to green 

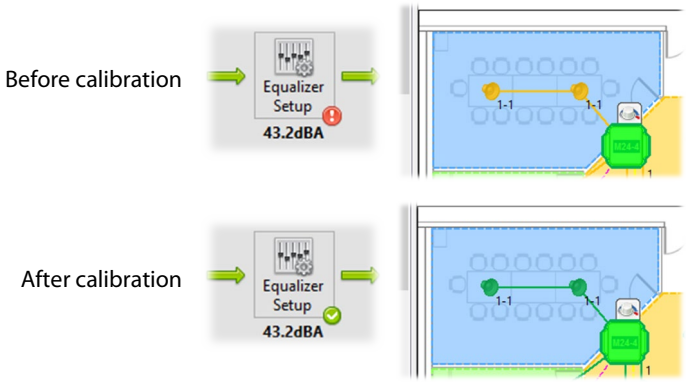
. The resulting masking sound spectrum should be very close to the target curve.



There can be situations where it is hard to reach the target curve. This may be caused by the background noise being too high.

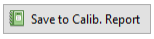
If some frequency bands are not to your liking, refer to section 8.2.3 Manually Adjust the Sound Masking Equalizer, p. 54.

After this process, the bullet next to the Equalizer Setup button will turn to a green thick mark meaning the sound masking equalizer was calibrated. Also, the calibrated speaker lines will be drawn in green indicating a calibrated speaker line.

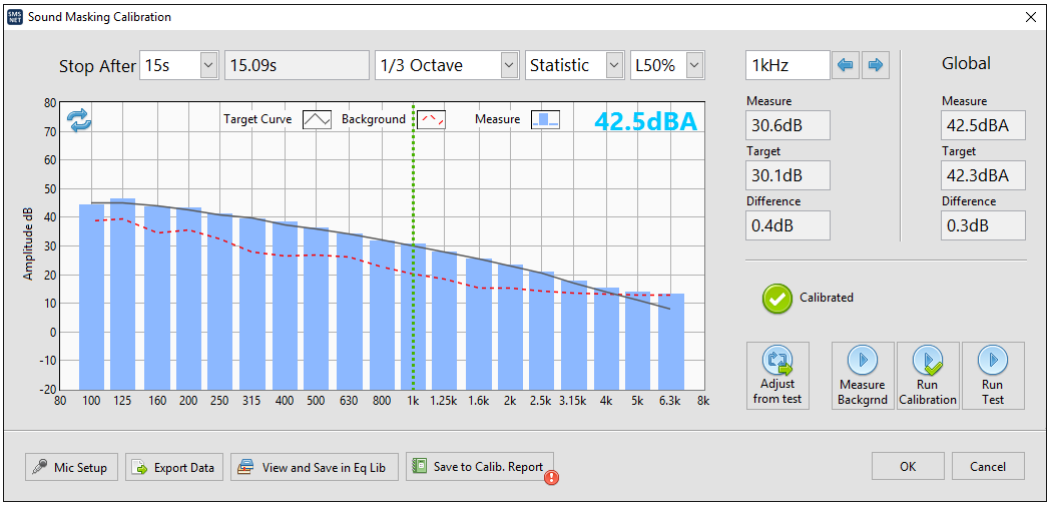


Calibration Report

Save Measurement Data to Calibration Report

Once the calibration is performed, it is recommended to store the measurement results in a calibration report. Upon performing a final test measurement after the calibration, you can save this resulting spectrum by clicking on the 

button:



After this operation, the bullet next to the button should turn green indicating that the data was saved:

Generate Calibration Report

Click on the 

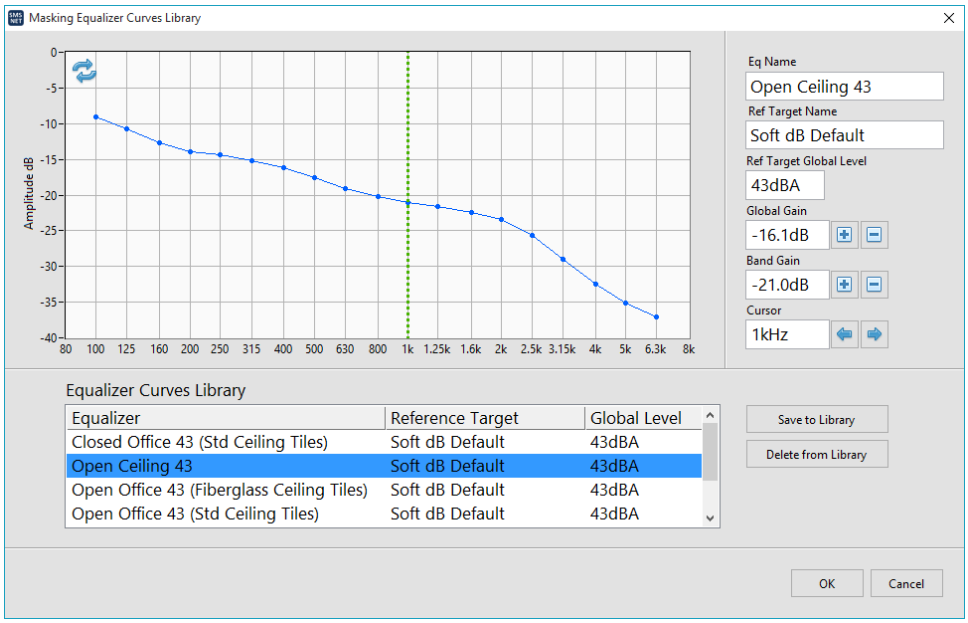
button from the Commissioning toolbar to view the calibration report. The report can be exported as a tab delimited file that you can easily open in Excel.

8.2.2 Select a Predefined Equalizer

In some situations where it is not possible to calibrate the sound masking equalizer, it is recommended to select one of the predefined equalizers from the sound masking equalizer library.

Click on the 

button to launch the equalizer library.



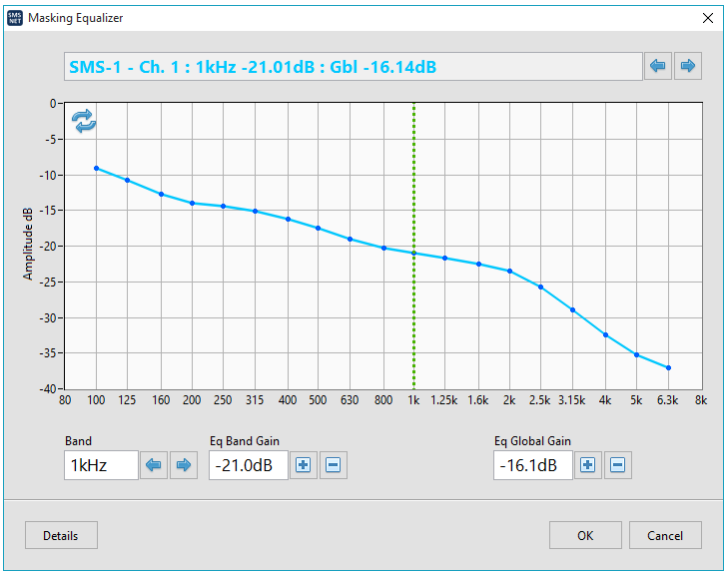
The sound masking equalizer library allows to select a predefined equalizer and also to store custom equalizers to be used later.

8.2.3 Manually Adjust the Sound Masking Equalizer

There may be situations where the calibrated sound masking equalizer needs to be manually adjusted. Perform these steps to do so:

Click on the 

button to open the "Sound Masking Equalizer" interface, and modify each band value individually or increase the overall equalizer gain.

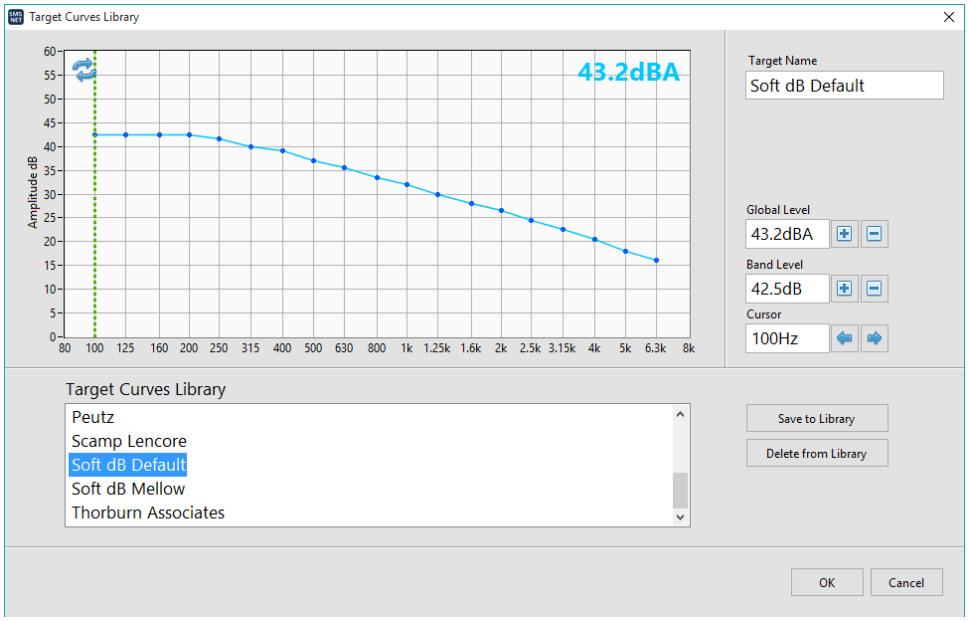


8.3 Select the Sound Masking Target Spectrum

The sound masking target spectrum is a specific spectrum curve used in the calibration process. The equalizer is adjusted so the acoustic output of the sound masking system matches the target curve. Once the sound masking equalizer is calibrated to a specific target curve, the target curve can be changed without losing the calibration state.

Click on the 

button to open the "Target Curves" interface.



The target curve library contains the following curves:

- Armstrong
- Bolt Beranek Newman
- Cambridge Sound
- Haystack
- Lewitz Associates
- NRC Optimum (Bradley)
- NRC Optimum (CopeCal)
- Peutz
- Scamp Lencore
- Shen Milsom Wilke
- Soft dB Mellow
- Soft dB Default
- Thorburn Associates

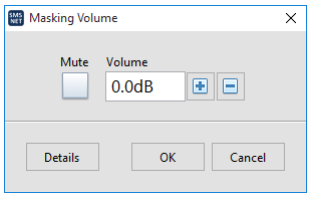
The recommended target curve to use is either **Soft dB Default** or **Soft dB Mellow**. The later has more bass and less treble than Soft dB Default. Custom curves can also be added to the library.

8.4 Adjust the Sound Masking Volume

Once the sound masking spectrum is calibrated according to a specific target curve, there shouldn't be a need to change the volume. However, if it's needed you can change the sound masking in the sound masking volume interface:

Click on the 

button from the Setup Interface to open the "Masking Volume" interface.



8.5 Set-Up the Sound Masking Active Volume Control

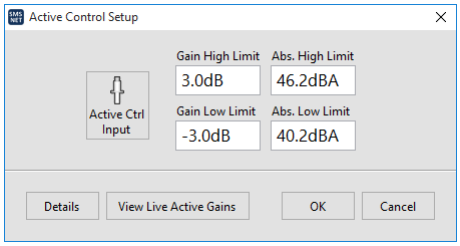
The active volume control allows increasing or lowering the sound masking volume automatically based on the noise activity measured by active control sensors. When noise activity in a zone is higher, the sound masking level will slowly increase and when the sound activity is lower, the sound masking level will slowly decrease. This feature allows to adjust automatically the sound masking at the optimum level.

For more information on active volume control, refer to Appendix C Sound Masking Active Volume Control, p. 103.

For more information on installing the active control sensors, see section 6.4 Install Active Volume Control Sensors, p. 39.

Click on the 

button to open the "Active Control Setup" interface.



To use the active volume control, enable the active control input on the selected output channels from the layout. Then, enter the high and low limits. The high and low limits set the range in which the active control adjusts the volume. The recommended levels are -3dB to +3dB on the calibrated sound masking level.

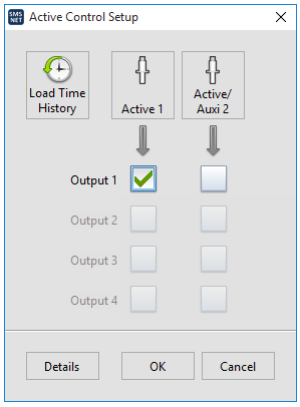
Hence, if the calibrated sound masking level is 43 dBA, the resulting maximum and minimum will be:

- 46 dBA when noise activity is high (noisy)
- 40 dBA when noise activity is low (quiet)

8.5.1 Select the Active Volume Control Sensor Input

To select which active sensor input controls which output channel, click on the 

button to show the active control mixer:



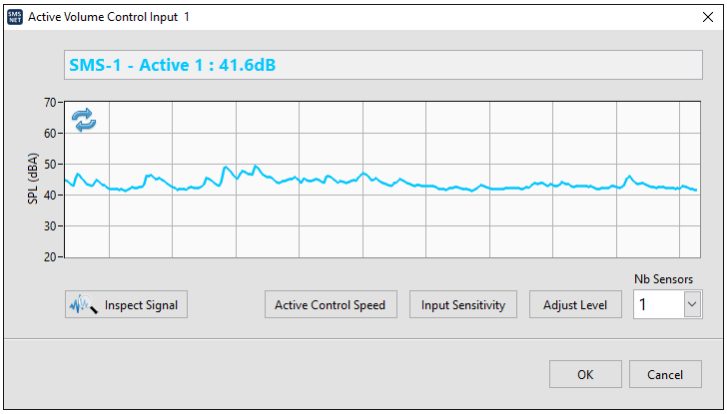
Click on the desired check box to enable an active control input for a specific output channel. Note that only one active input can be used per output but the same active control input can control more than one output channel.

Note: If the buttons and check-boxes for an active control input are disabled and greyed, it means that the input connector is already used as an auxiliary (paging/music) input. Refer to section 8.10, Input Type Selection, p. 75 for more information on selecting the input type for shared inputs.

Adjust the Active Volume Control Sensor Input

Click on the 

button to enter the active volume control sensor input setup:



The Active Volume Control Input setup interface displays a time history of the sound pressure level (SPL) measured by the sensor. The sound levels should be between 40 dBA (background noise without activity) to 70 dBA (ambient noise with strong activity).

Adjust Input Level

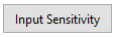
The active control input does not need to be calibrated to work correctly. However, there can be situations where it's needed to adjust the displayed level in order to give better results, especially when active control historic files are to be downloaded.

Enter the number of sensors in the 

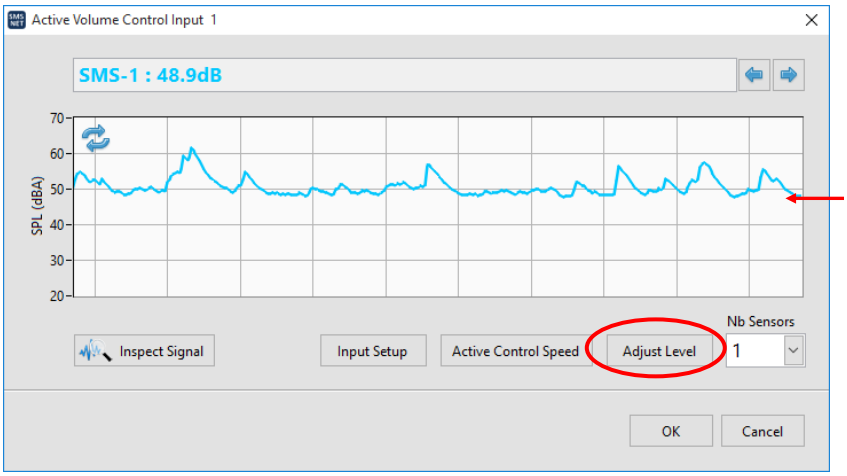
drop-down menu and click on the 

button to adjust the displayed level to the ambient sound level.

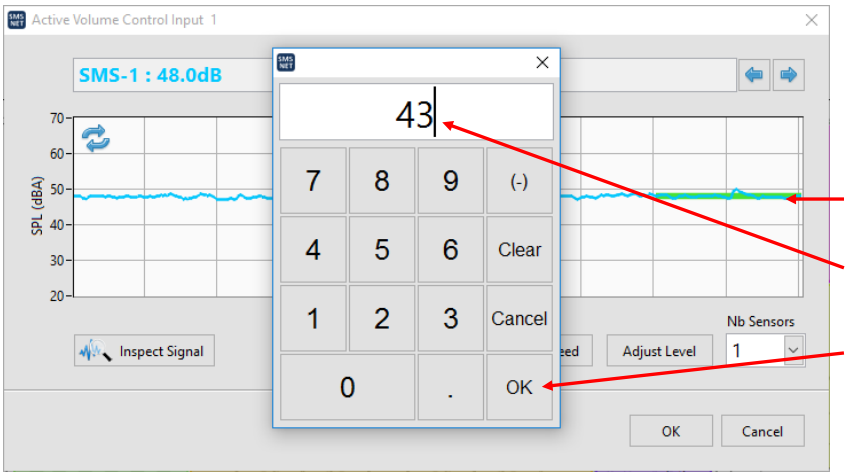
It is recommended to perform this operation with sound masking ON but without any other ambient noise. In this situation, the ambient sound level should be equal to the target curve level. Hence, the level to enter upon level adjustment should be the target curve level.

You may also adjust the sensitivity directly by clicking on the 

.



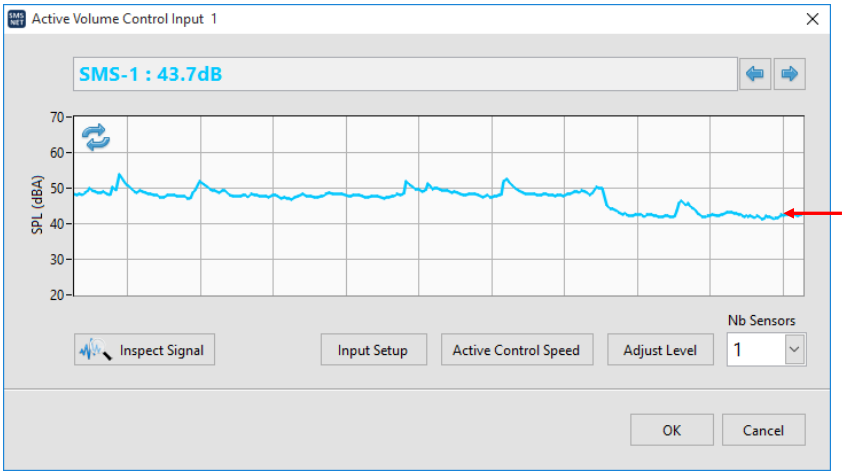
~48 dBA



Wait for stable level

Enter wanted level

Hit “OK”

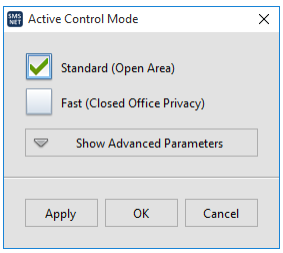


Adjusted Level

Adjust Active Control Speed

Click on the Active Control Speed button to select from the two available modes:

- **Standard (Open Area)**: This mode should be used when using active volume control to adjust the sound masking volume as a function of the ambient noise activity in an open area.
- **Fast (Closed Office Privacy)**: This mode should be used when using active volume control to adjust the sound masking volume of an adjacent zone from the noise activity of a closed office. Its purpose is to increase the sound masking around a closed office when people are speaking inside the closed office to increase privacy.



It is recommended to use one of these two modes for active control speed. However, the advanced parameters can be modified should one want to fine tune the active control:

The "Up Gain Rate Limit" and "Down Gain Rate Limit" are the maximum volume increase and decrease per analysis period (15s).

The "Sensitivity" along with the "Multiplier" values is used to determine the behavior of the active controller. Low sensitivity values (8 and less) require louder activities in the room to increase the sound masking volume while high sensitivity values will increase the sound masking volume even for a room with a low activity. When set higher than 1, the multiplier allows reaching the high or low limit of the active gain in a shorter time.

View Active Control Time History

The smartSMS-NET unit records the sound level time history (activity noise and background noise) on its on-board memory. This data can be downloaded later for further analysis and tuning of the active volume control.

Click on the 

button to load the active control time history in the post-processing utility. For more information on this utility, refer to Appendix L Post-Process Active Control History Files, p. 132.

The active control time history can also be downloaded automatically to monitor the sound environment of the office. For more information on this feature, refer to section 9.2 Set-Up Automatic Active Control History, p. 83.

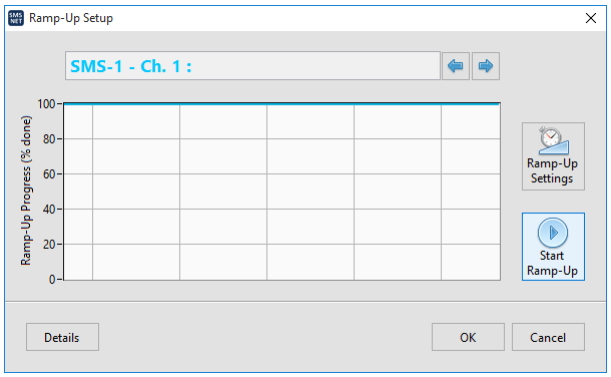
Note: The maximum duration of the time history is 7 days.

8.6 Set-Up the Sound Masking Ramp-Up

The sound masking ramp-up is a feature allowing to increase slowly the sound masking volume following a system installation. The sound masking advent will be unnoticed if the sound masking volume increases slowly over a period of a few days to a few weeks.

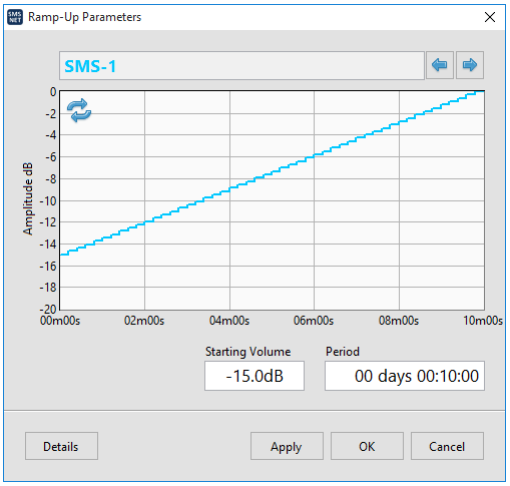
Click on the 

button to open the “Sound Masking Ramp-Up” interface.



To adjust the ramp-up slope, click on the 

button.

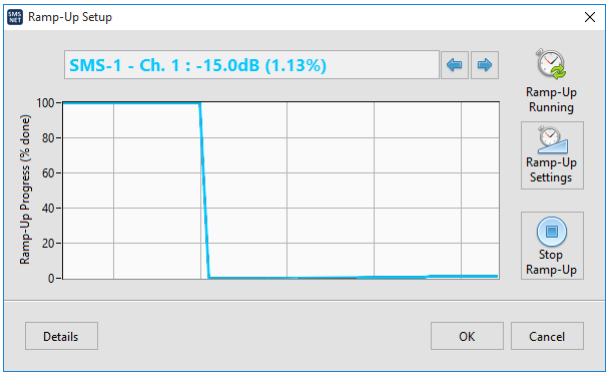


There is one Ramp-Up counter per smartSMS-NET controller unit and each output channel can be activated on this counter.

8.6.1 Start the Sound Masking Volume Ramp-Up

Click on the 

button to start the ramp-up process for the selected output channels.



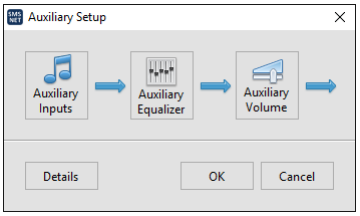
Following the "Start Ramp-Up" command, the sound masking volume goes down and starts to gradually increase over the specified period.

Note: The "Start Ramp-Up" command initiates the ramp-up function on the selected output channels only. Should you want to initiate the ramp-up for the whole project, select all channels on the layout plan or in the project list and click on the "Start Ramp-Up" button.

8.7 Set-Up Music and Paging Inputs (Auxiliary)

Click on the 

button to open the "Auxiliary Setup" interface.

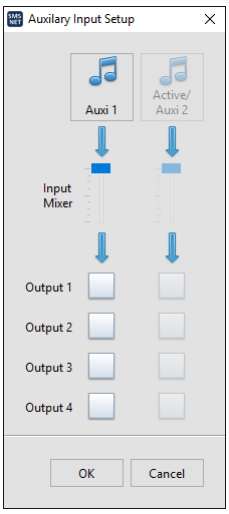


Refer to section 6.6 Install Music and Paging, p. 41 for more information on auxiliary installation and wiring.

8.7.1 Select Auxiliary Inputs

Click on the 

button to select the auxiliary inputs to mix to the selected outputs:



All available auxiliary input can be activated on a given output channel. The most used setup is to use one auxiliary input for paging and another one for music.

It is recommended to use the Auxiliary Input 1 for paging as it can be activated as a triggered channel for important paging announcements. For more information, refer to section Paging Trigger, p. 68 for more information on this feature.

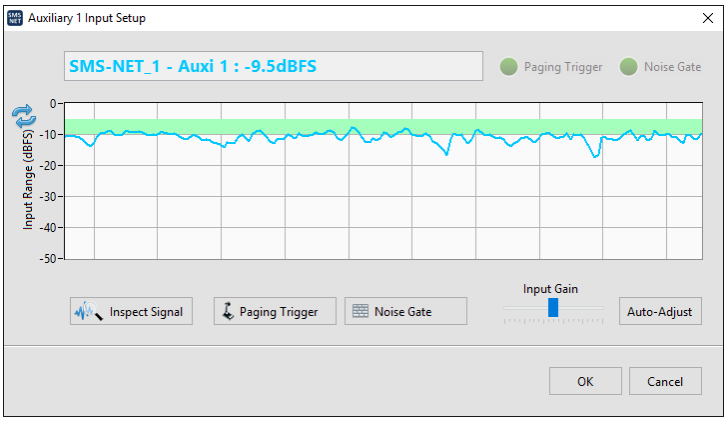
Note: If the buttons and check-boxes for an auxiliary input are disabled and greyed, it means that the input connector is already used as an active volume control sensor input. Refer to section 8.10, Input Type Selection, p. 75 for more information on selecting the input type for shared inputs.

Auxiliary Input Gain

The first thing to do when using the auxiliary inputs is to adjust the input gain. The following steps explain how to adjust the input gain correctly:

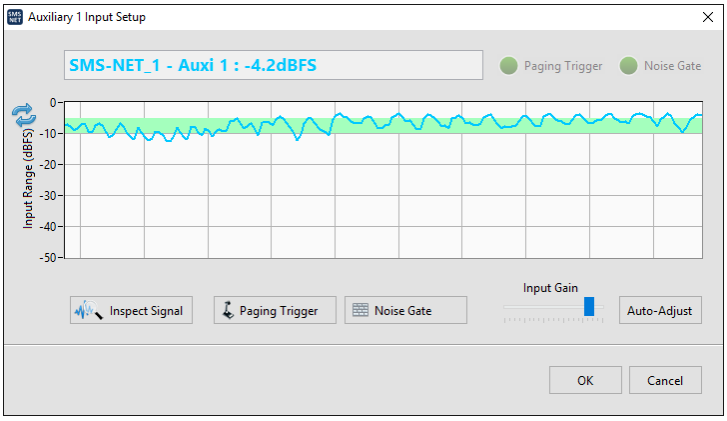
1) Make sure the auxiliary input is appropriately connected to an audio source. Refer to section 6.6 Install Music and Paging, p. 41for more information.
2) Adjust the volume of the audio source at **75%** (if available).
3) Click on the 

button to access the selected auxiliary input.



4) Check the signal historic. The blue line corresponding to the audio signal amplitude should be between -5 and -10 dB (green area).
5) If the signal is not between -5 and -10 dB, click on 

to adjust the gain automatically. You can also adjust the gain manually using the numeric field.

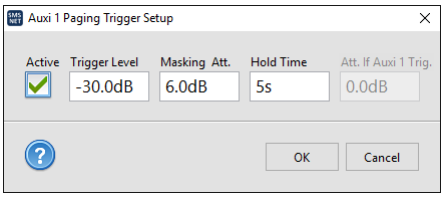


6) Following the gain adjustment, the audio signal should be between -5 and -10 dB (green zone). If the signal is still below this range, the source is too low and you must increase the source volume.

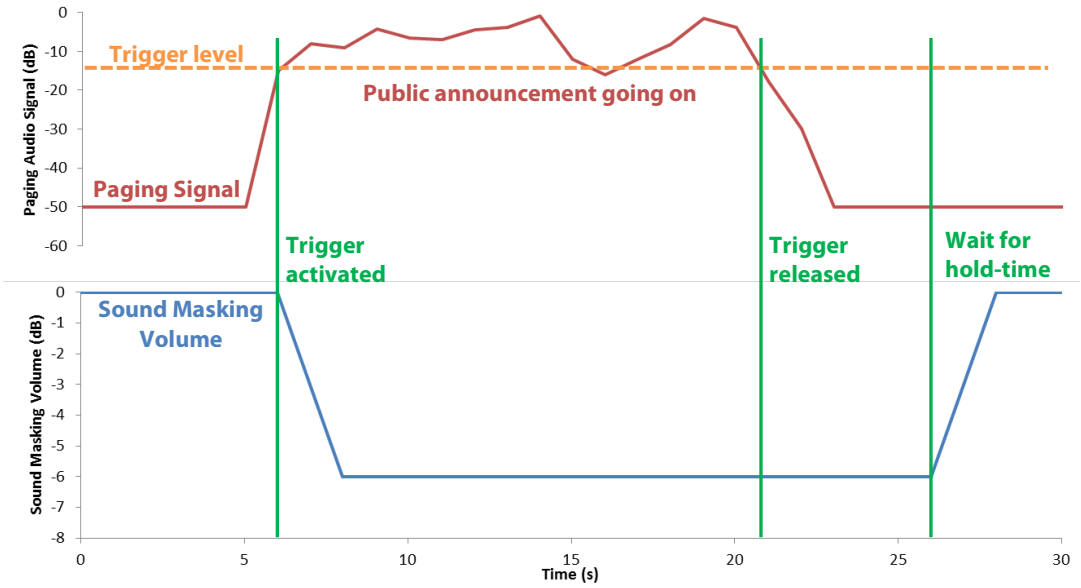
Paging Trigger

The paging trigger should be used when using the auxiliary input as a paging input.

Click on the Paging Trigger button from the auxiliary input setup to enter the paging trigger setup:



The trigger monitors the audio signal on the auxiliary input and when the audio signal reaches a certain level (meaning that a public announcement is going on), it lowers the sound masking and holds it down until the announcement is over. When the announcement is over, the sound masking volume goes back to normal.



Note: If volume control knobs are installed and set to control the auxiliary input, they are momentarily disabled during the paging to make sure the public announcement is heard.

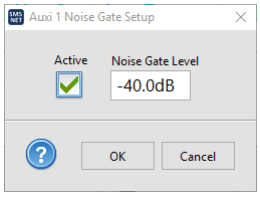
Priority Call Function

The "Priority Call" function allows to lower the other auxiliary inputs volume while there is a paging announcement on auxiliary input 1. Use the "Att. If Auxi 1 Trigg." control to set by how many dB you want the current auxiliary input to be attenuated when the Auxiliary input 1 is triggered. This option is available only for auxiliary inputs other than 1.

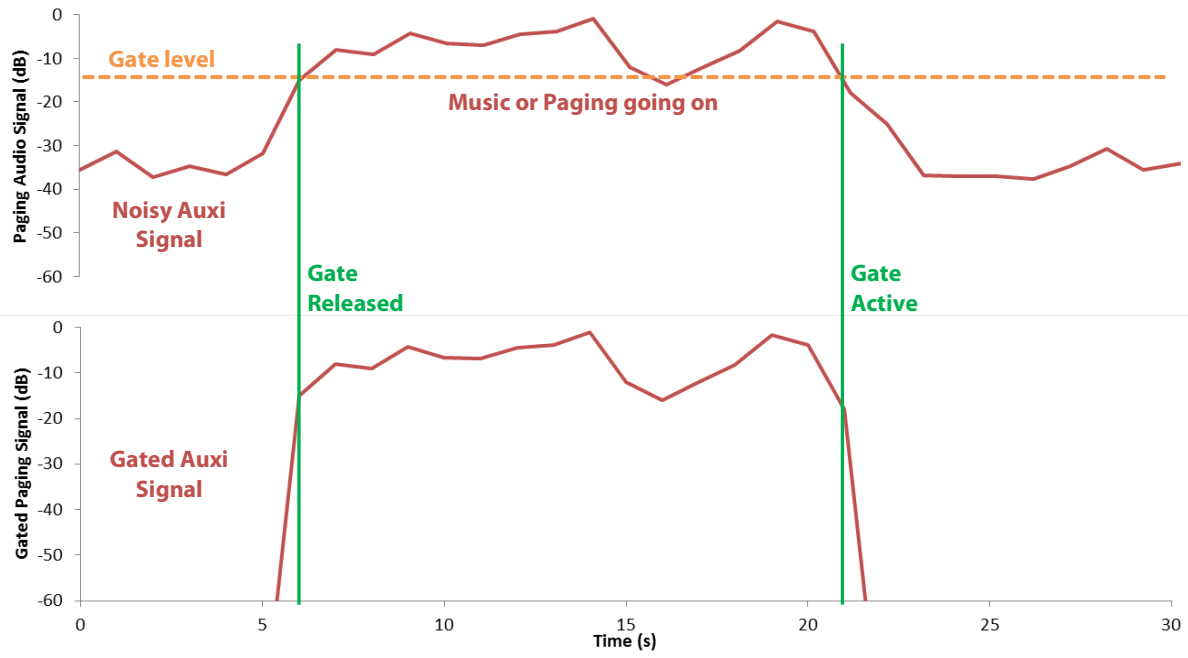
Noise Gate

The noise gate should be used when the auxiliary signal contains a low amplitude noise like a hum or a buzz.

Click on the Noise Gate button from the auxiliary input setup to enter the noise gate setup:

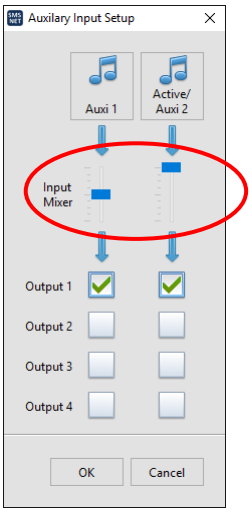


The "Noise Gate" mutes the auxiliary input when the audio signal on this input is lower than the gate level.



8.7.2 Adjust Auxiliary Input Mixer Volume

Once the input gain has been set for both inputs, the respective volume of each auxiliary input can be set using the mixer volume. The mixer volume is used when using both auxiliary inputs for music and paging. One could want to adjust the volume of the music input lower than the volume of the paging. Use the vertical cursors to adjust the volume of each input with respect to the other:

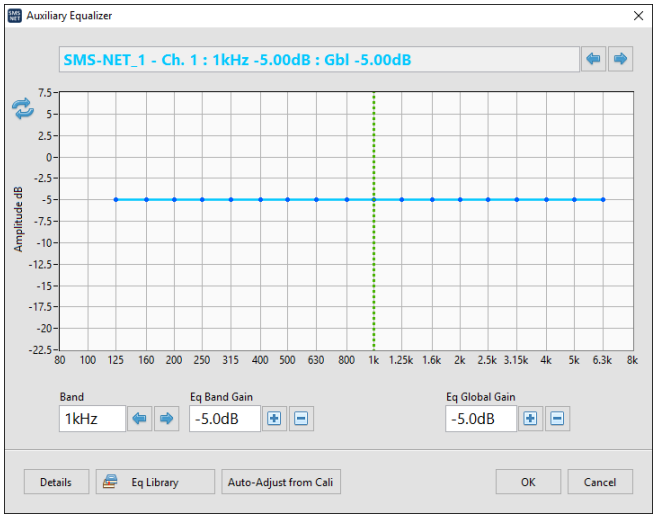


8.7.3 Adjust Auxiliary Equalizer

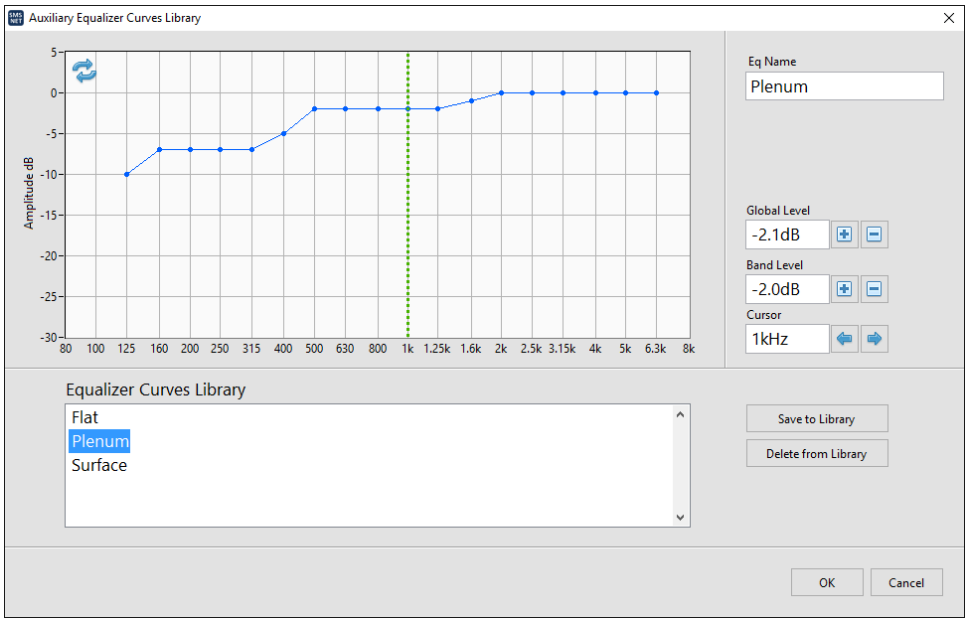
Once the auxiliary inputs are adjusted one to another (gain and mixer volume) it is possible to apply an equalizer to enhance the audio quality.

Click on the 

button to open the auxiliary equalizer interface:



While the default equalizer is flat, you can load pre-set equalizers from the equalizer library by clicking on the Eq Library button.



The equalizer library contains pre-set equalizers to use in different situations:

- Flat equalizer should be used for open ceiling;
- Plenum equalizer should be used for speakers in plenum. (high frequency content is amplified to compensate for the ceiling tile transmission loss;
- Surface equalizer should be used for surface loudspeakers. (the frequency content is adjusted for direct field)

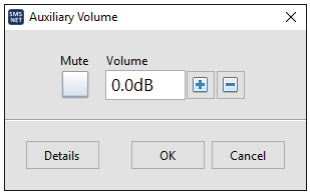
Note: You can also create custom equalizers and save them to the library.

8.7.4 Adjust Output Auxiliary Volume

The auxiliary volume is applies to the music/paging signal for each output channel.

Click on the 

button to control the general auxiliary volume.



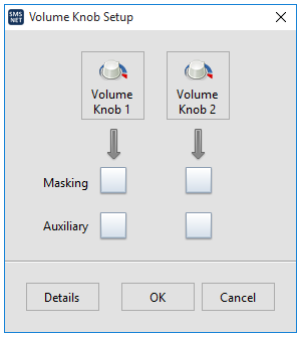
8.8 Set-Up Volume Control Knobs

The smartSMS-NET system provides two volume control knob inputs per controller. This section gives information on the software parameters regarding volume control knobs.

Refer to section 6.5 Install Volume Control Knobs, p. 40 for more information on hardware installation and wiring.

Click on the 

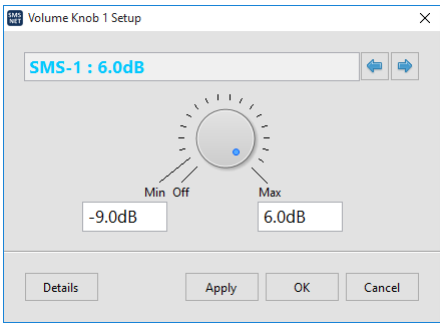
button to open the "Volume Knob Setup" interface.



The volume control knobs can control the volume of sound masking and/or auxiliary (music and paging)

The knob maximum and minimum volumes can be set by clicking on the 

buttons.



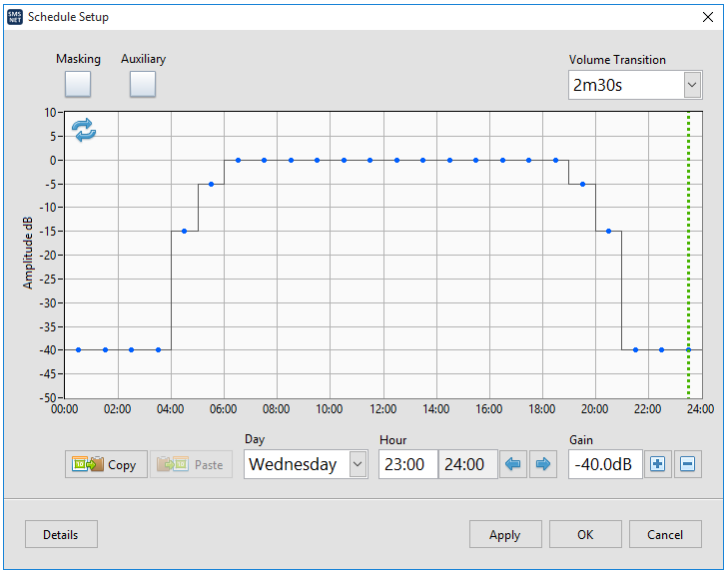
Note: A volume knob can be tested using this interface. Turn the volume knob and the knob image on the software interface should turn at the same position.

8.9 Set-Up the Volume Schedule

The volume schedule allows adjusting the volume of the sound masking and/or the music according to certain periods of the day and certain days of the week.

Click on the 

button to open the "Volume Schedule" interface.



1) Click on the check boxes on the top-left corner to enable the volume schedule for the selected zone(s), SMS unit(s) or speaker(s). The volume schedule can be set for sound masking and/or music.
2) Select the day of the week in the drop-down menu.
3) Click on the graph to select the period to modify, or select the period on the "Period" numeric field.
4) Click on the "Gain" numeric field or click on the graph to change the calendar gain of the selected period.
5) Repeat the process for all days of the week.

Note: You can copy a schedule from any day and paste it to another day using the copy/paste buttons.

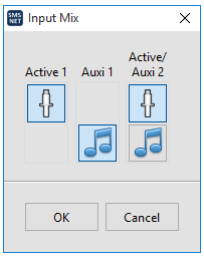
8.10 Input Type Selection

Most smartSMS-NET controller units offer shared input connectors which can act as an active volume control sensor input or an auxiliary (music/paging) input. There are two ways to define the input type for each input connector:

The first way is by drawing a wire to the smartSMS-NET controller on the layout. If a sensor is connected, it will define the input as a sensor input and when an auxiliary source is connected, it will define it as an auxiliary input.

The second way is to manually force it in the input mix interface. Click on the 

button from the Setup interface to access the input mix interface:

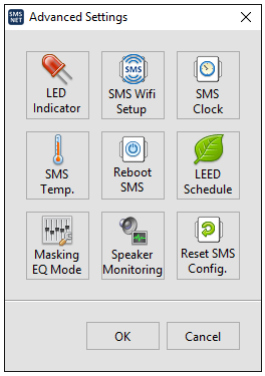


Note: This interface may look different depending on the smartSMS-NET controller model. Some models offer more inputs than other.

8.11 Advanced Settings

Click on the 

button to open the "Advanced Settings" interface



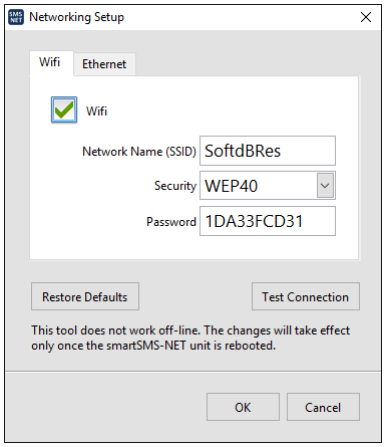
8.11.1 LED Indicator

The lighting mode of the LED indicator on the smartSMS-NET controller unit can be changed to the following:

- Always OFF
- Always ON
- Flash when connected

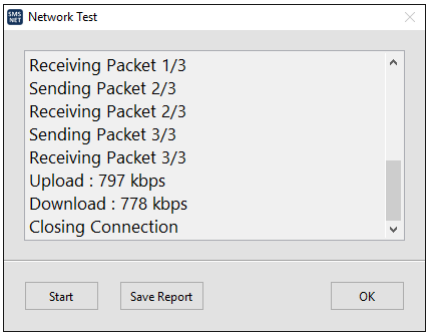
8.11.2 SMS Wi-Fi Setup

The SMS Wi-Fi setup allows to set-up the Network name (SSID), Security type, and password used by the smartSMS-NET unit to connect to the wireless network. This utility requires the smartSMS-NET unit to be connected, it can't be used offline. Refer to section 7 Set Up Networking, p. 42 for more information on installing a wireless network.



Testing Wireless Communication

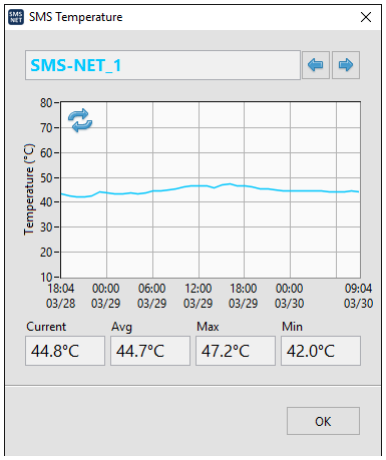
You can test the wireless communication of a unit by clicking on the Test Connection button. The test will send data packets over WiFi and will evaluate the connection quality. The connection transfer speed should be over 200 kbps (over 400kbps is excellent). You can also perform this test on USB to troubleshoot a wireless connection.



8.11.3 SMS On-Board Clock

The smartSMS-NET on-board clock is an optional component used for the volume schedule (section 8.9 Set-Up the Volume Schedule, p. 74) and the LEED schedule (section 8.11.4 SMS Temperature

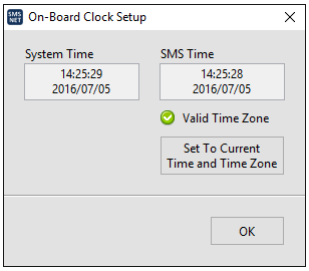
The smartSMS-NET controllers equipped with an on-board clock (optional component) are also equipped with a temperature sensor. This interface allows to view the current temperature and also to see the temperature history (24h, 30 days = 720 values).

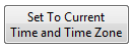


8.11.4 Reboot SMS

This function allows to reboot remotely a smartSMS-NET controller unit.

LEED Schedule, p. 79). This interface allows to set the time and time zone used by the smartSMS-NET controller unit on-board clock.



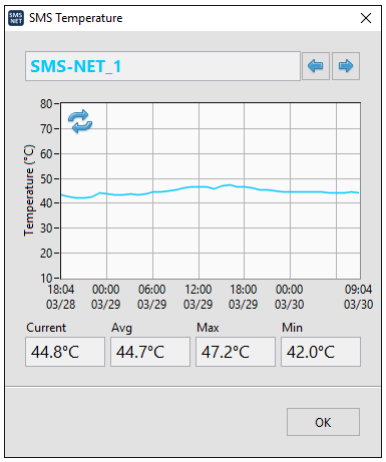
Click on the 

button to adjust the time and time zone to the time parameters of the computer.

IMPORTANT: Make sure the time and time zone used on your computer are valid: they will be used to set the time and time zone on the smartSMS-NET controller.

8.11.5 SMS Temperature

The smartSMS-NET controllers equipped with an on-board clock (optional component) are also equipped with a temperature sensor. This interface allows to view the current temperature and also to see the temperature history (24h, 30 days = 720 values).

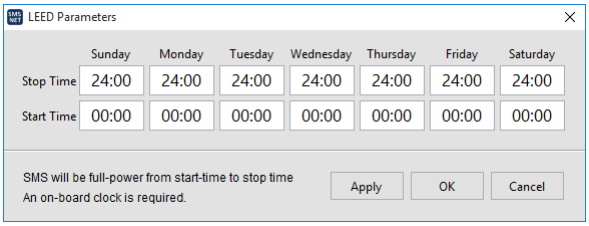


8.11.6 Reboot SMS

This function allows to reboot remotely a smartSMS-NET controller unit.

8.11.7 LEED Schedule

The LEED schedule allows to put the smartSMS-NET unit in low-power mode on a schedule basis.

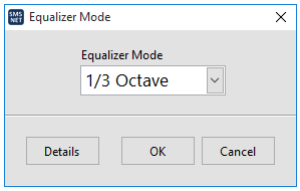


If the unit is to be working normally from 6:00 to 22:00, set the start time to 6:00 and the stop time to 22:00.

IMPORTANT: An on-board clock (optional component) is required to use this function.

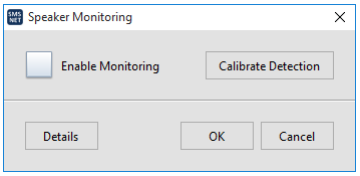
8.11.8 Sound Masking Equalizer Mode

There are 2 sound masking equalizers available, 1/3 octave band and Fine Bands. Both of the equalizers are calibrated at the same time in the calibration process.



8.11.9 Speaker Monitoring

This function allows to set-up the speaker monitoring for the selected output channels. The acoustic speaker monitoring plays a sound on the loudspeakers and this sound is picked-up by the sensors and compared to a reference level.



Click on Calibrate Detection to calibrate the reference level used for detection.

Important: The speaker monitoring needs active control sensors installed and activated on the selected output channel.

Refer to section 9 Implement System Monitoring, p. 83 for more information on monitoring.

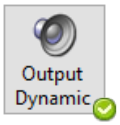
8.11.10Reset SMS Configuration

This function restores the default configuration in the smartSMS-NET controller unit.

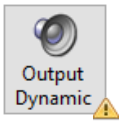
8.12 Output Channel Overview

The Setup Interface offers an output channel overview to see all the current setting values for a specific output channel. Additionally, it displays the available “headroom”. The headroom shows how many decibels are still available before the output saturates.

When the headroom is higher than 3 dB, there is no warning. When the headroom is below 3 dB, a warning is displayed meaning the output is close to saturation. When the headroom is 0 or less, a critical warning is displayed meaning that saturation will occur.



No Warning



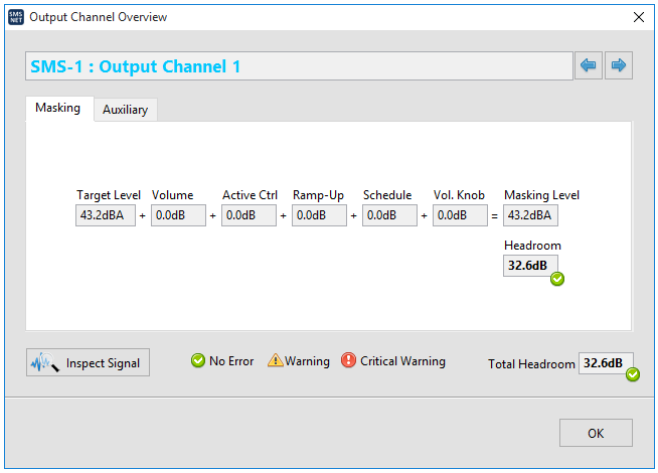
Warning

Critical Warning

- **No Warning**: the output level is OK, no action is required.
- **Warning**: The output level can be close to the maximum limit; review the parameters to identify the cause.
- **Critical Warning**: The output can exceed the maximum limit; review the parameters to identify the cause.

When a warning or a critical warning is detected, click on the 

button to open the output channel overview interface:



8.13 Color Codes in Commissioning Mode

8.13.1 smartSMS-NET Unit Color Overlay

The color overlay of the smartSMS-NET unit indicates the connection status. The smartSMS-NET unit can be connected using USB or Wi-Fi. The table below shows the color overlay code of the smartSMS-NET icon on the layout and its symbol in the project list.

Color Overlay	Linked to the project	Connected (USB or Wi-Fi)
Gray	NO	-
Green	YES	YES
Yellow	YES	NO

If the color overlay is gray, it means that the unit was not linked to a real smartSMS-NET unit. Refer to section 5 Link smartSMS-NET Controller Units, p. 20, for more information on linking smartSMS-NET units.

8.13.2 smartSMS-NET Unit Color Contour

The color contour of the smartSMS-NET unit indicates the updated status.

The parameters of the smartSMS-NET unit can be changed either online or offline. If the unit is online (connected) while making those changes, the unit will be updated automatically. However, if the changes are made while the unit is offline (not connected), the changes will not be updated on the physical unit until it is online again. The status of the unit will be “not updated” until that moment.

The table below shows the color contour code of the smartSMS-NET icon on the layout and its symbol in the project list.

Color Contour	Updated
Green	YES
Yellow	NO

8.13.3 Speaker Line Color

In commissioning mode, the speaker lines are colored to indicate their calibration status. The calibration status refers to the sound masking equalizer calibration status. Refer to section XXX for more information on sound masking equalizer calibration.

Color	Calibrated
Green	YES
Yellow	NO

9 Implement System Monitoring

Once the system is installed and calibrated, it is possible to implement monitoring. The system monitoring feature performs periodic system diagnosis and active control history reporting.

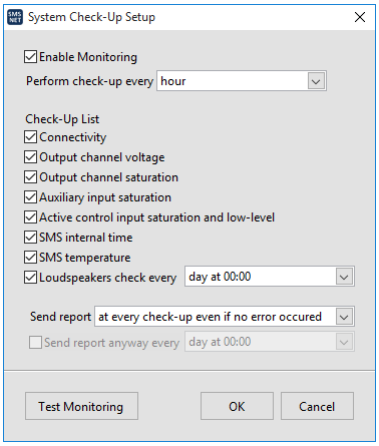
Note: The monitoring feature requires a computer to communicate with the smartSMS-NET controller units.

9.1 Set-Up Automatic System Diagnosis

The system diagnosis process allows to perform a complete diagnosis of the system periodically.

Click on the 

button to set-up the system diagnosis parameters.



Reports can be sent at each diagnosis period or only if an error or warning was detected during the system diagnosis.

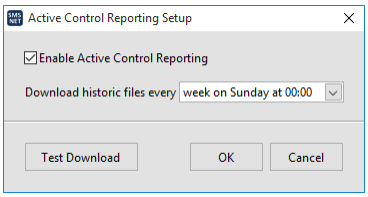
To be sure the periodic system diagnosis is working it can send an “OK” report periodically.

9.2 Set-Up Automatic Active Control History Downloads

The automatic active control history reporting allows to download the history of the sound levels measured by the active volume control sensors. The history files can be opened using the Active Control History Post-Processing Tool (refer to Appendix L, Post-Process Active Control History Files, p. 132). The sound level history provides useful information on the acoustical environment of the office.

Click on the 

button to set-up the active control reporting parameters.

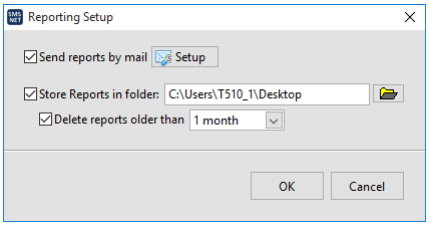


9.3 Set-Up Reporting

The Project Manager software allows to store the reports locally on the computer and/or send them by email.

Click on the 

button to set-up the reporting.



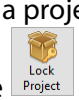
9.4 Start System Monitoring

The system monitoring is a process which runs in the Operation mode. The Operation mode is a simpler interface of the Project Manager for the end-user. For more information on the Operation mode, refer to section 13, Turn the Project Manager Software in a Control Panel, p. 88.

Click on the 

button to start the system monitoring. This operation will lock the interface in Operation mode and start the system monitoring process.

10 Lock Project Configuration

When a project is completed, it can be locked to avoid any unwanted modifications. To do so, click on the 

button from the “Project” tab. This will block access to the “Edition”, “Commissioning” and “Monitoring” tabs when this project is opened. Upon locking a project, a password can be added to increase the security level.

Should you want to unlock the project, click on the 

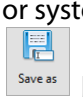
from the “Project” tab. If a password was added, it will be asked.

Note: Contact Soft dB at info@softdb.com if you forget the password.

11 Save and Recall a Project File

11.1 Saving the project file as a *.smsp file

At many points in the process, whether it's during layout edition or system commissioning, you can save different versions of the project file using the 

and 

buttons. This will store the project file as a *.smsp file. There is no relation between the internal project name and the *.smsp file name; you can name the file with any name and the internal project name will remain the same.

It's recommended to save multiple versions of the project file along the process to create backup files.

11.2 Exporting the project file to the master smartSMS-NET controller unit

A copy of the project file can be stored in the master smartSMS-NET controller unit internal memory. This feature is designed to keep a copy of the project file along with the physical system to avoid losing it.

To export the project file on the Master controller unit, click on the 

button from the project toolbar.

11.3 Recalling a project file

A project file can be recalled to restore a system to a known state. For instance at the end of commissioning, it's highly recommended to save a copy of the project file, either by saving a *.smsp file and/or by exporting it on the master unit. That way, should the client experience any problem with the system, this reference copy can be used to restore the system to this reference state.

To recall a project file, simply open the project file using the 

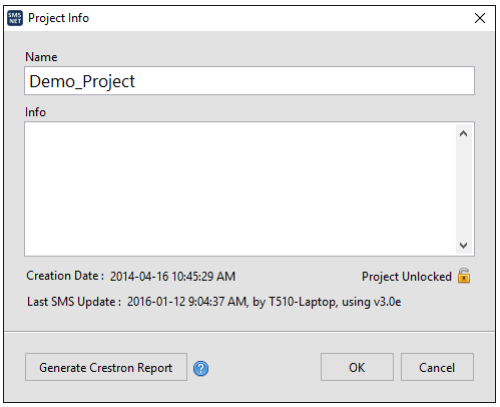
button to load it from a *.smsp file or on the 

button to load the project from the Master smartSMS-NET controller unit. Once the project file is opened, the Project Manager software will synchronise all smartSMS-NET controller units linked to the project.

12 Project Info

Click on the 

button to open the "Project Info" interface:



The available information is:

- Project name: Internal project name that smartSMS-NET controller units relate to.
- Info: Any useful information which the user wants to add to a project file.
- Creation date: Creation date for the project file.
- Project Locked/Unlocked: Indicates if the project configuration is locked.
- Last SMS Update: Indicate the date and time of the last smartSMS-NET controller access and modification. It also indicates which user did the modification (computer name) and which version of the software was used.

This interface also contains a function to create a system report for Crestron integrators. This report includes a layout plan of smartSMS-NET controllers and loudspeakers. Each smartSMS-NET controller is listed in a table along with its physical address (MAC Address). Refer to Appendix K, Generating a Project Report for Crestron Integrator, p. 131 for a sample report.

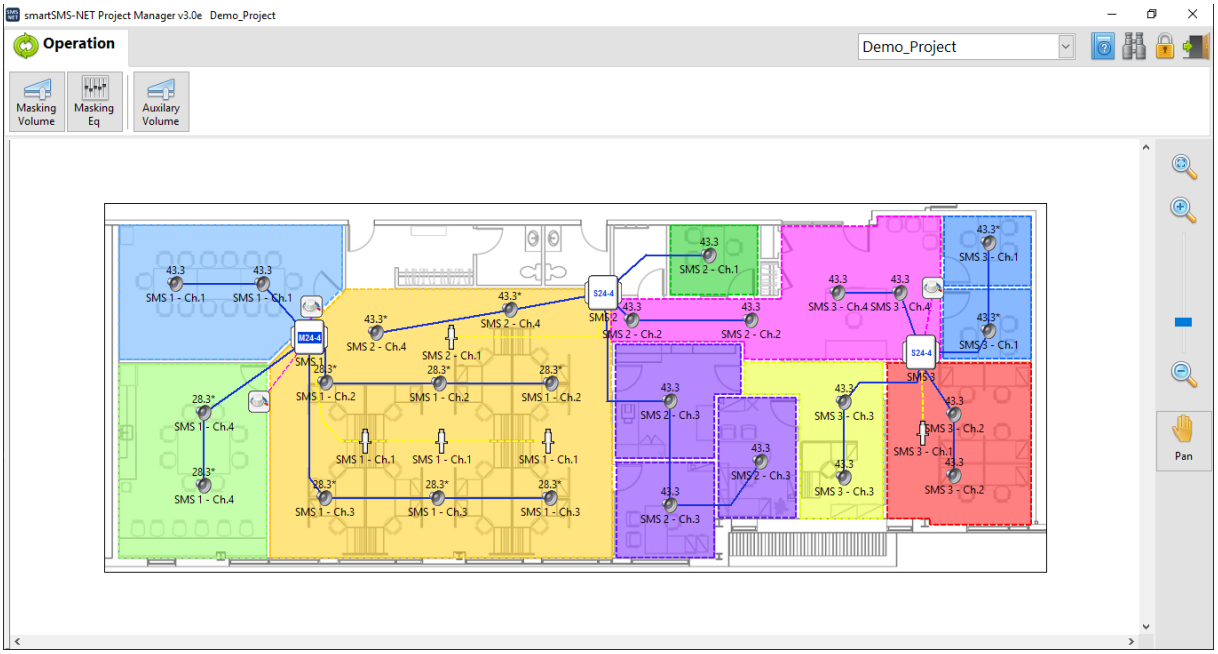
13 Turn the Project Manager Software in a Control Panel

The Project Manager software offers an end-user interface which can be used as a control panel for the smartSMS-NET system. The purpose of this interface is to leave a more simple software interface to unskilled end-users as a control panel. This software mode is called the “Operation Mode”.

Follow these steps to turn the interface in operation mode:

1) Open the project file(s). Note that more than one project files can be opened for multi-project installations such as for buildings with multiple floors.
2) Click on the icon from the quick access toolbar at the top-right corner of the interface
3) You can add a password to prevent the end-user from unlocking the interface.

At the end of these steps, the interface should be locked in operation mode. To unlock the interface, simply click on the icon from the quick access toolbar.



The Operation Mode interface shows only the operation toolbar which contains only basic management functions.

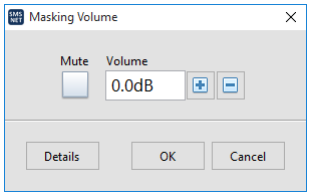
Note: At this point, it’s not possible to close the project or open additional projects. If the Project Manager Software is closed and reopened, it will automatically reopen in “Operation Mode” with the target projects already opened. All operations to save and recall a project are handled automatically without the intervention of the user.

13.1 Change Sound Masking Volume in Operation Mode

This function allows the end-user to change the sound masking volume for a specific zone or group of zones.

1) On the layout select the zone(s), SMS unit(s) or speaker line(s) on which the sound masking volume needs to be changed.
2) Click on the 

button to open the “Masking Volume” interface.
3) Click on the “Volume” field to enter directly the masking volume or click on the “Mute” check-box should the sound masking be muted.

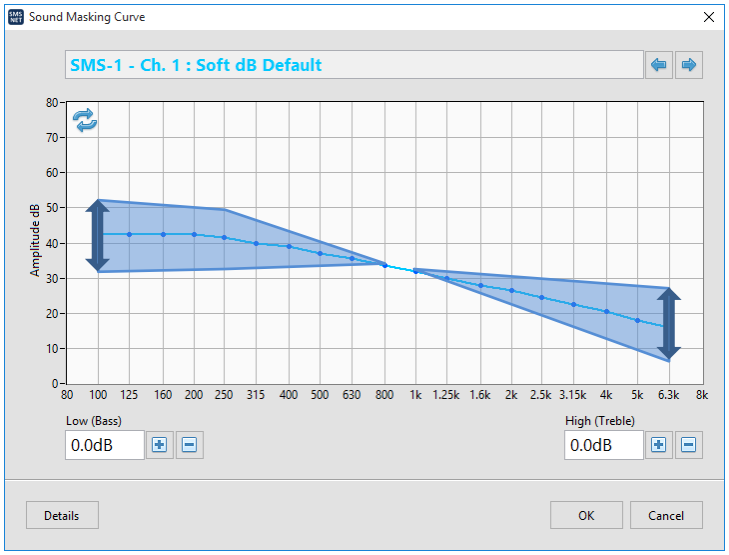


13.2 Change Sound Masking Bass and Treble in Operation Mode

This function allows the end-user to change the sound masking bass and treble for a specific zone or group of zones.

1) On the office layout select the zone(s), SMS unit(s) or speaker line(s) on which the sound masking equalizer needs to be changed.
2) Click on the 

button to open the “Masking Eq” interface.
3) Click on the bass and treble fields to change the low frequency and high frequency gain of the sound masking equalizer.

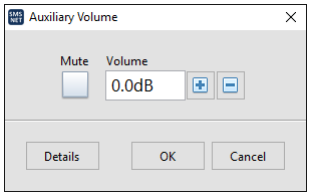


13.3 Change Music/Paging Volume in Operation Mode

This function allows the end-user to change the music and paging volume for a specific zone or group of zones.

1) On the office layout select the zone(s), SMS unit(s) or speaker line(s) on which the auxiliary volume needs to be changed.
2) Click on the 

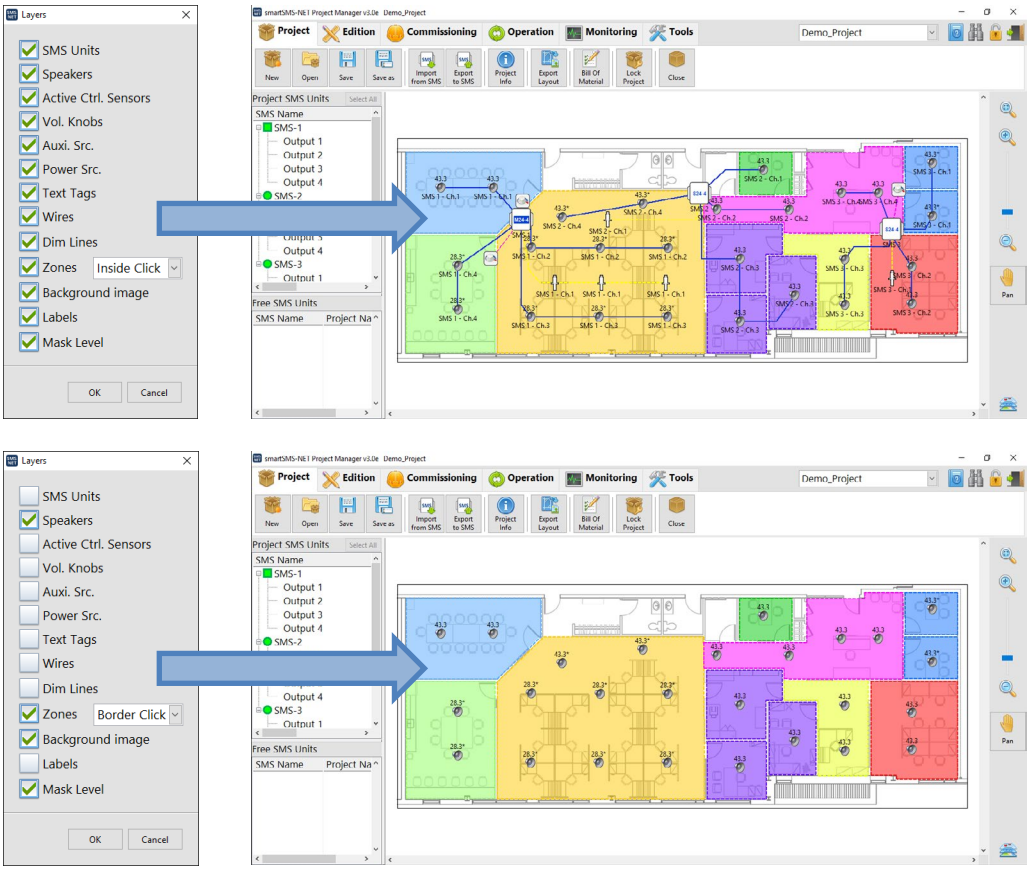
button to open the “Auxiliary Volume” interface.
3) Click on the “Absolute Volume” field to enter directly the auxiliary volume or click on the “Relative Gain” field to enter the gain variation from the current volume. Click on the “Mute” check-box should the music and paging be muted.



13.4 Visible Layers

When leaving the system to the end user, it's a good practice to hide most system components from the layout and only show zones, speakers and masking levels. This way, the end-user only has to select a zone or a speaker to make changes to the system.

Click on the button in the down-right corner of the main interface to open the Layers interface:



Additionally, this interface includes an option for zone selection:

- Border Click – *Click on the border of a zone to select it*
- Inside Click – *Click anywhere in the zone to select it*

The Mask Level indicates the sound masking level over each loudspeaker. An asterisk next to the label indicates that either active volume control, ramp-up, volume knob or schedule is activated on this channel and may affect the sound masking level.

Note: It's important to show/hide layers before turning the interface to operation mode because the "layers" button is not accessible in operation mode.

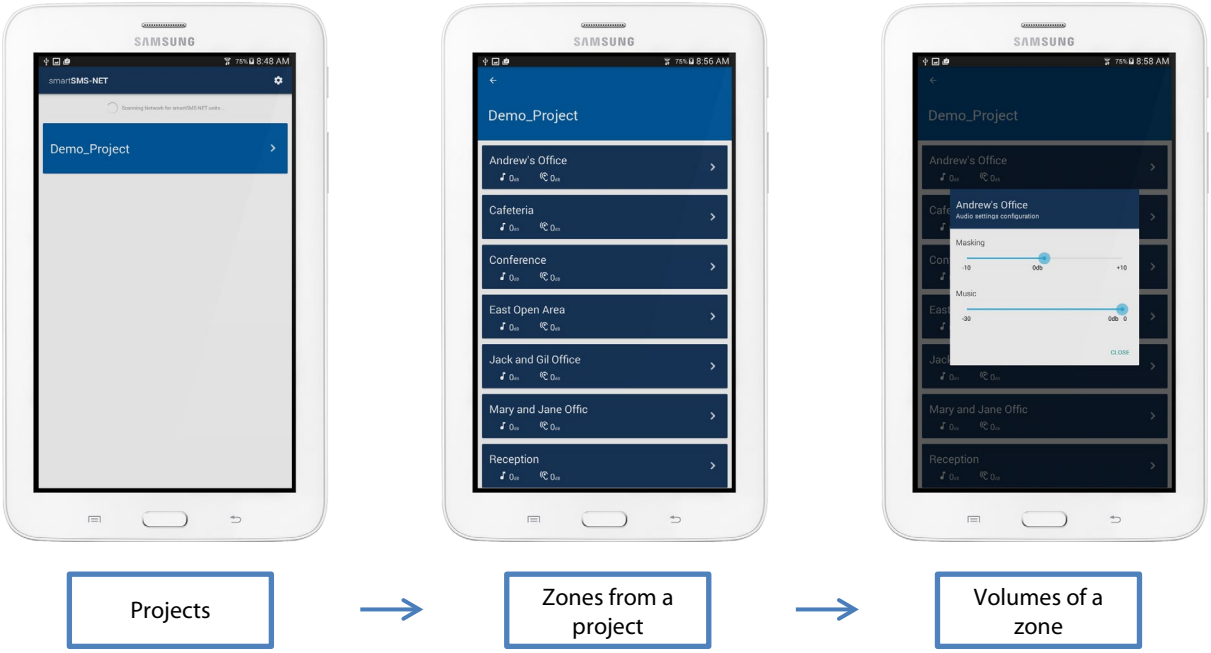
14 Using the Android App

14.1 Basics

An Android app is available to control the volumes of sound masking and music/paging for a smartSMS-NET project.

The app scans the wifi network in search for smartSMS-NET units. Upon scanning a Master unit, the app automatically loads the contained project and displays it in the project list.

Clicking on the project name from the list displays the associated zones and clicking on a zone item offers two sliding controls to change the volume of sound masking and/or music.

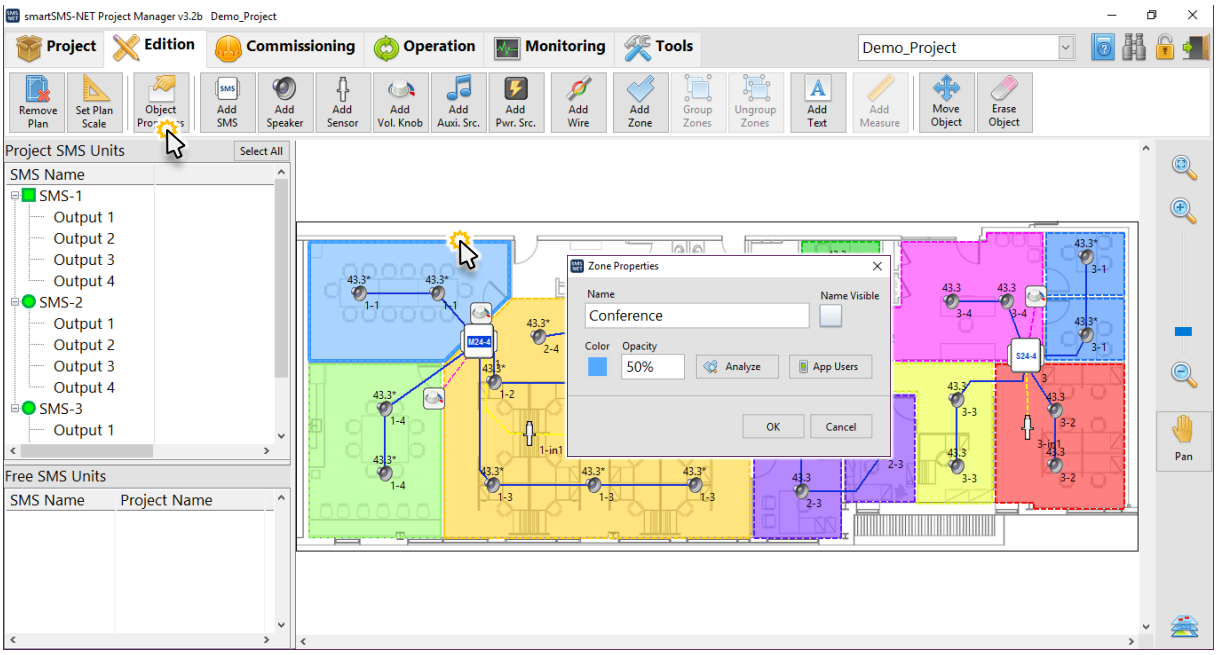


To download the app on your device, search for "smartSMS-NET" in the Play Store.

IMPORTANT: This Android app requires a Wi-Fi network to which the smartSMS-NET controllers are connected. The Android app does not communicate directly to the controllers without an established Wi-Fi network.

14.2 Configuring the smartSMS-NET Project for App Use

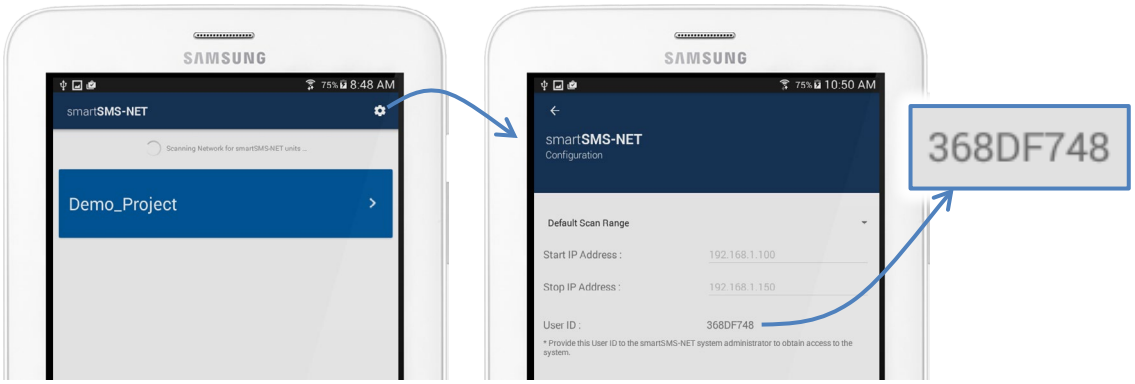
In the Project Manager software, go to the “Edition” tab to configure the zones. Click on the zone(s) you wish to configure and click on the “Object Properties” button.



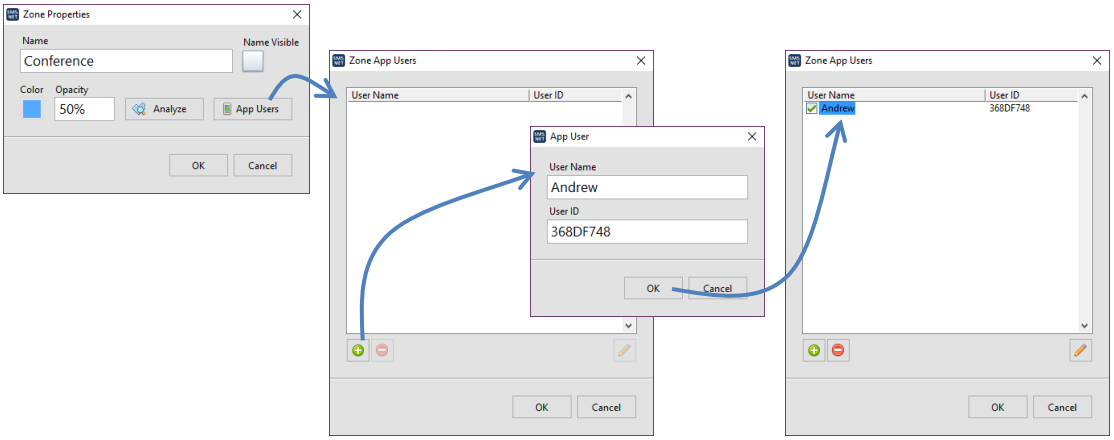
Each zone must be given an appropriate name; this name will be displayed in the zone list in the app.

To control the access to the smartSMS-NET system, each app user must be added to the zone. Perform the following steps to add a user to a zone:

1) On the user device, click the gear icon on the top right corner of the screen to access the Settings screen,
2) On the settings screen, take note of the “User ID”



3) Go back to the Project Manager software,
4) In the “Zone Properties” interface, click on the “App Users” button,
5) Click on the “+” button below the list to add a user,
6) Enter a name for this user as well as the User ID obtained from the user’s device,
7) Click “OK” to accept the change.



IMPORTANT: To update the project settings, the project must be exported on the Master controller unit by clicking on the “Export to Master” button from the project toolbar. Refer to section 11.2, Exporting the project file to the master smartSMS-NET controller unit, p. 86 for more information.

Appendix A smartSMS-NET System Specifications

Sound Masking	
Sound Masking Volume	30 to 88 dBA in 0.1 dB steps and mute
Sound Masking Equalizer	Auto- calibration process on 340 narrow bands or 19 1/3 octave bands from 100Hz to 6.3kHz
Sound Masking Ref Spectrum	13 pre-set sound-masking reference spectrums, unlimited user defined spectrums
Sound Masking Volume Ramp-Up	User defined, up to 30 days

Active Volume Control	
Nb Sensor Inputs	See Controller Model Specifications Below
Max Nb Sensors/Input	See Controller Model Specifications Below
Control	Independent sound masking volume adjustment for each output channel
Masking Volume Change Rate	Adjustable down to 0.1dB steps, updates every 15s
Active Adjustment Range	User defined; maximum range: -7 to +3 dB relative to reference masking level.

Music and Paging	
Music and Paging Inputs	See Controller Model Specifications Below
Music and Paging Mixer	Independent for each output channel
Music and Paging Volume	30 to 88 dBA in 0.1dB steps and mute
Music and Paging Equalizer	18 1/3 octave bands (125Hz to 6.3kHz)

Volume Control Knobs	
Volume Ctrl Knob Inputs	See Model Specifications Below
Volume Ctrl Knob Mixer	Independent for each output channel (Sound Masking and/or Paging and Music)
Volume Range	User defined

Schedule	
Schedule	24 hour periods per day, 7 days
Volume	0.1dB steps
Transition Ramp	Instant, 2m30, 5min, 10min, or 15min
Schedule Mixer	Independent for each output channel (Sound Masking and/or Paging and Music)
Daylight Saving Time	Automatic Adjustment depending on local time zone settings
Clock	On-Board Clock required see Model Specifications Below (or Computer running Project Manager Software)

Monitoring
24/7 system diagnosis (requires computer running Project Manager Software)

Connectivity	
Connectivity	USB, Wi-Fi or Ethernet, See Model Specifications Below
Wifi	WPA/WPA2 Personal or WEP, Wifi radio module can be disabled if not required

Power	
Input	24 VDC
Maximum Power	See Model Specifications Below
Available Power-Supply	50W, 120W and 160W (Higher power needed when powering multiple controllers)

Warranty	
Warranty	5 years

Certifications – ETL Listed 3191772
UL 60065 / ULC 60065 – Standard for Audio, Video and Similar Electronic Apparatus – Safety Requirements
UL 2043 – Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces
FCC – EN 55103-1&2 – Electromagnetic compatibility-Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use - Part 1: Emissions, Part 2: Immunity

Related ASTM Standards
ASTM E1374-06 (11) – Standard Guide for Open Office Acoustics and Applicable ASTM Standards
ASTM E1573-09 – Standard Test Method for Evaluating Masking Sound in Open Office Using A-Weighted and One-Third Octave Band Sound Pressure Levels
ASTM E1130-08 – Standard Test Method for Objective Measurement of Speech Privacy in Open Offices Using Articulation Index
ASTM E2638 – Standard Test Method for Objective Measurement of Speech Privacy Provide by Closed Rooms

Controller Model	M24-4ch	S24-4ch	M12-2ch	S12-4ch	R120-4ch	ML48-8ch	SL48-8ch	SL24-8ch	ML24-4ch	SL24-4ch	RL200-8ch	RL120-4ch	RLCTL-8ch
Picture													
Output Channels	4	4	2	4	4	8	8	8	4	4	8	4	8
Max Speakers/Channel	6	6	6	3	30	6	6	3	6	6	30	30	75[3]
Max Spkrs./Controller	24	24	12	12	120	48	48	24	24	24	200	120	600
Active Vol. Ctrl. Inputs[1]	2 (1 shared)	2 (1 shared)	2 (1 shared)	2 (1 shared)	2	8 (4 shared)	8 (4 shared)	8 (4 shared)	4 (4 shared)	4 (4 shared)	8 (4 shared)	4	8 (4 shared)
Max Nb Sensor / Active Input	3	3	3	3	3	6	6	6	6	6	6	6	6
Music/Paging Inputs[1]	2 (1 shared)	2 (1 shared)	2 (1 shared)	2 (1 shared)	2	4 (4 shared)	4 (4 shared)	4 (4 shared)	4 (4 shared)	4 (4 shared)	4 (4 shared)	4	4 (4 shared)
Volume Ctrl. Inputs	2	2	2	2	2	2	2	2	2	2	2	2	2
USB	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wifi[2]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ethernet	×	×	×	×	×	✓	✓	✓	✓	✓	✓	✓	✓
Form Factor	Mini-Plenum	Mini-Plenum	Mini-Plenum	Mini-Plenum	Rack-Mount	Mini-Plenum	Mini-Plenum	Mini-Plenum	Mini-Plenum	Mini-Plenum	Rack-Mount	Rack-Mount	Rack-Mount
Max Power	25W	25W	15W	15W	120W	50W	50W	25W	25W	25W	200W	120W	15W
Can be a Project Master?	YES	NO	YES	NO	YES	YES	NO	NO	YES	NO	YES	YES	YES
On-Board Real-Time Clock	Optional	Optional	Optional	Optional	Optional	Included	Included	Included	Included	Included	Included	Included	Included

1: A shared input can be an active volume control sensor input OR a paging/music input.

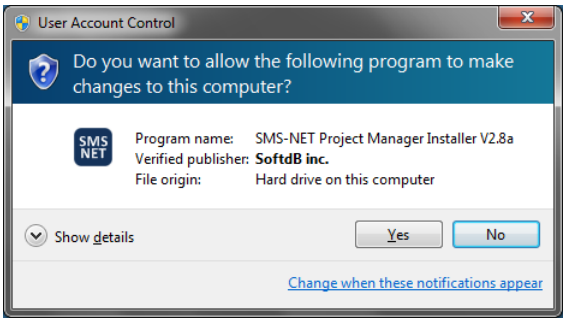
2: Wifi module can be disabled if it's not required

3: The RLCTL-8ch does not include power amplifiers. An external audio amplifier must be used in conjunction with the RLCTL-8ch to drive loudspeakers. A maximum of 75 loudspeakers is recommended to avoid large uneven zones.

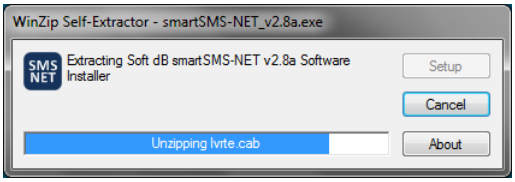
Appendix B smartSMS-NET Project Manager Software Installation

Download the software installer using this link: www.softdb.com/software.php?smartsms-net

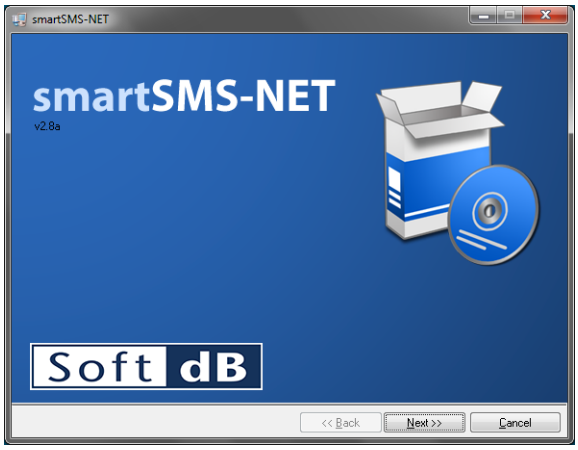
Double-click on the installer executable to extract the software installer:



Click "Yes" on the User Account Control to allow the software to be installed (administrator rights required)

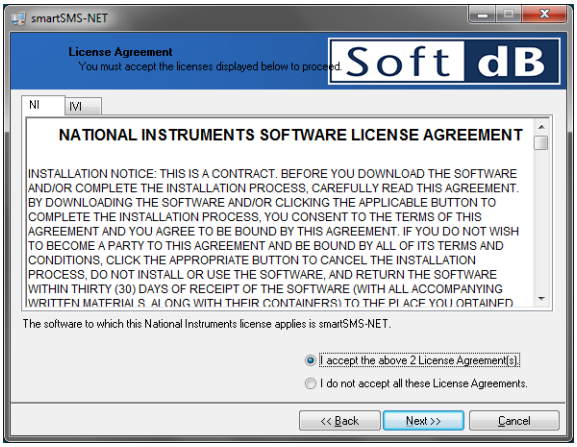


Once the Installer is extracted and opened, click on “Next”:

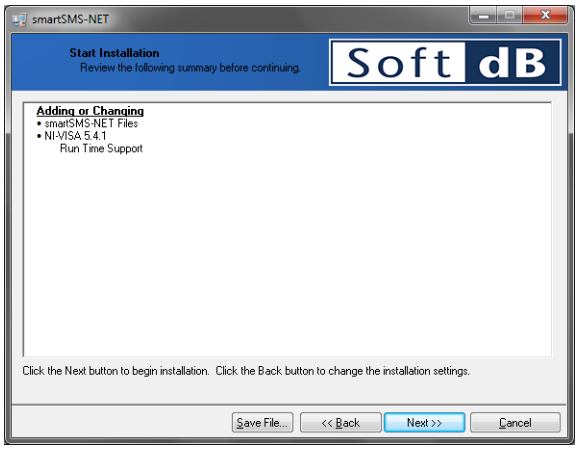


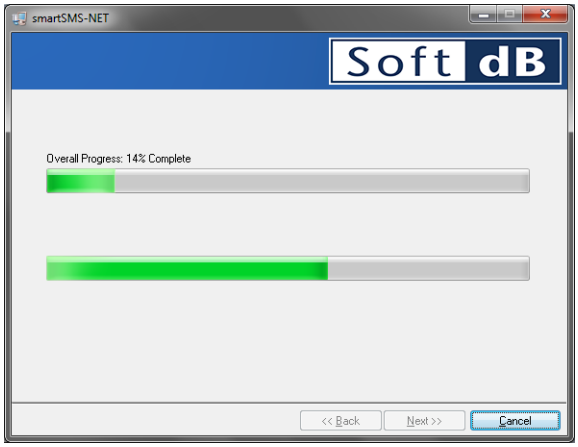
Click on “Next” to select the install directory:

Check “I accept the license agreement” and click “Next”:

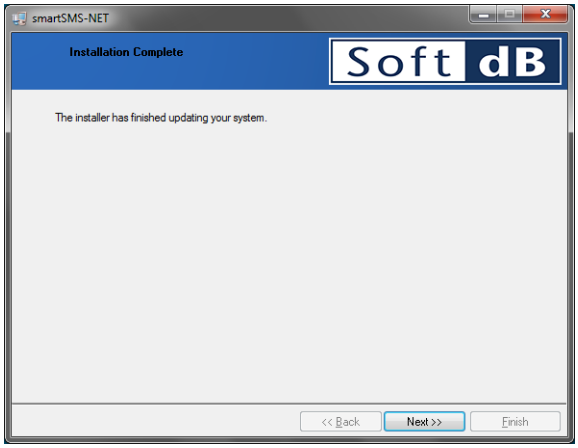


Click “Next” to start installation:



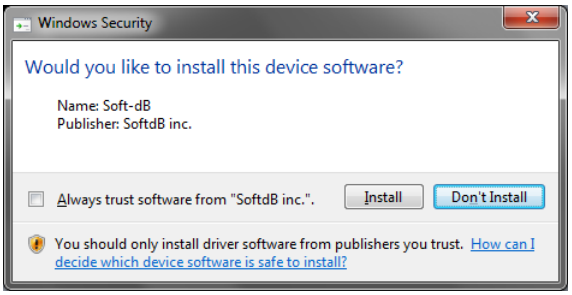


Click on “Next” to finish installation

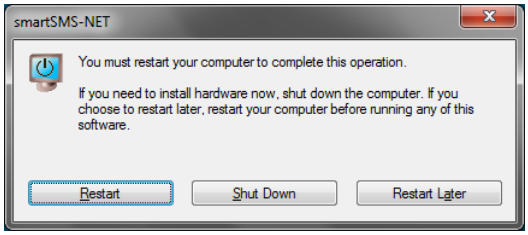


After the installation, the drivers are installed:

Click on “Install” to install the drivers (administrator rights required)



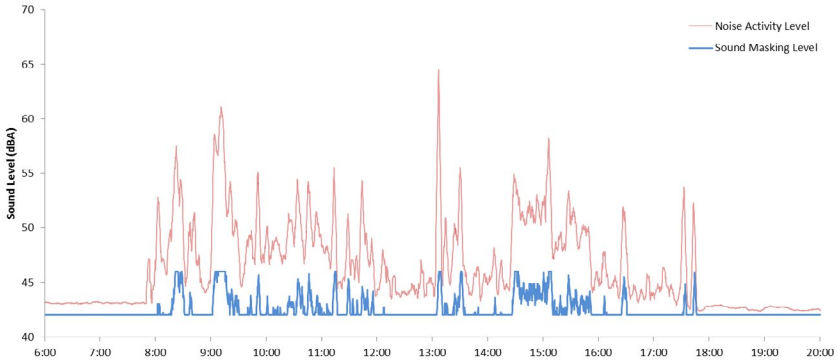
Restart the computer to use the software:



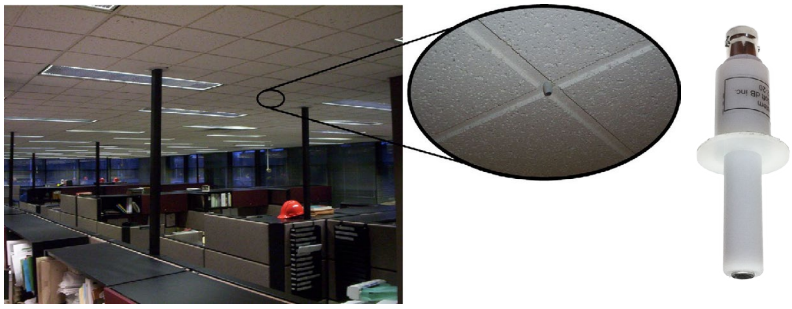
Appendix C Sound Masking Active Volume Control

The smartSMS-NET active sound masking volume control allows the level of the masking sound to be automatically adjusted depending on the noise activity in the room.

When the noise activity in the room is high (people speaking and making noise) the sound masking level increases and when the noise activity is low (quiet environment) the sound masking level is lower.



The technique defines the sound masking volume adjustment according to the noise activity in the room measured by noise sensors installed on the suspended ceiling.



The shape of the resulting spectra in the room does not change. The target masking spectrum is only shifted up and down.

This adjustment is possible due to an advanced signal processing technique that can precisely distinguish the activity in the room from the sound masking. This distinction is essential to achieve a stable and accurate control of the output volumes.

The active control can be achieved independently in different zones of the masking sound system.

Appendix D smartSMS-NET System Networking

A-D.1 Specifications

The smartSMS-NET system offers a wide range of networking capabilities with Wi-Fi and Ethernet Interfaces. The following list indicates the relevant specifications:

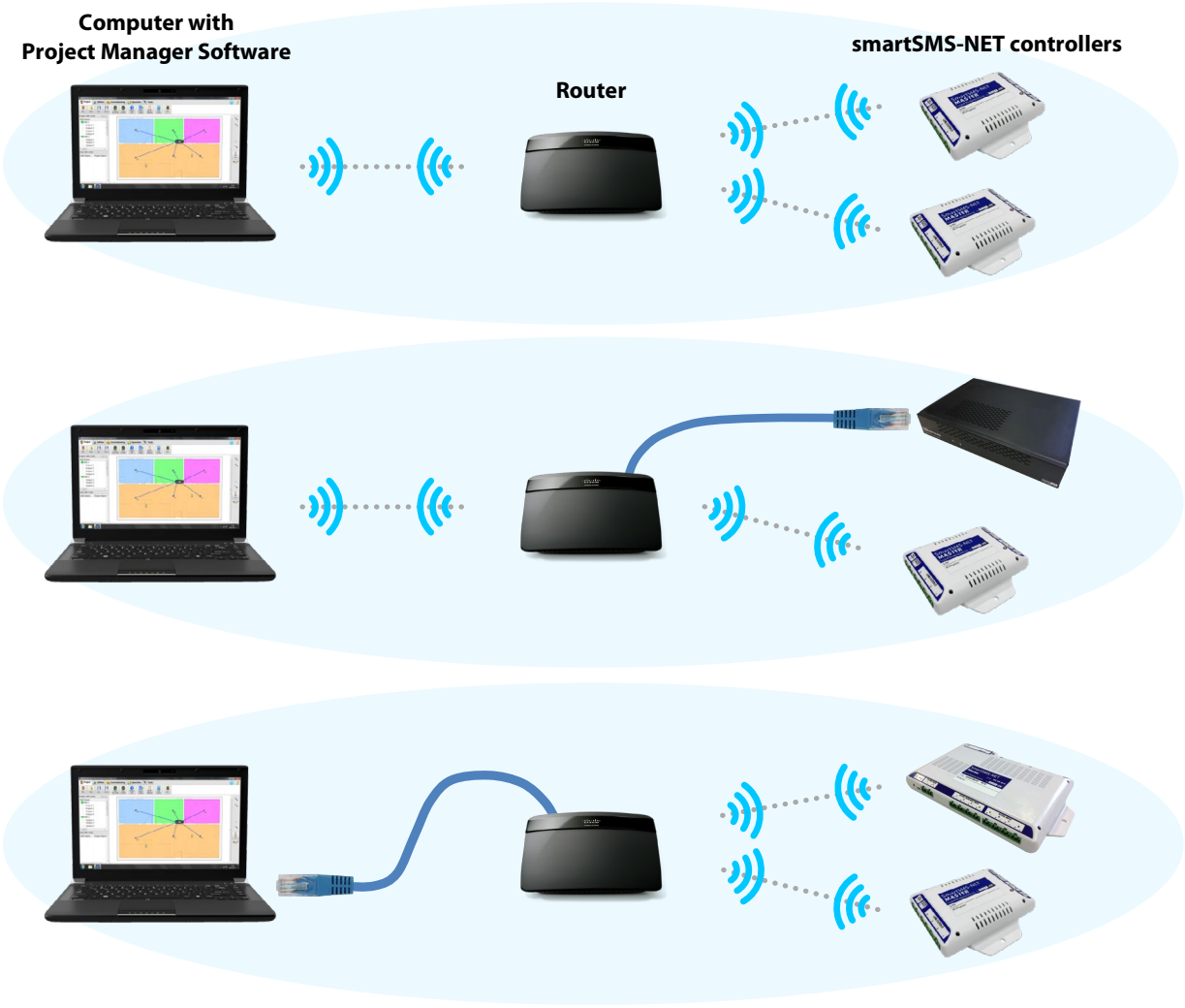
General Specifications	
Configuration	DHCP
Protocol	Proprietary communication protocol layer based on standard TCP/IP protocol

Wi-Fi Interface	M24-4ch, S24-4ch, M12-2ch, S12-4ch, R120-4ch	ML48-8ch, ML24-4ch, RL200-8ch
WLAN Mode	802.11b	802.11b/g/n
Security	WEP 40/64-bits or WPA/WPA2 personal	
Bandwidth	350 kbps	450 kbps
Data Rate	Max 1 Mbps	Up-To 54 Mbps

Ethernet Interface	M24-4ch, S24-4ch, M12-2ch, S12-4ch, R120-4ch	ML48-8ch, ML24-4ch, RL200-8ch
Bandwidth	No Ethernet Port Available	350 kbps

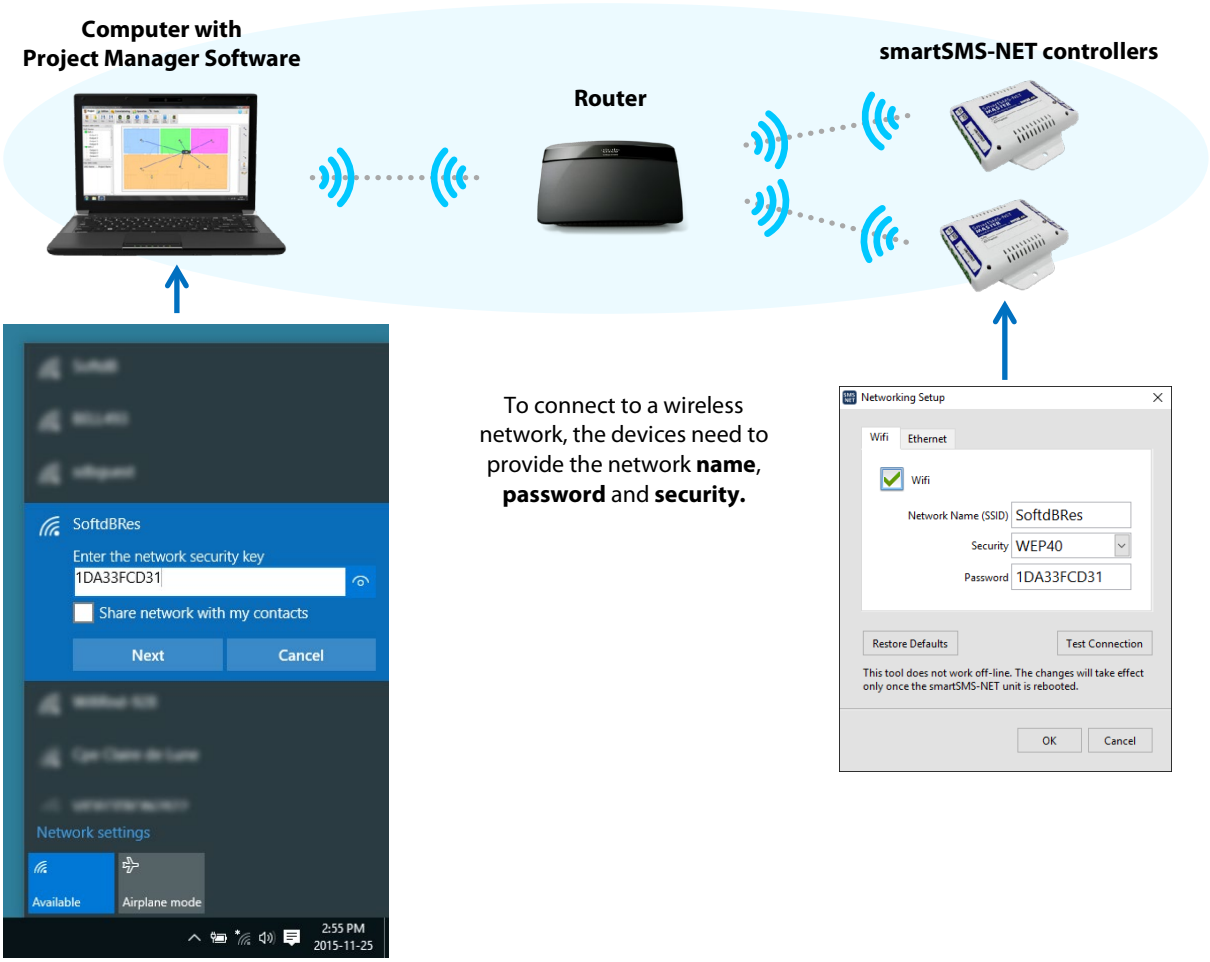
A-D.2 Basics of Networking

It is required to use a router to establish the network through which the smartSMS-NET controller units and the computer (with the Project Manager software) will communicate. The link between the router and each device can be either wireless or wired depending on the available interface on the router, computer and controllers. The following figures show different configurations using wireless network, wired network or a combination of both. Many configurations are possible; the ones shown below are only a small subset of all possible configurations.



A-D.3 Notes on Wireless Networks

To connect to a wireless network, a device needs to know the **name** of the network, the **password** and the **security** encryption type. Hence, the controllers need to know this information to correctly connect to the wireless network. The computer also requires this information when accessing the wireless network:



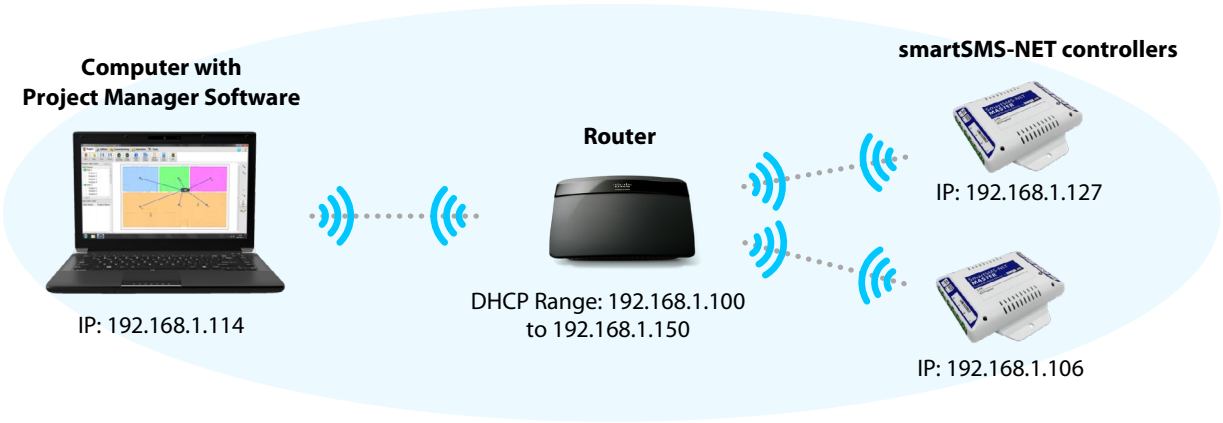
A-D.4 Notes on Wired Networks

To connect to a wired network, the devices **do not have to specify the name and security** because they are physically connected. Hence the connection is automatic as soon as a cable is connected from the device to the router.

Hence, to connect a smartSMS-NET controller to a wired network, you just have to connect an Ethernet cable from the smartSMS-NET controller to the router. Note that not all smartSMS-NET controllers are equipped with an Ethernet cable port. Refer to section 6.2.1, Controller Units Connections, p. 26 for more information.

A-D.5 Notes on IP Addresses

Once a device is connected to the network (whether on a wired or wireless network) it receives an IP address from the router. The router automatically attributes these IP addresses within a range of address which is typically **192.168.1.100** to **192.168.1.150**. The following figure shows an example:

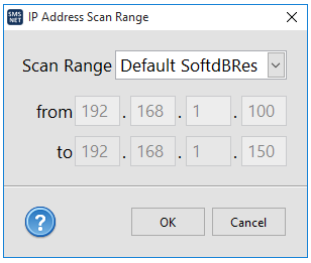


The range used by the router for automatic IP attribution is called the DHCP range. Using the range 192.168.1.100 to 192.168.1.150, up-to 50 devices can be connected at the same time on the network. The range could theoretically be extended up-to 254 devices from 192.168.1.2 to 192.168.1.255. Note that 192.168.1.1 is the IP address of the router itself.

To find the smartSMS-NET controllers on the network, the Project Manager software needs to query each IP address within the DHCP range. Once a smartSMS-NET controller is discovered, it becomes available in the Project Manager software.

Click on the 

button from the "Tools" toolbar to select the appropriate IP range.



- Default SoftdBRes: Range used by Soft dB pre-configured router (192.168.1.100 to 150)
- Automatic: Range guessed from computer IP address
- Manual: Range manually entered for specific situations

A-D.6 Soft dB Pre-Configured Router

A pre-configured router is available from Soft dB to establish a network. When powered-on, the router automatically establishes a network with the following parameters:

- Model: Linksys WRT160N, E900/N300 (or other compatible version)
- Base Address: 192.168.1.1
- Login: admin
- Password: admin
- Wi-Fi Name: SoftdBRes
- Wi-Fi Security: WEP 40/64-bits (10 hex digits)
- Wi-Fi Password: 1DA33FCD31
- DHCP Range: 192.168.1.100 to 192.168.1.150

You can also configure your own router. Refer to A-D.10 Configure a Router with the Default Parameters, p. 114 for more information.

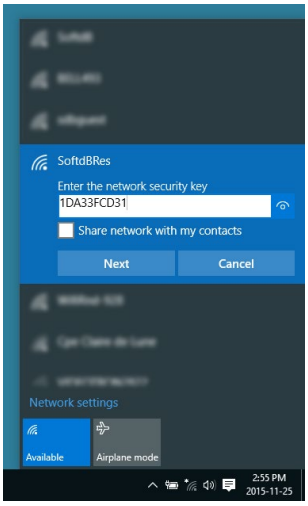
The smartSMS-NET controllers are configured in factory with the same Wi-Fi parameters so that they connect automatically to this Wi-Fi network.

A-D.7 Create a Basic Network

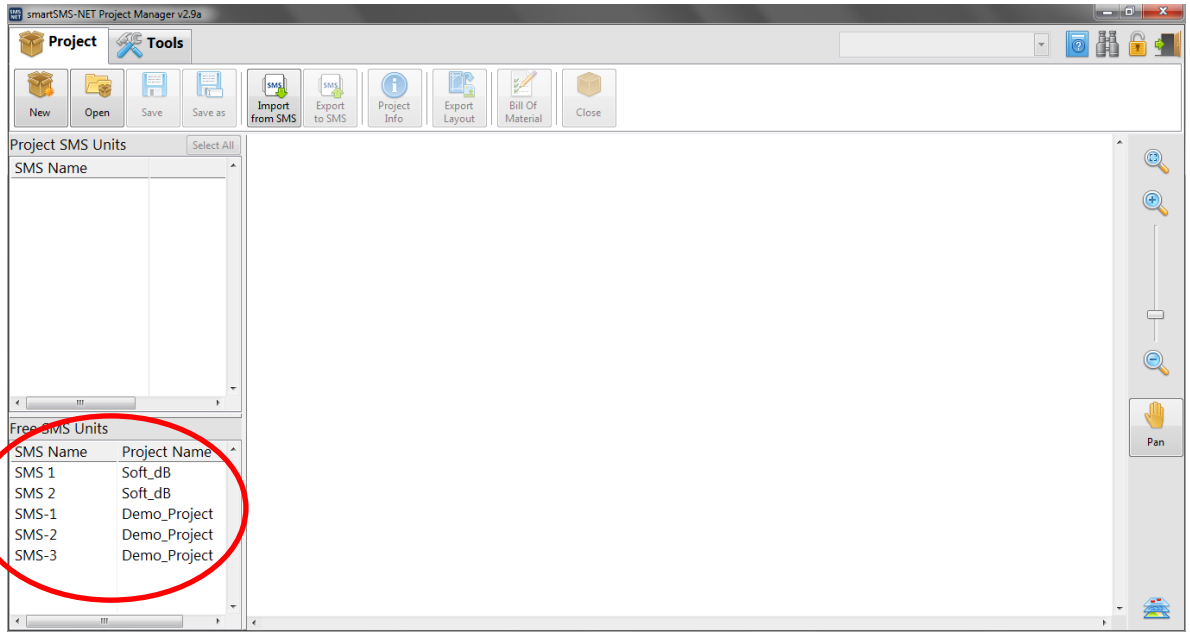
The basic wireless network setup is mainly used to set-up the system parameters during commissioning (calibrate masking equalizers, etc.)

- Step 1: Connect the **pre-configured wireless router** to a power outlet to establish the wireless network. Make sure the wireless network can be reached by the smartSMS-NET controller units as well as the computer. The coverage distance of the Wi-Fi network is about 50 m (165') but it can be affected by barriers such as walls and floor/ceiling assemblies.

- Step 2: Connect the computer to the **SoftdBRes** wireless network using password **1DA33FCD31**:

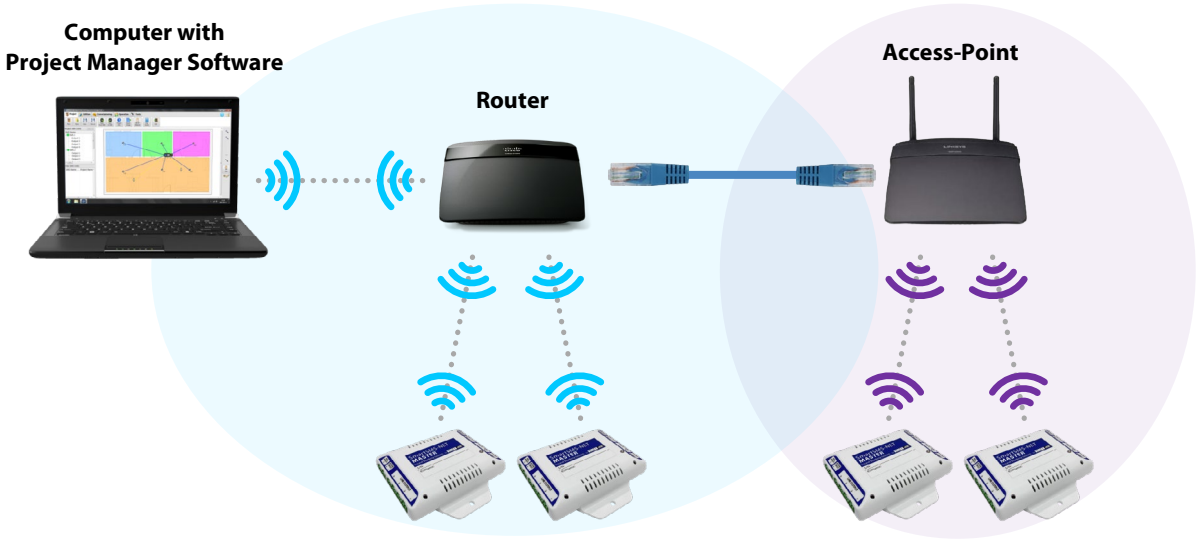


- Step 3: Open the Project Manager software and wait for smartSMS-NET units to be detected. It can take a few seconds until the smartSMS-NET units show up in the software.



A-D.8 Create an Extended Network using an Access-Point

This setup is used when some smartSMS-NET units are not in reach of the wireless network from the router. This may be caused by a great distance between the SMS-NET units and the router or by structural barriers such as walls and floor/ceiling assemblies. In this case, it is recommended to use an access-point to extend the wireless network range.



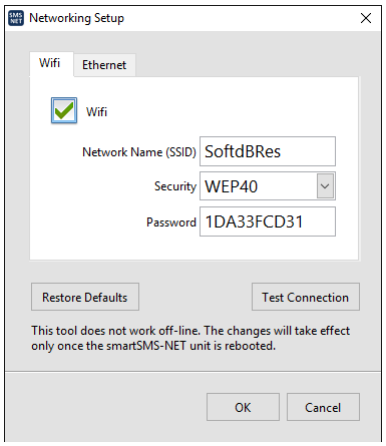
- Step 1: Establish a basic wireless setup (refer to section A-D.7 Create a Basic Network, p. 108)
- Step 2: Configure an access-point with a different network name such as **SoftdBRes_2**. For more information on how to configure an access-point, refer to A-D.11 Configure an Access-Point, p. 117.
- Step 3: Connect the access-point to the wireless router using a network cable.

- Step 4: Configure the smartSMS-NET controller units to go under the access-point wireless network with the appropriate network name:
  a) Connect each smartSMS-NET controller to the computer using a USB cable

b) Access its wireless network setup by clicking on the 

from the Tools toolbar in the Project Manager software. For more information on this utility, refer to Appendix H Change a smartSMS-NET Controller Network Setup, p. 127.

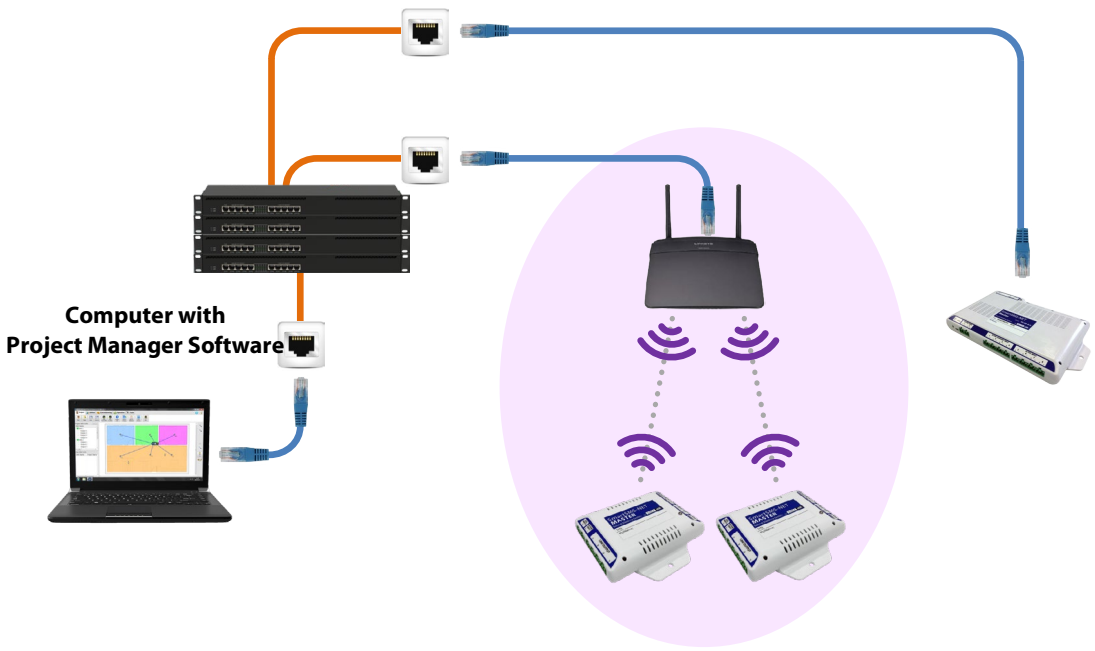
c) Match the network name used by the smartSMS-NET unit to match the network name of the access-point :



At this point the access-point should be appropriately configured and connected to the router. It should broadcast another wireless network named SoftdBRes_2 and the targeted smartSMS-NET controller units should be correctly configured and connected on this network.

A-D.9 Connect to an Existing Network

This setup is used when a permanent network is required for 24/7 access through an existing network.

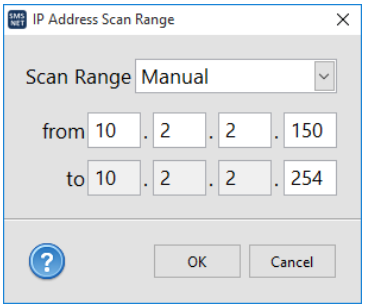


- Step 1: Contact the IT manager to receive the authorisation to connect wireless access-point(s) to the network.
- Step 2: Ask the IT manager for the parameters to use to configure the access-point(s):
  - Network Name (SSID),
  - Security (WEP or WPA personal),
  - Password.
- Step 3: Configure the access-point(s) using the provided parameters. For more information on how to configure an access-point, refer to A-D.11 Configure an Access-Point, p. 117.
- Step 4: Connect the access-point(s) to the client's network using a network cable.
- Step 5: Configure the smartSMS-NET units to connect to the access-point wireless network using the "SMS Wifi Setup" utility from the Tools toolbar of the Project Manager software. For more information on this utility, refer to Appendix H Change a smartSMS-NET Controller Network Setup, p. 127.
- Step 6: Ask the IT manager for the DHCP range of the network.
- Step 7: Configure the Project Manager software with the appropriate IP address range provided by the IT manager:

  a) Open the Project Manager software.

b) Click on the 

button from the Tools toolbar.
c) Select "Manual" from the drop-down list
d) Enter the same DHCP IP address range provided by the IT manager



Enter DHCP address range provided by IT Manager

Note: The "Automatic" mode can also be used in this situation. The automatic mode guesses the scan range using the computer IP address provided it uses the same base address as the DHCP range.

IMPORTANT: It is recommended to use dedicated access-points to connect the smartSMS-NET controllers to an existing network. Using the client wireless network may not work due to incompatibilities with the smartSMS-NET Wi-Fi module specifications.

A-D.10 Configure a Router with the Default Parameters

A pre-configured router is available from Soft dB to establish a network. When powered-on, the router automatically establishes a network with the following parameters:

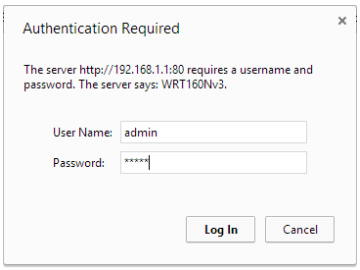
- Model: Linksys WRT160N, E900/N300 (or other compatible version)
- Base Address: 192.168.1.1
- Login: admin
- Password: admin
- Wi-Fi Name: SoftdBRes
- Wi-Fi Security: WEP 40/64-bits (10 hex digits)
- Wi-Fi Password: 1DA33FCD31
- DHCP Range: 192.168.1.100 to 192.168.1.150

WRT160N

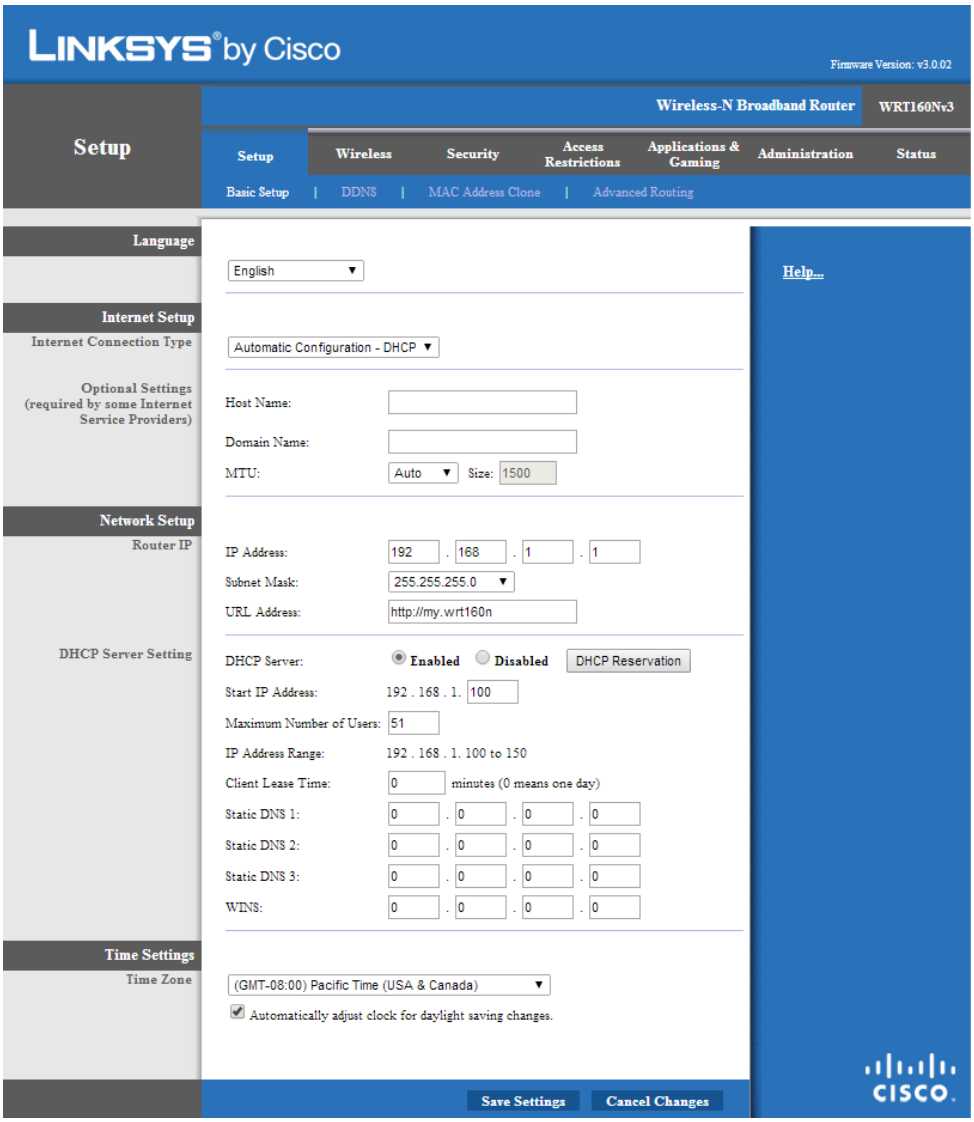
E900/N300

Follow these steps to reproduce the same set-up on a new router

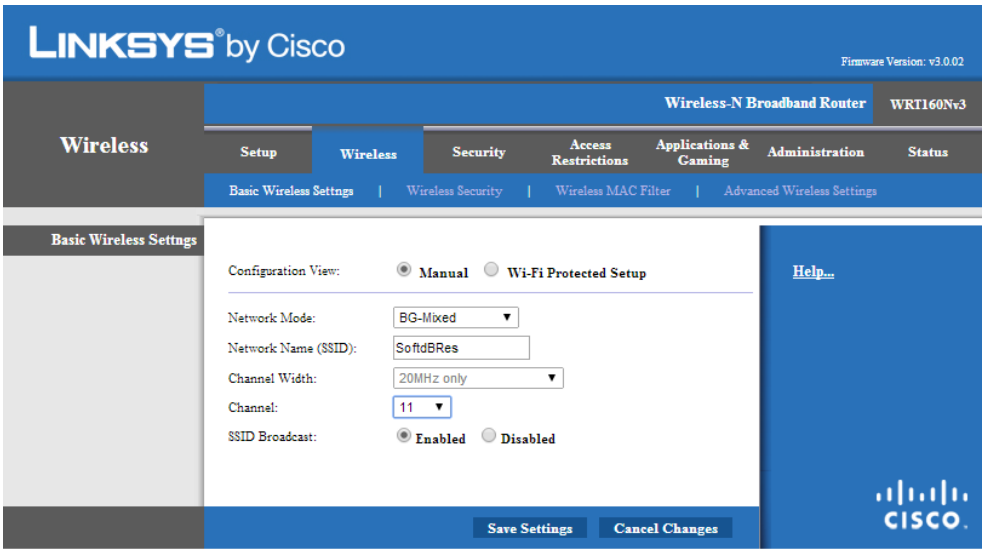
1) Connect the router to a PC using an Ethernet cable in one of the four Ethernet ports of the router.
2) Use an Internet browser to access the router at its base address (type the following IP "192.168.1.1" in the address field of the internet browser).
3) Connect with the User Name *admin* and the password *admin*.



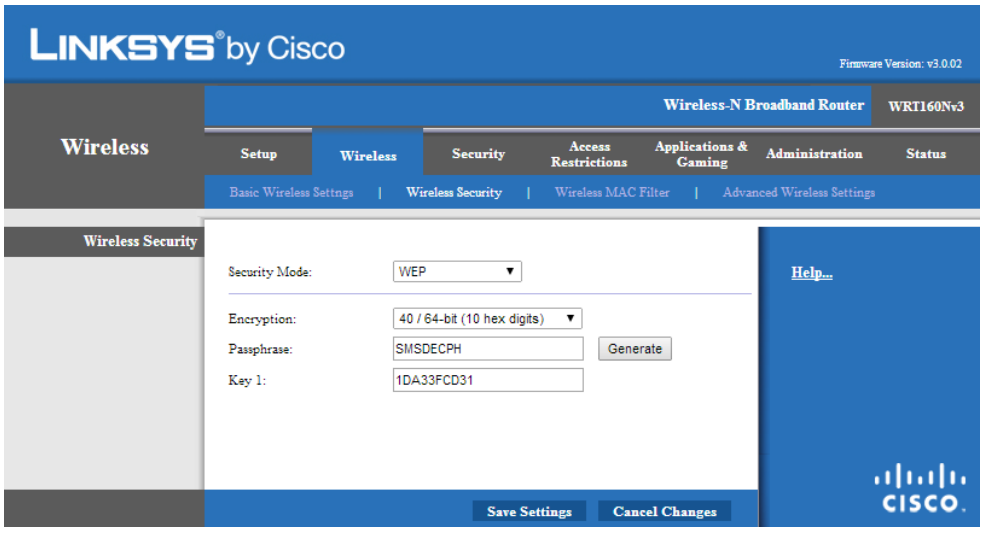
4) Set the basic set-up to force a range of 192.168.1.100 to 192.168.1.150:



5) Activate and configure the Wireless network with the following set-up:



6) Activate the Wireless security with the following set-up:



In general, the router can be used to cover a small installation and all SMS units will be visible at once. If not, a simple solution is to move the router to reach the smartSMS-NET units by group.

If the installation is larger and/or is spread several floors, a more complex network can be built to allow taking the control of all smartSMS-NET units at once.

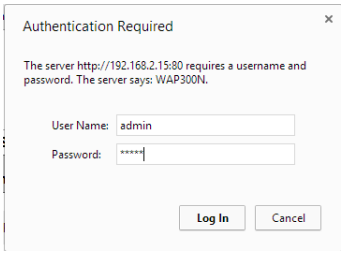
A-D.11 Configure an Access-Point

For a larger installation and if the pre-configured router is not enough to cover the entire building, alternative solutions can be developed. The solutions are based on the use of Ethernet access points (AP) and Ethernet switches connected with the pre-configured router or the main router of the building network. The next sections present these Ethernet devices.

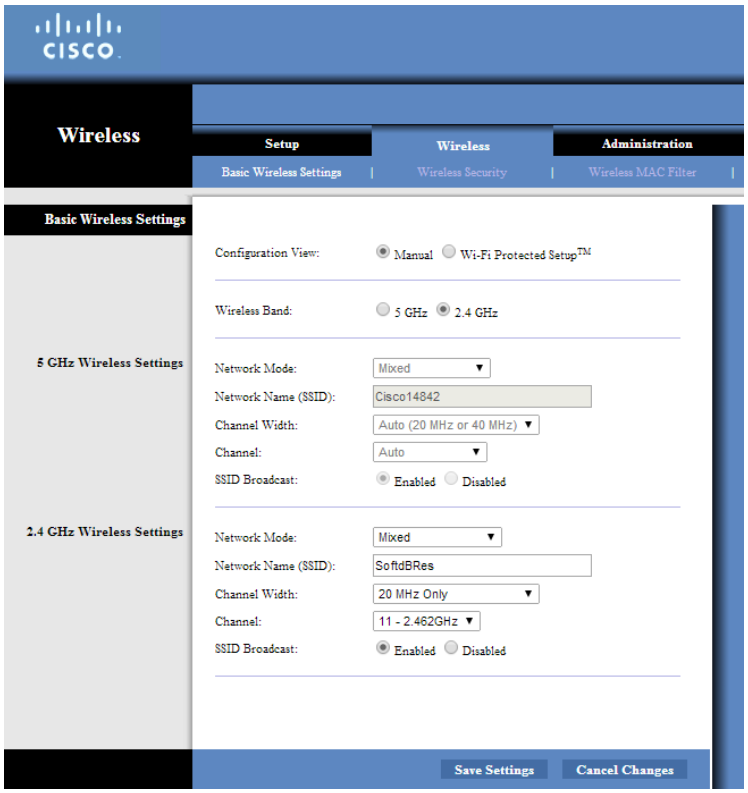
The access points (AP) are wireless devices that can be placed in the building to reach SMS units by group in a way to cover the entire installation. We suggest using the WAP300N from Linksys:

The access point must be configured to allow an automatic connection with the SMS units. Follow these instructions:

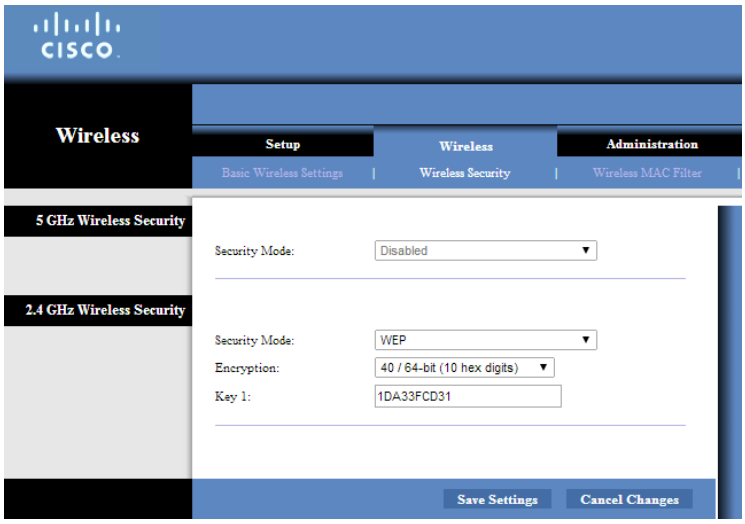
1) If an access point is used, the main router must not have the same SSID (network name) or the Wireless of the router must be disabling to avoid conflicts (set the Network Mode at Disable in the Wireless tab during the configuration procedure of the router).
2) Then connect the access point to one of the four Ethernet ports of the router with an Ethernet cable and use an Internet browser to configure the AP. The IP address of the AP is determined by the main router (go to the configuration address of the router 192.168.1.1 first to know the IP address of the AP in the DHCP tab and the Status function). The user name of the AP is admin and the password is admin.



3) The Wireless network must be set with the following set-up:



4) Set the Wireless security of the access point:



Note that the WEP security mode does not support the Wi-Fi Protected Set-up option. Even if the Manual mode is used, the configuration utility will display a warning message.

A-D.12 Ues Ethernet Switches

The switches can be used when more Ethernet ports are required. The switches can be used as is without configuration. Simply connect the source Ethernet cable from the main router and the access point with the switch. We suggest using the SE1500 from Linksys.

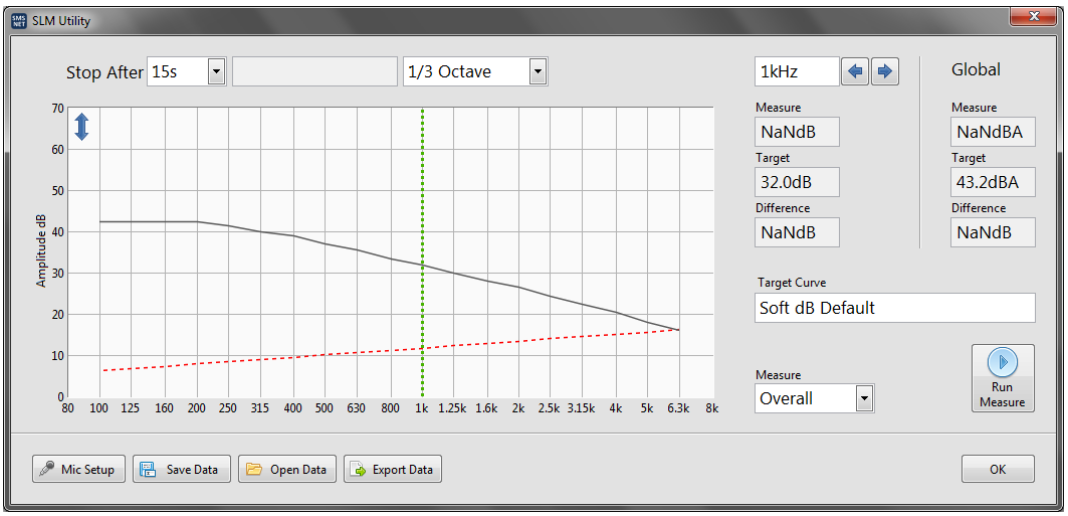
Appendix E Perform Sound Level Measurements

A-E.1 Using the smartSMS-NET SLM Utility

The Project Manager Software includes a sound level meter (SLM) and spectrum analysis utility which is useful during smartSMS-NET system commissioning.

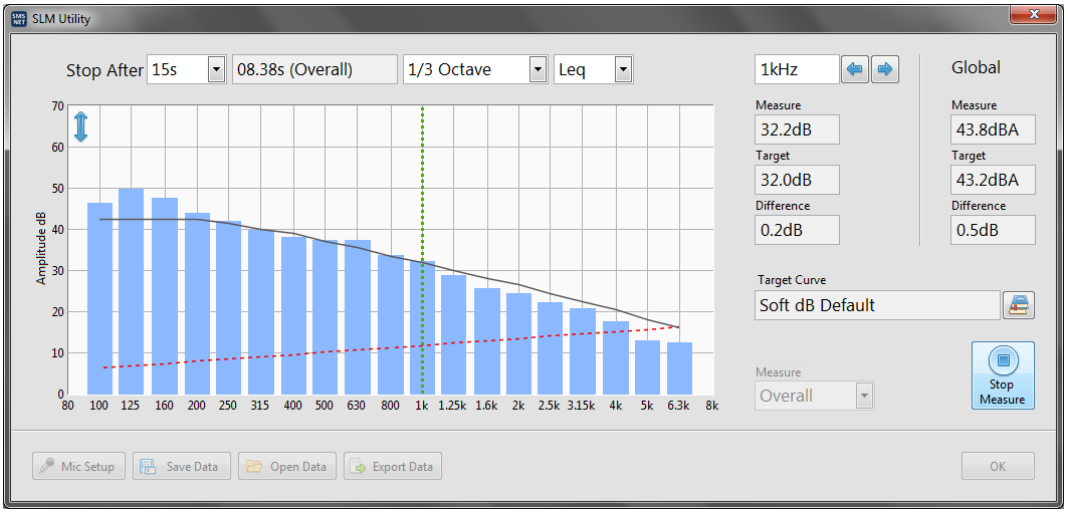
To open the SLM utility, click on the 

button from the "Tools" toolbar of the main interface or from the main setup interface in commissioning mode.

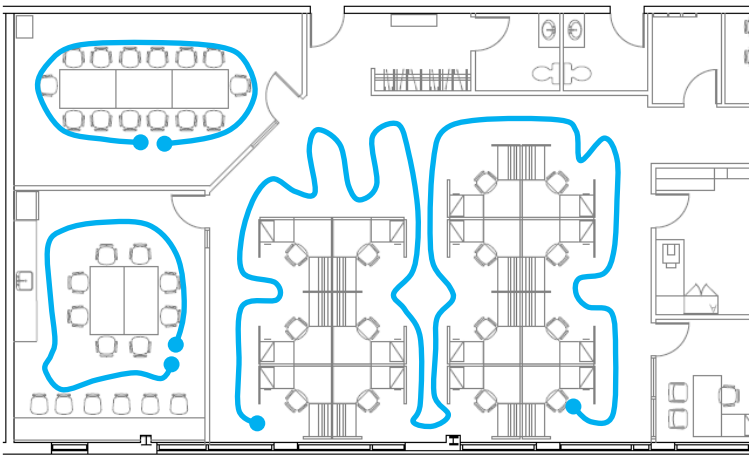


To use the SLM utility you need to have a compatible microphone. For more information on the microphone, refer to Appendix F, Set-Up the Calibration Microphone, p. 124 of this user guide.

Click on the  button to start a measurement.



When performing a sound measurement, it is recommended to move slowly in the room in order to average the ambient sound of the room. Try to cover most of the room area the best you can while moving around the furniture.



A-E.2 Performing an Overall Measurement

An overall measurement is recommended at the end of the installation to measure the overall sound masking level and spectra in a zone.

1) Select the Target Curve against which you want to view the measurement results by clicking on the “Target Curve” field.

2) Select “Overall” from the “Measure” drop-down menu. This will perform an overall average during the measurement.
3) Start the measurement.
4) Walk quietly around the room while the measurement is running.
5) Stop the measurement.
6) Save the results by clicking on the “Save Data” button for documentation.

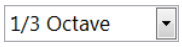
A-E.3 Performing a Live Measurement

A live measurement is recommended to see if the sound masking level and spectra is homogeneous (consistent) in a zone.

1) Select the Target Curve against which you want to view the measurement results by clicking on the “Target Curve” field.
2) Select “Live” from the “Measure” drop-down menu. This will show the live (current) sound level during the measurement.
3) Start the measurement.
4) Walk quietly around the room while the measurement is running and check if the sound spectrum matches the target curve. Identify any location at which the sound spectrum is too high or too low compared to the target curve.
5) Stop the measurement.

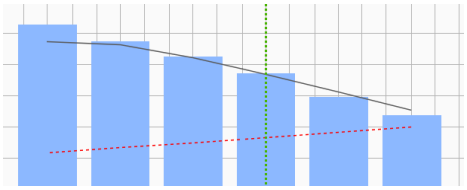
This procedure may be needed in large open areas where the ambient sound environment can be heterogeneous.

A-E.4 Spectrum Types

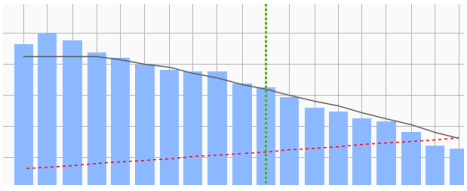
Multiple sound spectrum types are available and can be selected from the 

drop-down menu.

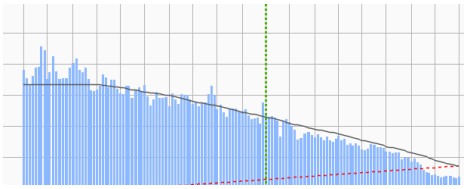
- 1/1 Octave Bands:



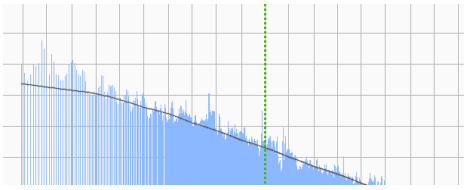
- 1/3 Octave Bands:



- 1/24 Octave Bands:



- Narrow Bands:



A-E.5 Overall Measurement Data Types

Several data types are available for an overall measurement:

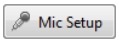
- Leq (Equivalent Sound Level): is the linear average of the sound level. This data type is the most common.
- LN% (Percentile Levels): is the statistical distribution of the sound level:
  - L5% is the sound level exceeded 5% of the time and represents the high sound levels.
  - L50% is the median sound level and is often used to calibrate the sound masking.
  - L95% is the sound level exceeded 95% of the time and represents the background sound level.

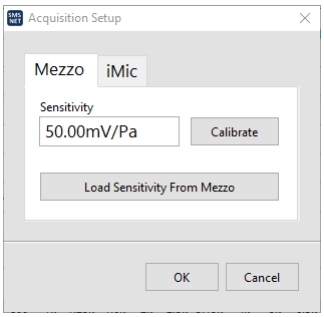
Hint: The difference between L95% and L5% is an indicator of sound level variations during the measurement. If the L5% and L95% are close to each other it means the sound is very constant over the measurement duration. On the other hand, if the L5% and L95% are very far apart, it means that large variations in the sound are present.

Appendix F Set-Up the Calibration Microphone

A-F.1 Using a Mezzo Precision Microphone

The Mezzo is the recommended calibration microphone to use with the smartSMS-NET Project Manager software. Contact Soft dB for more information.

To use a Mezzo microphone with the Project Manager software, click on the  button in the sound masking equalizer calibration interface or in the test measure interface to enter the microphone setup:



If the Mezzo microphone is connected to the PC, you can click “Load sensitivity from Mezzo” to use the sensitivity recorded in the Mezzo microphone memory.

Click on “Calibrate” to automatically adjust the sensitivity using a sound pressure calibrator (optional procedure).

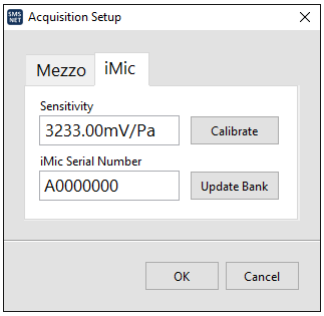
A-F.2 Using an iMic Microphone (Discontinued)

The iMic calibration microphone is discontinued. This section is left for reference only.

The iMic calibration microphone is discontinued. It is recommended to use a Mezzo precision microphone instead.

To use an iMic microphone with the Project Manager software, click on the 

button in the sound masking equalizer calibration interface or in the test measure interface to enter the microphone setup:



Enter the iMic serial number to load the appropriate sensitivity from the microphone bank.

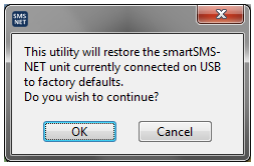
Click on "Calibrate" to automatically adjust the sensitivity using a sound pressure calibrator (optional procedure).

Appendix G Reset a smartSMS-NET Controller Unit to Factory Defaults

Follow these steps to reset a smartSMS-NET unit to the factory defaults:

1) Connect the smartSMS-NET units using a USB cable
2) Click on the 

button from the Tools toolbar in the Project Manager software.



3) Click “OK”.

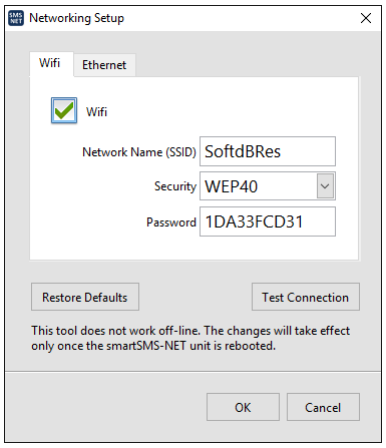
WARNING: This utility will reset all the parameters to factory defaults!

Appendix H Change a smartSMS-NET Controller Network Setup

Follow these steps to change the network setup of a smartSMS-NET unit:

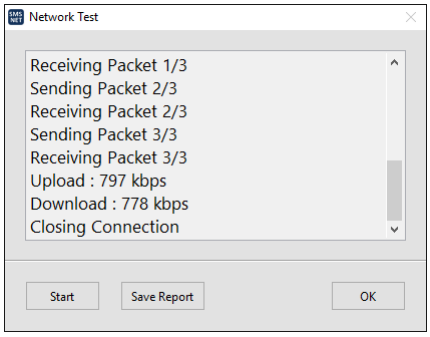
1) Connect the smartSMS-NET units using a USB cable
2) Click on the 

button from the Tools toolbar in the Project Manager software.
3) Enter the Network Name (SSID), Security and Password.
4) Click "OK".



You can test the wireless communication of a unit by clicking on the 

button. The test will send data packets over WiFi and will evaluate the connection quality. The connection transfer speed should be over 200 kb/s (over 400kb/s is excellent).

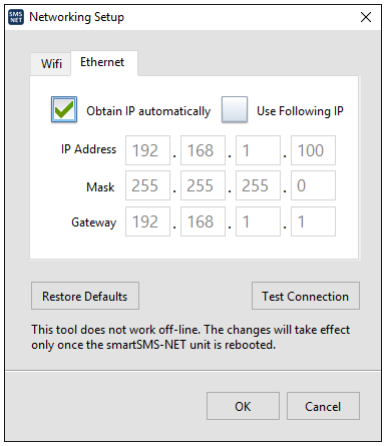


A-H.1 Using a Static IP instead of a dynamic IP

When connecting to an existing network, it may be required to use a static IP for each controller instead of a dynamic IP provided by a DHCP server.

The static IP mode can be used only for the Ethernet port of the controller. The WiFi module only works with a dynamic IP. Also, using a static IP for the Ethernet port automatically disables the WiFi module.

To enter a static IP for a smartSMS-NET controller, select “Use following IP” from the “Ethernet Tab” in the smartSMS-NET controller networking setup interface and enter the static IP, Mask and Gateway used by the smartSMS-NET controller.



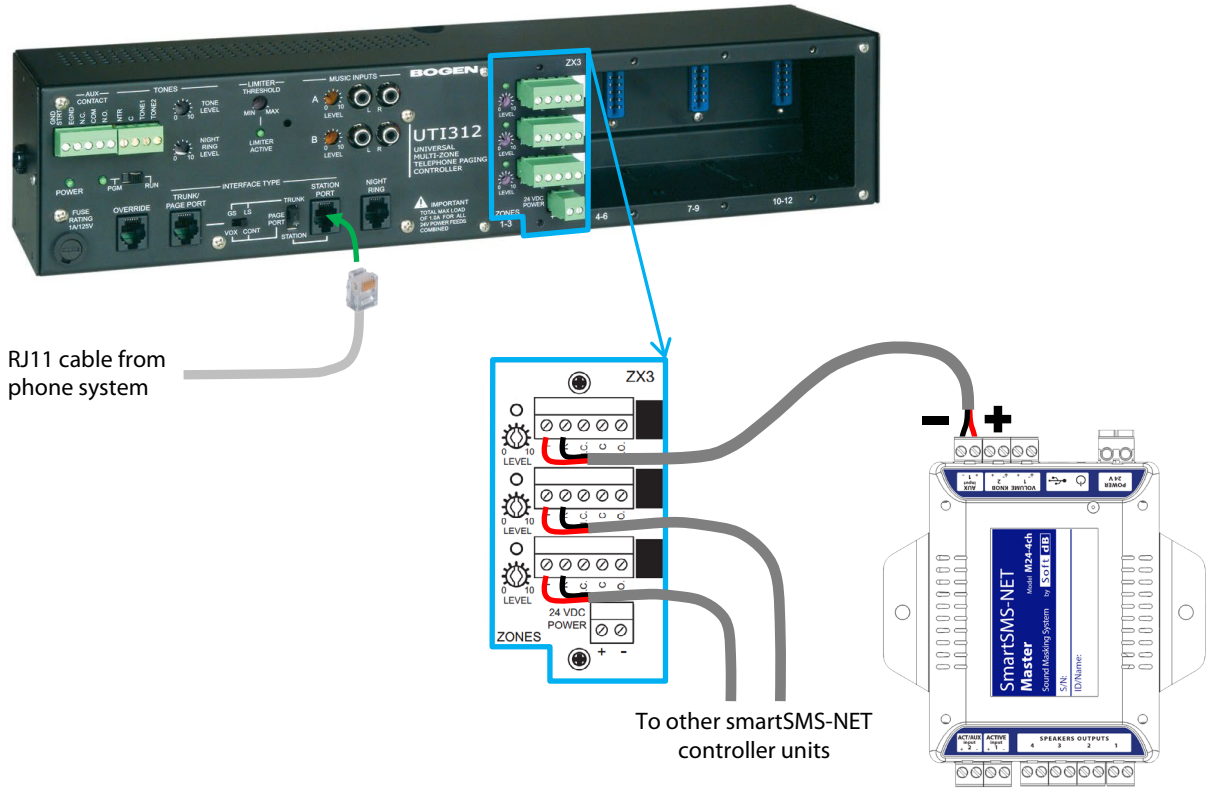
Appendix I Using the Bogen UTI312 as a Paging Source

The SmartSMS sound masking system can be used to place paging call in the office using the sound masking loudspeakers. The most convenient way to do that is to use the phone system.

To do this, we need to add a paging interface to connect to the phone system and convert the phone signal into an analog signal compatible with the smartSMS-NET system. The easiest and most reliable way to do this is to use an analog interface such as the Bogen UTI312.

The Bogen UTI312 Paging System is an expandable multi-zone paging and signaling system. It can be used to send the paging signal to up to 12 smartSMS-NET controllers. To connect to more than 3 controllers, you must order additional ZX3 plug-in modules to go in the module bay.

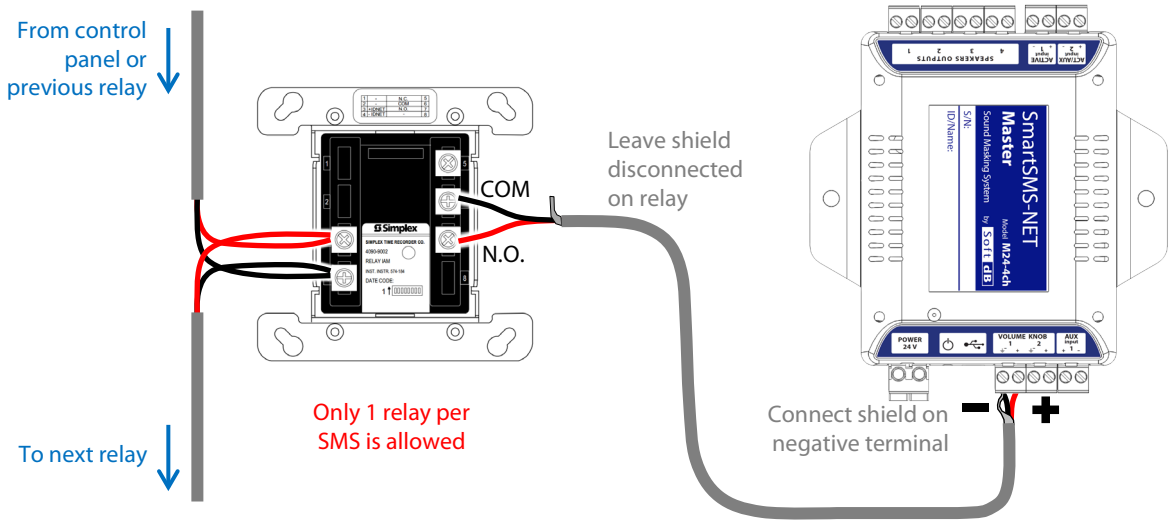
The Bogen UTI312 can connect to almost any analog phone systems: PBX station lines, CO Lines, Page ports or PBX trunk ports. We simply need a phone plug near the Paging interface and connect using a RJ11 cable.



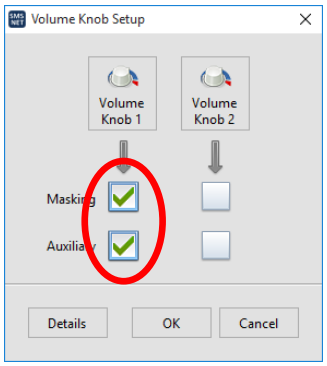
Should the phone system be an IP phone system, the best way to proceed is to continue working with the analog interface but use an Analog Telephone Adapter (ATA) to convert the IP signal to an analog phone signal. The telephone provider should provide the ATA device and set-it up properly with the network settings.

Appendix J Mute Sound Masking and Music during a Fire Alarm

The smartSMS-NET system can be connected to a Fire Alarm Relay to mute sound masking and music during a fire alarm. This is done by wiring the relay to the volume control knob input. During the fire alarm, the relay will close down and create the same situation as when a volume control knob is set to the "Mute" position.



Make sure the volume control knob is activated for the targeted output channels.



Appendix K Generating a Project Report for Crestron Integrator

The smartSMS-NET system is compatible with Crestron advanced control, automation, and unified communications systems[1]. To integrate the smartSMS-NET system to a Crestron system, the smartSMS-NET project structure and layout must be forwarded to the Crestron Integrator.

This information is available as a document which can be created using the Project Manager Software. Use the "Generate Crestron Report" function in the "Project Info" interface to generate the report.

Soft dB CRESTRON

smartSMS-NET sound masking system

Crestron System Management Report

Project Name : Demo_Project

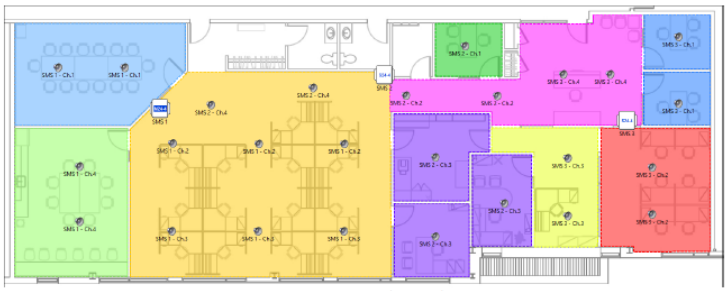


Figure1 Project Layout

Table1 SMS Controllers

Number	Name	Model	DSP Family	Serial Number	WiFi MAC Address	Eth. MAC Address
1	SMS-1	M24-4ch	5535	15091401-22	00 1E C0 18 02 47	N/A
2	SMS-2	S24-4ch	5535	15080400-39	00 1E C0 18 00 05	N/A
3	SMS-3	S24-4ch	5535	15072000-02	00 1E C0 19 E5 56	N/A

Table2 Output Channels

SMS Number	Output Number	Zone Name
1	1	Conference
1	2	Open Plan
1	3	Open Plan
1	4	Conference 2
2	1	Zone
2	2	Reception
2	3	Zone
2	4	Open Plan
3	1	Zone
3	2	Zone
3	3	Zone
3	4	Reception

[1] Crestron 3-SeriesProcessor only

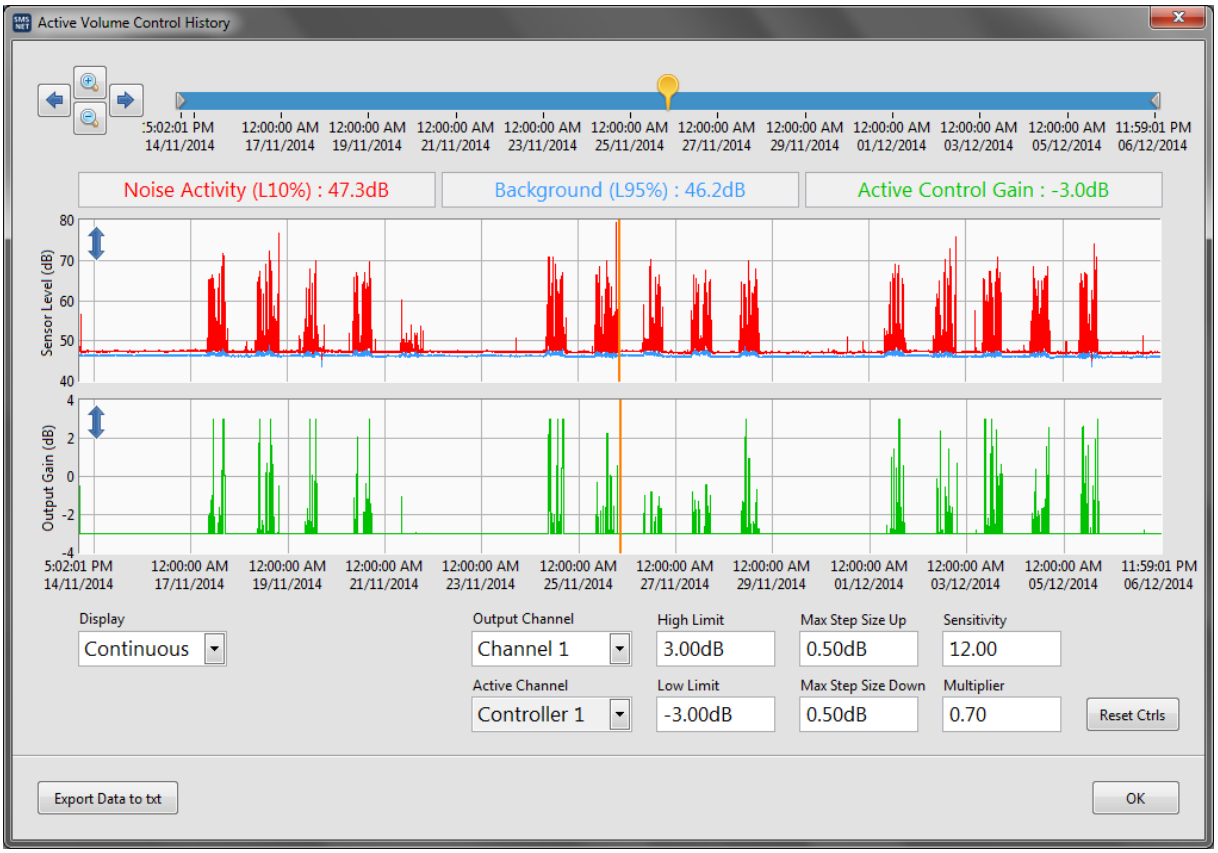
Appendix L Post-Process Active Control History Files

The Project Manager Software includes a utility to post-process active-control history files.

The active control history files can be downloaded manually from the smartSMS-NET unit using the "Load Time History" button from the active control setup interface (see section View Active Control Time History, p. 63), or automatically through system monitoring (see section 9.2 Set-Up Automatic Active Control History, p. 83).

To access the active control time history post-processing utility, click on the 

button from the "Tools" toolbar and browse to the active control history file (*.oba) to load. Note that several files (of different weeks can be loaded at the same time):



The top graph shows the sound level recorded by the sensor: the red line shows the noise activity and the blue line shows the background noise.

The bottom graph shows the resulting active control gain from the processing of the sound levels using the active control parameters (Gain limits, Max step size, Sensitivity and Multiplier). For more

information on the active control parameters refer to section 8.5 Set-Up the Sound Masking Active Volume Control, p. 58.

The above example shows 3 weeks of active control time history. Each day can be clearly identified by the noise activity period ranging from 8 AM to 6 PM.

Weeks and days can be superimposed to show trends: