The ultra-compact mounting amplifier

Smallwonder Amp2X60

Manual 7.1/13En

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Congratulations on your purchase of the Smallwonder Amplifier

Thank you for choosing the ultra-compact mounting audio amplifier **Smallwonder Amp 2X60**. All its components have been carefully selected with the aim to meet the highest demands of sound transmission. The fine price-performance ratio distinguishes this high-quality and potent mounting amplifier from other comparable products.

The **Smallwonder Amp 2X60** is especially designed for installation in furniture, vehicles and similar objects. Thanks to its high-performance digital signal processor, it perfectly adapts to the respective surrounding and setting into which it is to be incorporated. The modifiable transmission functions allow operation of both surface acoustic speakers and regular speakers. The **Smallwonder Amp** turns any smartphone and MP3 player into a powerful audio system.

Please take some time to read these instructions carefully. Only by following the instructions will you be able to hook up this device in the technical proper way so as to put it into operation in order to get to the best sound possible.

Upon request we offer special trainings on how to install the **Smallwonder Amp** amplifier to our industrial and trade partners. If desired, our technicians will support you when fitting your products with the mechanical vibration sound speakers and amplifiers.

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Safety guidelines

The **Smallwonder Amp** amplifier is designed and manufactured according to the latest quality and safety standards. However, we kindly ask you to observe the following instructions on installation and use:

1. Learn about safety
Read the entire operating manual prior to operating the device. Keep the manual in a safe place. Observe all safety guidelines depicted in this manual.

2. Intrusion of objects and liquids
Prevent any kind of intrusion of objects or liquids into the housing of the **Smallwonder Amp** amplifier. If, however, this should occur, immediately unplug the device from the power supply and return the device to an authorized dealer or the manufacturer for inspection.

3. High temperature
Keep the device away from any kind of fire, candles, heating or other appliances producing heat. Never install the device in highly flammable objects.

4. Ventilation
Take care to ensure sufficient space for ventilation around the device. The device is fitted with an over-temperature protection and automatically switches off in case of overheating.

5. Temperature
This product was designed for use at temperatures ranging from -20 ° C to + 70 ° C. Operating outside of these parameters should be avoided and can cause permanent damage.

6. Installation
Install the unit on flat, dry and solid ground. The **Smallwonder Amp** must not be exposed to excessive heat such as sunshine, heaters, fires or the like.

7. Cleaning
Use a dry cloth for cleaning and dusting. Do not use **any kind of** liquid to clean the device.

8. Power Supply
Never connect the device directly to a 230 volt power line. Operation is only permitted using a suitable power supply (primarily 230 volt AC and secondarily 12 volt to 24 volt DC). If in doubt, contact your electrician or your suppliers.

WARNING: Never open the housing of the amplifier. The device does not contain any components that require maintenance. Please leave possible repairs to qualified personnel only.

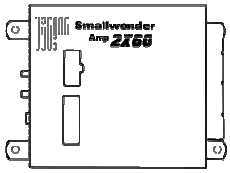
To avoid damage, please note the following:

1. Remove no screws from the device, lids or housing parts.
2. Do not expose the device to rain or moisture.
3. Leave maintenance and repair work to qualified personnel only.

Scope of delivery

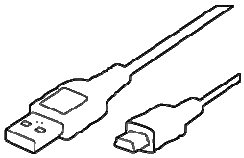
Inspect the content of the package for external damage to the carton packaging and for completeness and intactness of the content.

① **Smallwonder Amp 2X60** amplifier

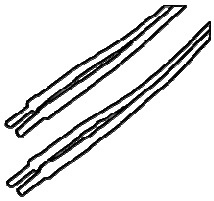


② **CD-ROM** featuring documentation and Configurator software

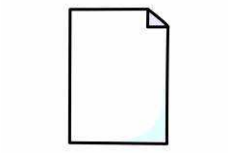
③ **Mini USB cable** for programming the amplifier



④ **12V DC power cable**

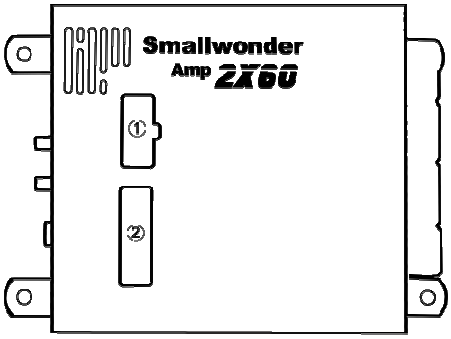


⑤ **Getting started guide**



Control elements and connections

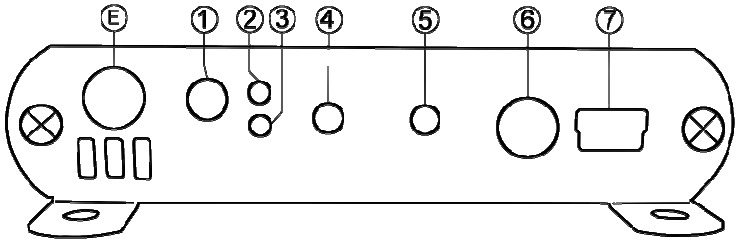
Control elements/connections on the top of the device



① APP interface for optional expansions

② DIP switch for controlling operating functions such as audio pre-setting, sense input, external IR receiver, stereo / mono switch and IR remote control

Control elements/connections on the front of the device



E Installation position for external (optional) Bluetooth antenna

① IR receiver for remote control

② Status LED red

③ Status LED green

④ VOL - decreasing the volume

⑤ VOL + , increasing the volume

⑥ AUX port, external AUDIO IN connector, 3.5mm stereo jack

⑦ USB port, external USB port for programming the amplifier

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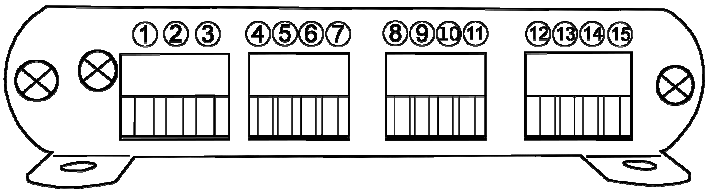
Control elements/connections on the rear of the device



① Operating voltage, ground, GND
② Operating voltage + V, + 12 - 24 volts DC, max. 8 Ampere
③ Sense line H / L for automatic activation
④ High-level audio In left channel ground (L-)
⑤ High-level audio In left channel (L +)
⑥ High-level audio In right channel ground (R-)
⑦ High-level audio In right channel (R +)
⑧ Low-level audio In left channel ground (L-)
⑨ Low-level audio In left channel (L +)
⑩ Low-level audio In right channel ground (R-)
⑪ Low-level audio In right channel (R +)
⑫ Audio Out 4 - 8 ohms (L-)
⑬ Audio Out 4 - 8 ohms (L+)
⑭ Audio Out 4 - 8 ohms (R-)
⑮ Audio Out 4 - 8 ohms (R+)

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Remote control

Key	Function
Pairing	Confirmation key for coupling a Bluetooth device with the **Smallwonder Amp**
Bluetooth	Selector key for Bluetooth Audio In
AUX	Selector key for AUX Audio In
Power	**Smallwonder Amp** on/off
F	Special function key
0 ... 9	Keys for selection of special functions
On	Activate special function
Off	Deactivate special function
DSP	Digital signal processor on/off
PFT	Not programmed; optional expansion
Mute	Mute, audio off
VOL	Volume increase/decrease +/-
Bass	Bass increase/decrease +/-
Treble	Treble increase/decrease +/-
Balance	Balance right / left audio channel

Please keep the remote control in safe place. On request, all functions of the remote control can be deactivated via DIP switches. Depending on the installation situation, this is an option in situations in which the operator does not want to allow the user to change the settings of the **Smallwonder** Amplifier.

Remove the battery protector before first use. The battery protector keeps the battery from discharging should a key be pressed continuously while still being stored within the carton.

Caution! The remote control of the **Smallwonder Amp** uses lithium batteries. The battery must be replaced once all power is used up. Please make sure to use CR2025 batteries only and mind the polarity. **Never throw the old battery into the fire. The battery may explode and release toxic substances.**

Instructions for installation

After you have checked the contents of the package and once you are familiar with the control elements and ports, you can proceed with installation of the **Smallwonder Amp**. First of all, however, make sure to carefully read through this part of the installation guide.

This guide does not give instructions on how to install speakers; when guiding you along the process of installing the **Smallwonder Amp**, we assume that the device is already equipped with properly working speakers.

Caution! Only when all installation work has been completed, must the operating voltage be switched on. Do not remove any cables or connectors during operation.

Step 1: Selection of the installation location
Select a suitable location for the installation of the **Smallwonder Amp** amplifier. The location should be large enough and cool enough, not damp, well ventilated and easily accessible for maintenance and repair.

The installation site must be chosen to ensure that overheating of the **Smallwonder Amp** is prevented. Similarly, at low installation height (e.g. 19 mm), adequate ventilation or cooling is to be ensured. In the event of overheating, the amplifier will turn off as a matter of precaution (see chapter on protection mechanisms).

Likewise, the location should be chosen in a way that the maximum cable length does not, if possible, exceed 3 m. Cables longer than 3 m may cause loss of power. For longer distances, cables with a larger diameter must be used.

Step 2: Mounting the amplifier
Fix the amplifier with at least 4 screws at the mounting location. If desired, make sure that the amplifier is within reach of the IR remote control.

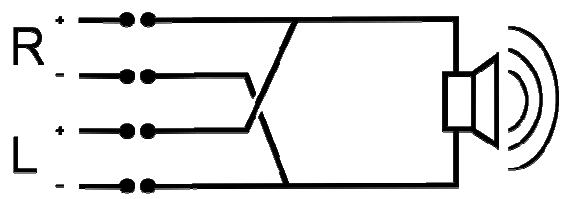
Step 3: Installation and connection of power supply (alternatively battery operation)
Install the power supply required for operation and observe the safety regulations that ought to be applied. Connection of permanently energized electrical cables and lines of 230 volts is to be carried out by trained and authorized personnel only. An alternative for use in vehicles may be a 12 or 24 volt battery.

Connect the amplifier to the terminals of the power supply/battery. Pay attention to the cables correct polarity. Use the power cord included in the delivery. Do **not** turn on the power supply yet and do **not** connect the amplifier to the battery.

Step 4: Connecting the speakers
The next step is to connect the preferred speakers or surface acoustic speakers.

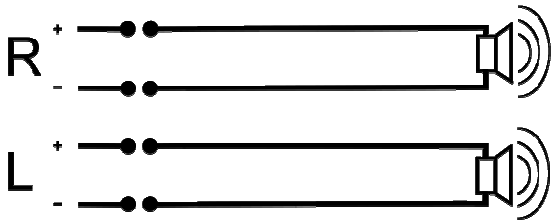
You can choose between a stereo jack (standard with conventional speakers) and a mono jack (usually the better alternative when using surface acoustic speakers).

Mono operation



Mono operation is a proper mode if only one speaker or surface acoustic speaker is to be operated. The two "+" channels and the two "-" channels are bridged according to the circuit diagram as illustrated above. In addition, the DIP 9 switch must be set to "off". In mono operation, the speaker's maximum power is 120W. The speaker selected has to have an impedance of 4 - 8 Ω.

Stereo operation



The stereo mode is applied when two speakers are to be connected. The connection corresponds to the above diagram. In addition, the DIP 9 switch must be set to "On". In stereo mode, the speakers can be used with a maximum output of 2 x 60W. The selected speakers have an impedance of 4 - 8 Ω.

Step 5: Connecting the sense line (only if necessary)
Connect the sense line (for example, ignition in the car). Depending on the configuration, the Configurator software or DIP switch, the **Smallwonder Amp** can automatically be switched on and off.

Step 6: Connecting an external IR receiver (only if necessary)
If the installation location is hidden and you want to work with the IR remote control, connect the external IR receiver (article SWA items IRE). Afterwards, install it at the desired location.

Step 7: Connecting an external Bluetooth pairing key (only if necessary)
If you want to work with the external Bluetooth pairing key (article SWA-BPT), it is now possible to connect and install it at the desired location.

Step 8: Finishing works
Check all connections once again. Cables should be secured with suitable material. In particular, when using surface acoustic speakers, it is important that no cables or other parts come into to contact with the vibrating surface without previously having been fixed.

Step 9: Switching on
Connect the power supply to the 230 volt mains or connect the battery. The amplifier automatically turns on and is now in standby mode. Activate the **Smallwonder Amp** amplifier by using the remote control. For a first test, connect to a signal source via cable or Bluetooth. Adjust the volume to your liking by remote control or via the key situated on the front panel of the amplifier.

You can now make all the desired settings by using the remote control or via Configurator software.

The installation work has been completed. We hope you enjoy using the **Smallwonder** amplifier.

Functional descriptions

The following section describes the different functions of the **Smallwonder Amp**. You will only occasionally need very a few of these functions. Nevertheless, please read the functional descriptions carefully. This way, you can make sure that you are familiar with all possible functions of your amplifier.

Power on/off

The **Smallwonder Amp** switches on automatically when powered from the AC adapter or battery. After only a few seconds it is detected by devices featuring Bluetooth and can play music via the internal inputs. In order to switch it off, all you need to do is to cut the supply voltage by, for example, using a switchable outlet socket.

Standby mode

In standby mode, the **Smallwonder Amp** has extremely low power consumption. This mode can be set up in three different ways:

1. The **Smallwonder Amp** is set to standby via remote control.
2. The **Smallwonder Amp** automatically switches to standby mode as soon as the audio signal is not detected any longer (via Bluetooth or AUX inputs). Once it detects a signal again, the **Smallwonder Amp** automatically "awakes" from standby mode.
3. If the sense input is connected, the **Smallwonder Amp** "awakes" from stand mode as soon as this input is supplied with voltage. If there is no voltage, the amplifier is set back to standby mode. This mode, for example, can be used when the amplifier is to be installed in a car (ignition on → amplifier on).

The standby mode is indicated by the red LED at the of the **Smallwonder Amps** front panel. The display can also be turned off completely by using the key combination **[F] + [7] + [2] + [Off]**. The LED is turned back to standby mode by entering the combination **[F] + [7] + [2] + [On]**.

Bluetooth pairing

Bluetooth devices such as smartphones, tablets and MP3 player can be connected to the **Smallwonder Amp** in four different ways. Please note that it is possible to hook up **only one** device at a time to the **Smallwonder Amp**.

Simple pairing

This method is preferably used in the private sector. The connection with the **Smallwonder Amp** directly is set directly via the Bluetooth device. The procedure may slightly vary depending on the manufacturer and the model employed.

Please follow the following instructions (which generally apply to most of the devices):

1. Switch on the **Smallwonder Amp**.
2. Switch on the device's (e.g. Smartphone) Bluetooth function (usually to be found under the device's setting).
3. Scan for other available Bluetooth devices.
4. The **Smallwonder Amp** will be listed with the ID „**Smallwonder**". Tick the ID in order to connect. Some manufacturers require another second tick to establish a connection. The ID "**Smallwonder**" can be changed according to the user's wishes via the Configurator software.
5. You have now successfully established a connection to the **Smallwonder Amp**. Now, please open a music file that is saved on the device. Playback is carried out automatically via the **Smallwonder Amp**.

Pairing via confirmation by using a push button

This type of Bluetooth pairing is perfect for locations that are highly frequented or which for other reasons should authorize only certain individuals or a group to get access to the **Smallwonder Amp** (e.g. hotel rooms or ship cabins).

To ensure this, a push button is installed at a location that cannot be publicly accessed. Only authorized personnel are able to access the push button in order to establish pairing with the **Smallwonder Amp** within a period of 180 seconds (3 minutes). Pairing is only possible within the next 3 minutes after having pressed the key!

Pairing with confirmation via IR remote control

With this type of pairing, a connection to the **Smallwonder Amp** is only possible after having pressed the remote control's Bluetooth key for the duration of 180 seconds (3 minutes).

Pairing via PIN code

This method can only be carried via using older cell phone models. The **Smallwonder Amp** receives a four-digit, numeric login PIN code via the Configurator software. If a user tries to establish a connection with the amplifier, he will first be asked to enter the four-digit login PIN code. If the code is incorrect, the connection will automatically be cut off. It is, however, possible to start a new pairing afterwards.

Note: The option "Pairing with code entry" cannot be set via the Configurator software. This pairing procedure is always selected automatically if an older mobile phone does not support modern pairing procedures.

The following Bluetooth protocols are supported:

A2DP
The **Smallwonder Amp** supports audio streaming according to the A2DP standard (Advanced Audio Distribution Profile).

AVRCP
The **Smallwonder Amp** receives control information according to the standard AVRCP (Audio Video Remote Control Profile).

DIP switches

In addition to audio pre-settings (transmission functions of the amplifier), it is also possible to set other modes of operation. The DIP switches are located on the top of the amplifier housing and are labeled accordingly.

The following settings can be made via the DIP switches:

DIP switch	On	Off
1	Control via DIP switch	Control via software
2	Audio pre-setting 1 on	Audio pre-setting 1 off
3	Audio pre-setting 2 on	Audio pre-setting 2 off
4	Audio pre-setting 3 on	Audio pre-setting 3 off
5	Free for extensions	Free for extensions
6	Free for extensions	Free for extensions
7	Sense mode high: active	Sense mode low: active
8	External IR receiver: on	External IR receiver: off
9	Stereo operation	Mono operation
10	IR remote control allowed	IR remote control locked

Selection of desired control (DIP switch 1)
This DIP switch controls the default setting of the **Smallwonder Amp**. If DIP switch 1 is set to "OFF", all of the other DIP switch settings are disabled. The basic setting of the amplifier is then exclusively carried out via the Configurator software**.**

Audio pre-settings (DIP switch 2 to 4)
In addition to various standard audio pre-settings, an individual audio pre-setting can be programmed via the Configurator software. Using the DIP switch 2 to 4 it is possible to select different audio pre-settings.

DIP switch 2	DIP switch 3	DIP switch 4	Transmission function
OFF	OFF	OFF	Equalizer off
OFF	OFF	**ON**	For audio output with surface acoustic speakers on **wood**
OFF	**ON**	OFF	For audio output with surface acoustic speakers on **glass**
OFF	**ON**	**ON**	For audio output with surface acoustic speakers on **metal**
ON	OFF	OFF	For audio output with surface acoustic speakers on **lightweight constructions and lightweight walls**
ON	OFF	**ON**	Free for extensions
ON	**ON**	OFF	Free for extensions
ON	**ON**	**ON**	Individual audio output by using Configurator software

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Sense mode (DIP switch 7)
Via the sense mode it is possible to activate or switch off the **Smallwonder Amp** via an external signal (5-24 volt). Thus, for example, when installed in a vehicle, the **Smallwonder Amp** is switched on as soon as the ignition lock is activated. Installation should be performed by trained personnel only.

Important: If the sense line is not connected, the DIP switch 7 must be set to "OFF", since the unconnected input is set to low active.

External IR Receiver (DIP switch 8)
The **Smallwonder Amp** can be expanded with an external IR receiver if the installation is located at places that are difficult to access. The IR receiver can be installed at any location, thus ensuring that the remote control can still be used to operate the **Smallwonder Amp**. The external IR receiver can be turned on and off via DIP switch 8.

Stereo / Mono (DIP switch 9)
Depending on the configuration of the speakers, this function allows for switching between mono and stereo operation

IR remote control (Dip switch 10)
To avoid unwanted access by unauthorized persons, access to the **Smallwonder Amp** via IR remote control can be completely turned off. In this case, the **Smallwonder Amp** can only be controlled via the functions featured by the Bluetooth device.

The DIP switches 5 and 6 are free for possible future expansions.

IR remote control

The IR remote control can be used to modify the various settings of the **Smallwonder Amp**. For best performance, make sure to guarantee continuous "visual contact" between the IR remote control and **Smallwonder Amp**.

Important: If the DIP switch 10 is set to "OFF" and / or if the IR remote control is deactivated through the Configurator software, operation via IR remote control is not possible.

An overview of the key assignment of the IR remote control has already been given in the previous chapter "Control elements and connections". The functions and effects of the individual settings will be explained in detail in the following section.

Pairing

If a Bluetooth pairing is set by remote control, this key can make the **Smallwonder Amp** visible or it can be detected by other Bluetooth devices for the duration of 180 seconds (3 minutes). Within this time frame, the amplifier can be connected with the Bluetooth device

Bluetooth

The Bluetooth key allows for compulsory recognition of Bluetooth audio streaming. This also applies if, for example, an audio signal is detected by the AUX input. A smartphone, for example, will have a higher priority than a connected AUX device.

Power

The power key sets the **Smallwonder Amp** in standby mode. When pressing it a second time, it will wake / reactivate the **Smallwonder Amp**.

AUX The AUX key allows enforced detection of the AUX stream, even if an audio signal is detected by the Bluetooth input. This way, for example, a connected auxiliary device has a higher priority than a smartphone.

DSP The DSP key allows digital signal processor to be completely be switched off or on. After shutdown all the preset filters (e.g. audio pre-setting, bass, treble, balance, etc.) are inactive.

PFT Free for extensions

Mute Turns the **Smallwonder Amp** to mute. To hear the unit again, press the mute key once more or press VOL + / -

By VOL
+ Gradual increase of volume of the **Smallwonder Amp**.
- Gradual decrease of volume **Smallwonder Amp**.

Bass
+ Gradual increase of bass of the **Smallwonder Amp**.
- Gradual decrease of bass of the **Smallwonder Amp**.

Treble
+ Gradual increase of treble of the **Smallwonder Amp**.
- Gradual decrease of treble of the **Smallwonder Amp**.

Balance
R Gradually changes the balance from the left to the right channel.
L Gradually changes the balance from the right to the left channel.

Key signals

On [F] + [7] + [0] + [On]
Turns on the key signal. If the **Smallwonder Amp** detects a valid function call from the IR remote control, an acoustic signal is emitted. Exceptions are keys to control the volume, bass and treble adjustment and balance.

Off [F] + [7] + [0] + [Off]
Turns off the key signals.

Automatic activation

On [F] + [7] + [1] + [On]
If the amplifier is in standby mode and an audio stream is detected, the device will automatically be activated and emit the audio stream. **This setting is activated by default.**

Off [F] + [7] + [1] + [Off]
The **Smallwonder Amp** does not automatically start the playback of the audio stream upon detection. The unit must first be switched on via IR remote control.

Standby LED

On [F] + [7] + [2] + [On]
The red status LED emits a signal if **Smallwonder Amp** is set to standby mode.

Off [F] + [7] + [2] + [Off]
When operating in standby mode, no LED is active. Thus, the standby mode cannot be visually distinguished from the mode once the device is completely switched off. This is vital in order to not further impair persons with increased sensitivity to electromagnetic waves.

Pseudo Stereo

On [F] + [8] + [1] + [On]
Enables the pseudo stereo mode. In this mode, an incoming mono signal is processed to an artificial stereo signal and emitted as an artificial stereo signal.

Off [F] + [8] + [1] + [Off]
Deactivates the pseudo stereo mode. An incoming mono signal is treated as such and emitted through one channel only.

Pseudo Mono

On [F] + [8] + [2] + [On]
Activates the pseudo mono mode. In this mode, an incoming stereo signal is processed to an artificial mono signal and emitted as an artificial mono signal.

Off [F] + [8] + [2] + [Off]
Deactivates the pseudo mono mode. An incoming stereo signal is treated as such and emitted through both channels.

Restore Default Settings

[F] + [1] + [0] + [0] + [On]
With this key combination the default system settings of the **Smallwonder Amp** are restored. All individual settings made via remote control are lost. Setting of the Configurator software will be retained.

Priority Bluetooth

[F] + [1] + [2] + [0] + [On]
This setting **permanently** ensures that the Bluetooth input always has priority over the input via cable (AUX input)

Priority AUX

[F] + [1] + [2] + [1] + [On]
This setting **permanently** ensures that the input via cable (AUX input) always has priority over the Bluetooth input. This feature is important, if announcement and emergency call systems are connected by cable input. In case of emergency calls, the Bluetooth output will automatically be interrupted.

Save Volume

[F] + [2] + [0] + [0] + [On]
The current volume will be saved. The saved volume will be set on each start of **Smallwonder Amp.**

Control - Protection against overload

[F] + [5] + [0] + [1] + [On]
If activated, this function displays the number of occurred overload errors by means of an audio signal (beep). Each acoustic signal corresponds to maximum 10 errors.
.

Control - Protection against under-voltage

[F] + [5] + [0] + [2] + [On]
If activated, this function displays the number of occurred under-voltage errors by means of an audio signal (beep). Each acoustic signal corresponds to maximum 10 errors.

Control - Protection against over-voltage

[F] + [5] + [0] + [3] + [On]
If activated, this function displays the number of occurred over-voltage errors by means of an audio signal (beep). Each acoustic signal corresponds to maximum 10 errors.

Control - Protection against clipping	**[F] + [5] + [0] + [4] + [On]** If activated, this function displays the number of occurred clipping errors by means of an audio signal (beep). Each acoustic signal corresponds to maximum 10 errors.
Control - Protection against overheating	**[F] + [5] + [0] + [5] + [On]** If activated, this function displays the number of occurred overheating errors by means of an audio signal (beep). Each acoustic signal corresponds to maximum 10 errors.

Protective mechanisms

The **Smallwonder Amp** has several built-in protective mechanisms. They protect both the **Smallwonder Amp** and the connected speakers from damage.

The following protective mechanisms are integrated:

Reverse polarity protection
If the polarity of the supply voltage is accidentally reversed, the reverse polarity protection protects the **Smallwonder Amp** from damage. Polarity protection is also triggered when connecting to an AC instead of DC power source.

Caution! Voltages above 35 volts can cause permanent damage to the amplifier.

High-voltage Protection
The power consumption of the amplifier is continuously monitored. If it is too high, the device is switched off as a precaution. Try to fix the error (e.g. excessive volume). The **Smallwonder Amp** is automatically turned on again after a few seconds.

Caution! Voltages above 35 volts can cause permanent damage to the amplifier.

Low-voltage Protection
The power consumption of the amplifier is continuously monitored. If it is too low, the device is switched off as a precaution. Try to fix the error (e.g. incorrectly set power supply, low battery). The **Smallwonder Amp** is automatically turned on again after a few seconds.

Protection against distortion (clipping protection)
The audio output of the amplifier is continuously monitored. In case of excessive distortions, the device is switched off as a precaution. Try to fix the error (e.g. overdriven input signal). The **Smallwonder Amp** is automatically turned on again after a few seconds.

Protection against overheating
The operating temperature of the amplifier is continuously monitored. In case of excessive temperatures, the device is switched off as a precaution. Try to cool down the device. The **Smallwonder Amp** is automatically turned on again after a few seconds.

LED status

The two LEDs on the **Smallwonder Amp's** front panel pass on information on the device's current operating status and any possible errors by a combination of different signals.

The following table describes the various states of operation:

Device active	🟢	green LED:	illuminating
	🔴	red LED:	not illuminating
Standby	🟢	green LED:	not illuminating
	🔴	red LED:	illuminating
Protection mechanism ON	🟢	green LED:	not illuminating
	🔴	red LED:	flashing (0,5s on, 1s off)
USB connection detected	🟢	green LED:	flashing (0,5s on, 0,5s off; time interval: 4s)
	🔴	red LED:	not illuminating
Command from IR remote control	🟢	green LED:	not illuminating for 0,3s
	🔴	red LED:	not illuminating
External pairing key is pressed	🟢	green LED:	flashing rapidly (0,2s on, 0,2s off)
	🔴	red LED:	flashing rapidly (0,2s on, 0,2s off) time interval: until pairing is successful or until 180s are over
Bootloader active (firmware update)	🟢	green LED:	flashing alternately
	🔴	red LED:	flashing alternately

Automatic self-test

If required, the **Smallwonder Amp** can perform an automatic self-test. To start the self-test, follow along these steps:

1) Disconnected the **Smallwonder Amp** from the mains so that it no longer carries any voltage (turn off power supply or unplug from power supply).
2) Simultaneously press and hold **VOL+** und **VOL-** key.
3) Switch on operating voltage (turn on power supply or plug in power supply).

The **Smallwonder Amp** now emits a 1000 Hz test tone in the following order:

1) 10 sec 1000 Hz test tone on left and right channels
2) 10 sec 1000 Hz test tone on left channel
3) 10 sec 1000 Hz test tone on right channel

Afterwards the amplifier will return to normal operation. With the automatic self-test you can easily check the proper functioning of the amplifier and the speakers. Mind that minimal deviations with regard to of the test tone's interval and frequency are absolutely normal and do not indicate any malfunction of the device.

Smallwonder Amp software

The software (CD-ROM) for the **Smallwonder Amp** is included in the delivery and features the following programs:

Installation software for Configurator software

Use this software to install the Configurator software. **The software requires the .NET Framework by Microsoft which can be downloaded for free at *www.microsoft.de.*** The Configurator software works with all current Windows personal computers.

Configurator software for programming

The Configurator software allows for easy and comfortable programming of all settings. Transmission curves – also known as audio pre-settings – can be adjusted quickly. All settings can easily be exported and transferred to a new system.

Note: The Configurator software offers its demanding listener to adapt the **Smallwonder Amp** to achieve optimal sound quality.

Especially when surface acoustic speakers are to be used the transmission function can easily be adapted to material that is to be applied.

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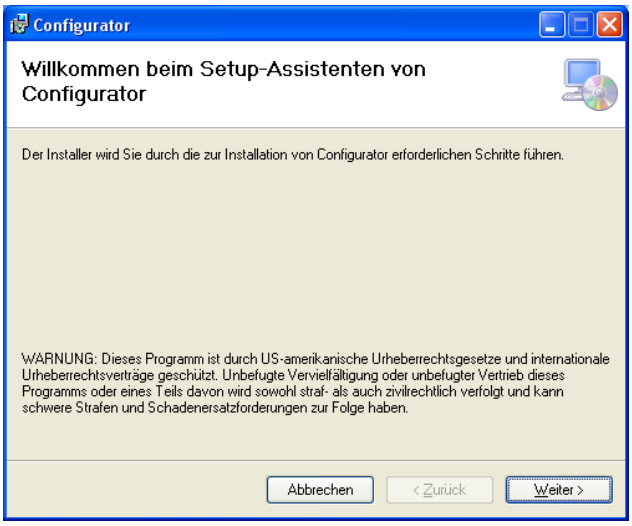
Installation software for Configurator software

The installation software installs the Smallwonder Configurator software on your personal computer. The program serves as a simple tool to comfortably configure your **Smallwonder Amp's** settings. The Configurator software runs on the currently latest Microsoft Windows version. Please check the download section under www.smallwonder.de for current program versions.

The software is usually needed only once to set up the **Smallwonder Amp**. In larger productions, it can be used for quick programming of large quantities. The software enables you to optimize sound quality according to one's own individual sense of hearing.

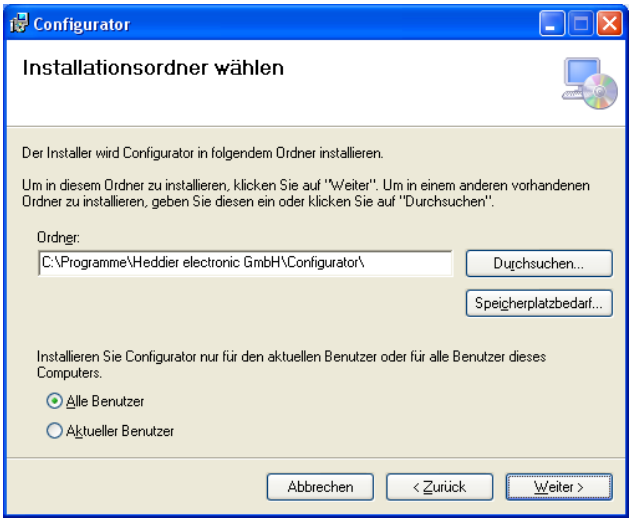


Step 1:
Open the "ConfiguratorSetup.msi" installation file on the CD-ROM. Confirm the installation in the following window by clicking "Weiter".

Screenshot translation:

The installer will guide you through the next steps of installing the Configurator.

***WARNING:** This program is protected by US-American copyright law and international copyright agreements. Any unauthorized commercial reproduction or distribution of this program or a part there of is expressly prohibited by criminal and civil law, and may result in severe civil and criminal penalties and claims for damages.*



Step 2:
Select an installation folder and specify for which user the Configurator software should to be installed.

Screenshot translation:

The installer will install the Configurator in the following file:

To install to this folder, click "Weiter". If you wish to install the Configurator in another existing file, enter it manually or click Browse.

Install the Configurator only for the current user or for all users of this computer.

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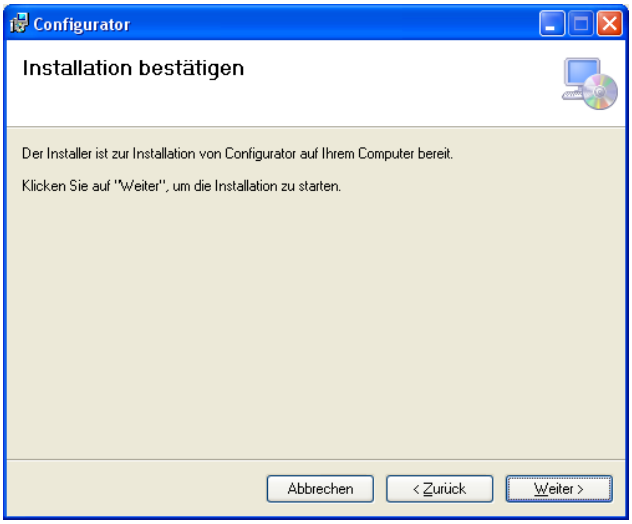


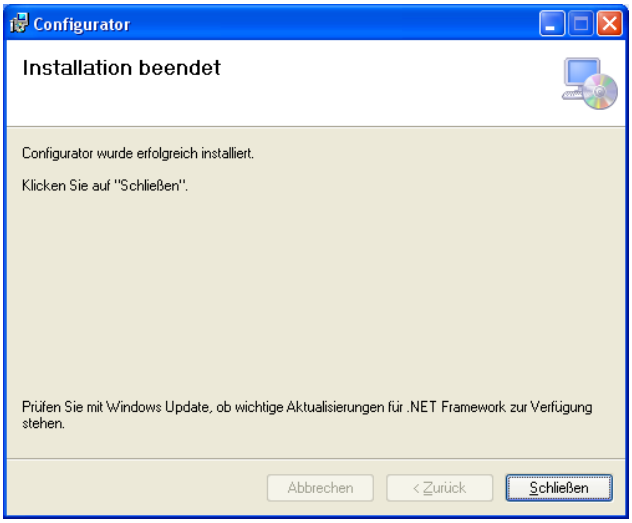
Step 3:

Confirm your data submitted by clicking “Weiter”.

Screenshot translation:

The installer is ready for installation of Configurator on your personal computer.

Click “Weiter” to start installation.



Step 4:

Complete the installation by clicking on “Schließen”. You can now use the program. The installation process is now complete.

Screenshot translation:

Configurator has been successfully installed. Click on “Schließen”.

Check with Windows Update to make sure if important updates for .NET Framework are available.

Configurator software for programming

The following section describes the settings that are featured in the **Smallwonder Amp** Configurator software.

Configuration

The configuration menu allows the user to change the settings of parameters. Most settings can be made both via the Configurator software and by using the remote control or the DIP switches.

Note: Please note that the DIP switch 1 must be set to "Off" so that the Configurator settings take effect.

General Settings

Sense Input high active
If you select this setting, the **Smallwonder Amp** can be started via an externally applied voltage and switched to standby mode. The feature is useful for installation in vehicles (ignition voltage terminal 15). See the chapter Functional description / DIP switches for more information.

ON LED active
When set to “on”, the **Smallwonder Amp** indicates its operating mode by the green status LED. If the hook is not set, it is not possible to visually identify the operating mode, i.e. the device is active or ready to be activated.

Standby LED active
When set to “off”, the **Smallwonder Amp** indicates its standby mode by the red status LED. If the hook is not set, it is not possible to visually identify the standby mode, i.e. the device is not active or not ready to be activated. This feature is helpful when installing the amplifier in the bedroom area. All essential features of the device are turned off.

Auto power ON
The **Smallwonder Amp** automatically turns on when receiving an incoming audio signal (via Bluetooth or AUX input).

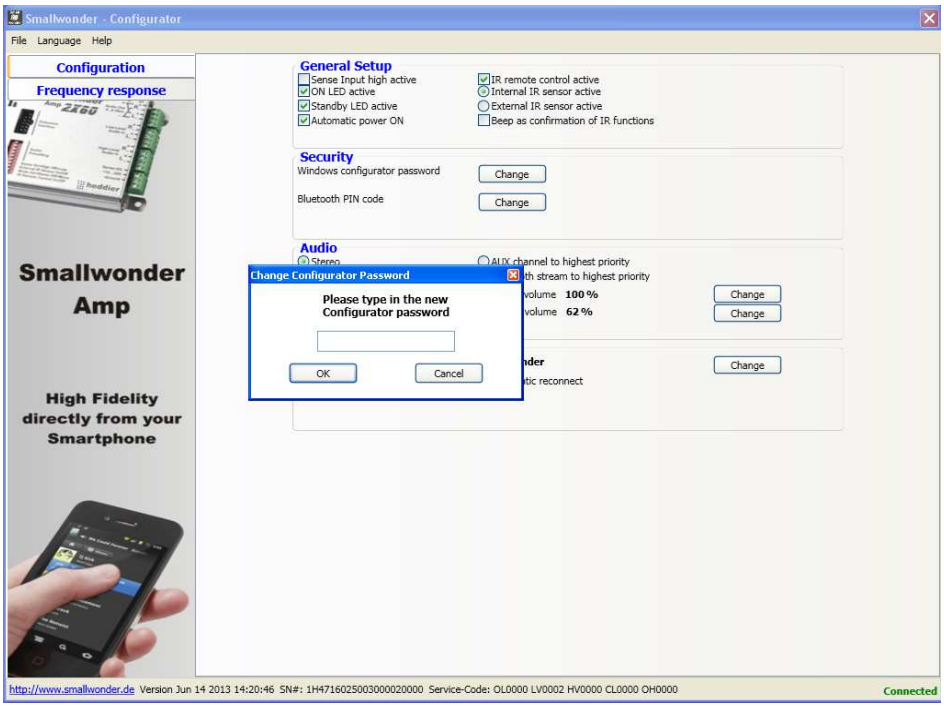
IR remote control active
The **Smallwonder Amp** can be operated by remote control (internal or external IR receiver). Once the check is removed, it is no longer possible to operate the **Smallwonder Amp** via remote control.

Internal IR sensor active / External IR sensor active
Depending on the setting, either the internal IR receiver (when set to default) or the IR receiver (that can be connected externally) is activated for interpreting the remote control signals. For more information about external IR receivers, see the chapter Functional descriptions / DIP switches.

Beep as confirmation of IR functions
If this function is activated, an audible signal is emitted as soon as a valid function call on the remote control (see chapter Function Descriptions / IR Remote Control) is selected. This does not apply to keys that control volume, bass and treble adjustment and balance.

Security

Configurator password

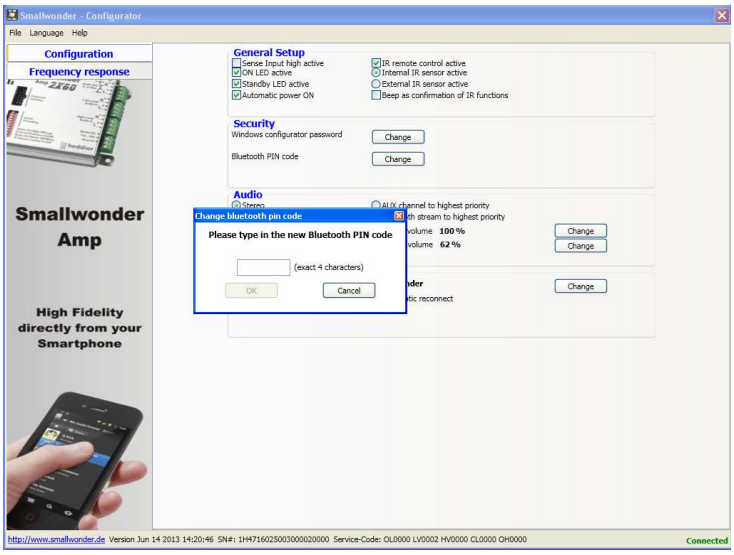


The standard password is 0000 .

By clicking on the "Change" button, it is possible to create a new password. This password has to be entered when starting the Configurator software along (mind that the current **Smallwonder Amp** is also connected to the system). **Please bear in mind that without the correct password changes the settings are no longer possible.**

Note: If you forget the password, you can request a master password in writing to the manufacturer.

Bluetooth PIN code



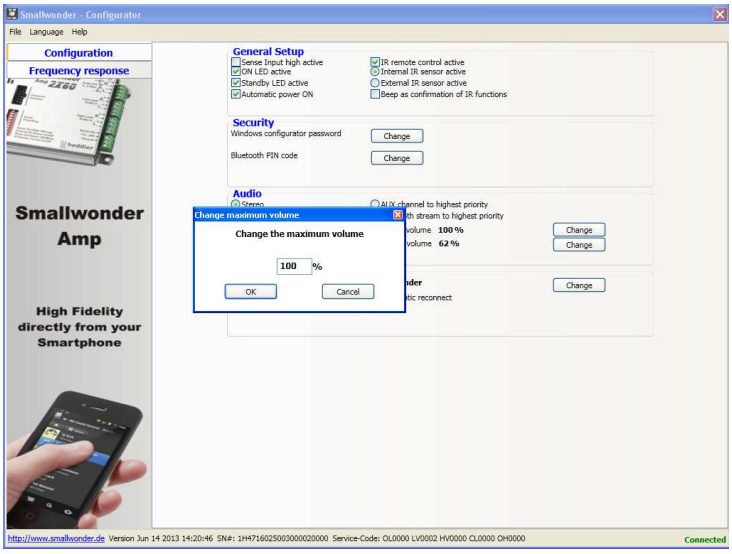
By clicking on the "Change" key, the Bluetooth PIN code can be entered. In order to access the **Smallwonder Amp** by means of another device via Bluetooth function, the user is asked to first enter the password.

Audio

Stereo / Mono
Selection between mono and stereo mode. For more information on connecting speakers, see the chapter Installation guide.

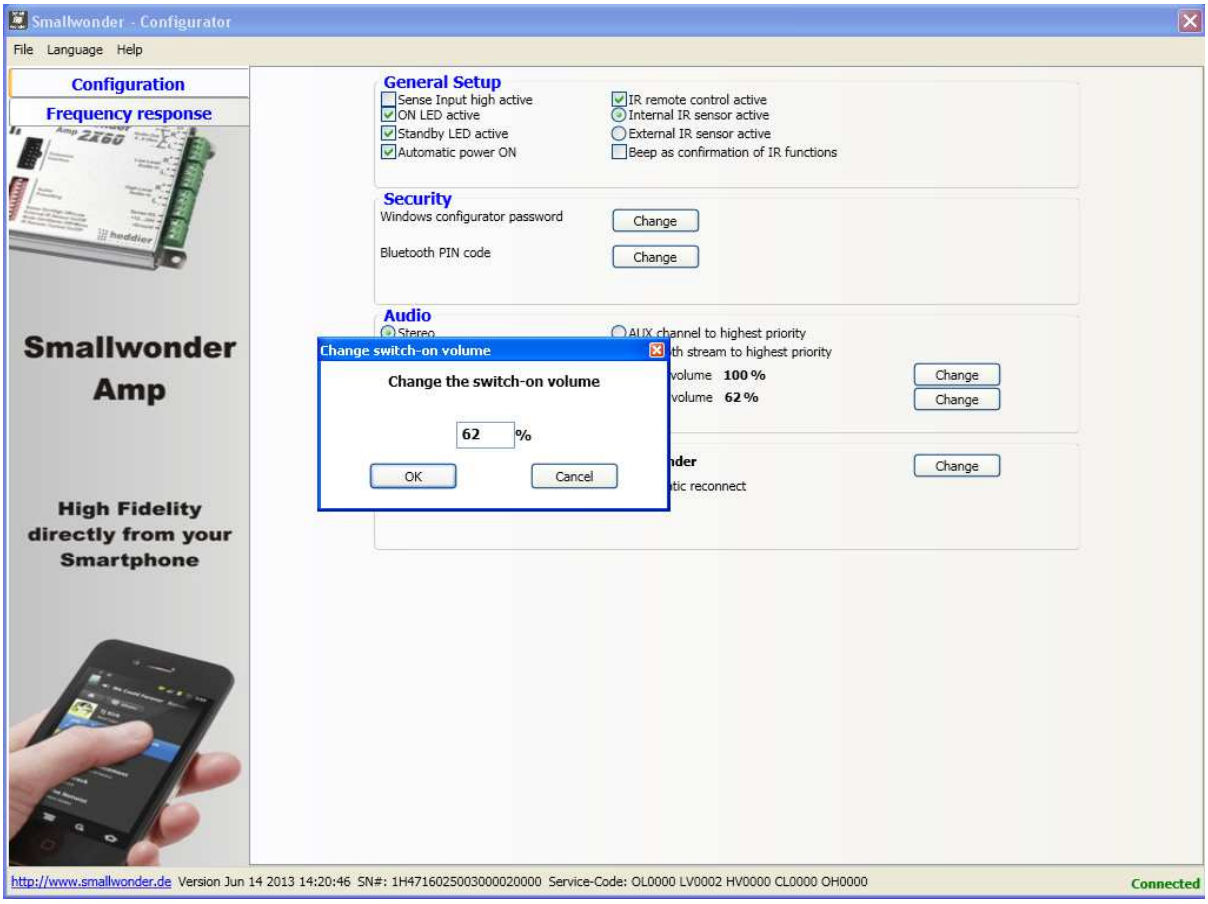
Pseudo Stereo / Pseudo Mono
Selection between pseudo stereo and pseudo mono mode. For more information see chapter Functional descriptions / IR remote control.

Maximum volume



The maximum volume can be determined by clicking the "Change" key. 100% corresponds to the maximum volume. **Too much volume may cause damage to the speakers.** The output power might vary depending on the operating voltage.

Switch-on volume



By clicking on the "Change" key, the Switch-on volume is set. **The maximum Switch-on volume can maximally have the value of the maximum volume.** Otherwise, an error message is issued. Too high a setting may cause damage to speakers. The output power may vary depending on the operating voltage.

AUX channel to highest priority / Bluetooth stream to highest priority
The preferred audio source depends on the setting. For example, if the function "Bluetooth stream to highest priority" is activated and if an audio signal is to be emitted via a 3.5 mm jack plug input, then a Bluetooth signal that is simultaneously detected, will be emitted by the **Smallwonder Amp**.

Bluetooth

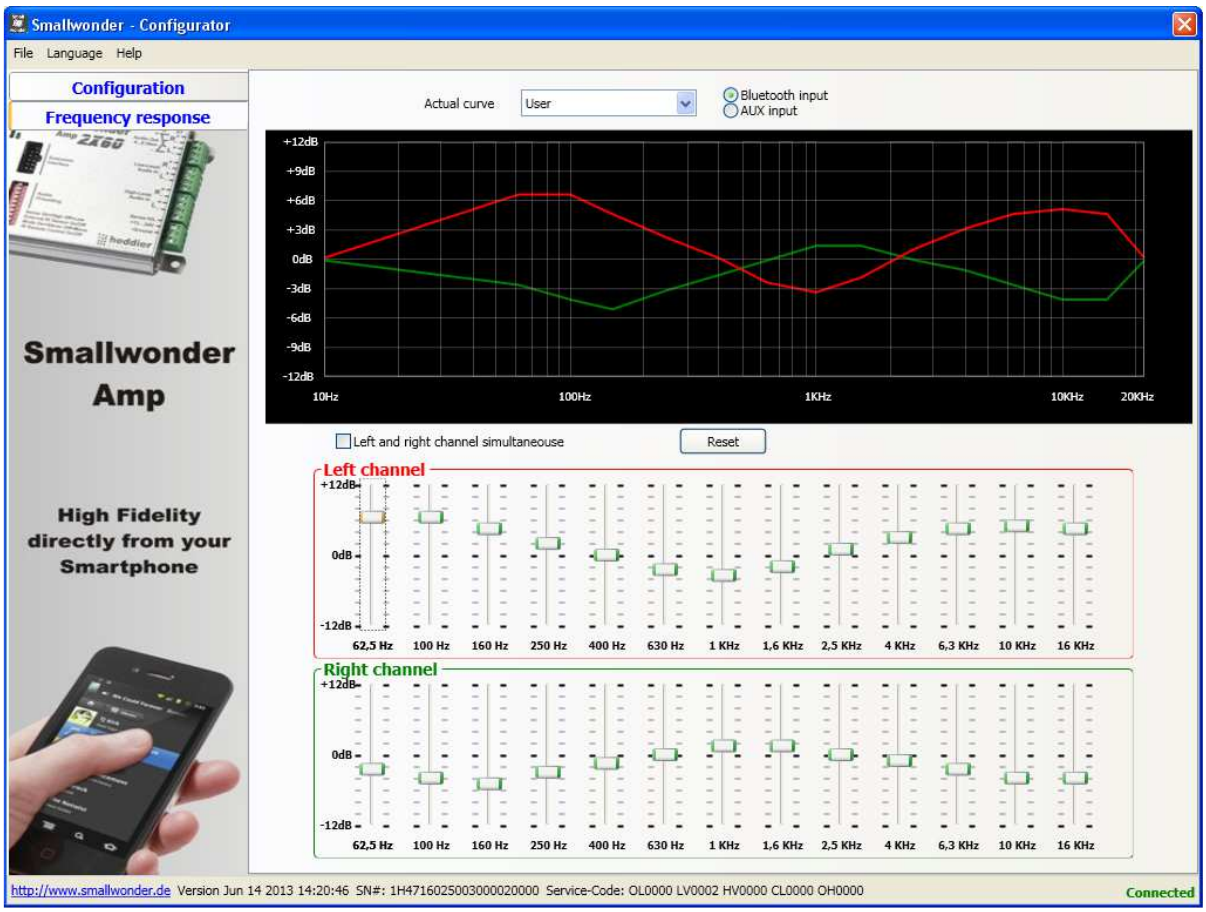
Smallwonder´s Bluetooth name is
By clicking the "Change" key you can define a new name for the **Smallwonder Amp**. This name is now the new name of the respective Bluetooth device that is paired with the **Smallwonder Amp**.

Free pairing / Pair with external button / Pairing via PIN
Depending on the setting one of the stated active pairing modes is activated. Please see chapter Function / Bluetooth Pairing for further information about the "Bluetooth pairing".

Automatic reconnect
If this function is set, a Bluetooth device (e.g. a smartphone) is directly connected to the **Smallwonder Amp**, provided that it is within range and a manual connection between the devices has already been made once before. Thus, a manual connection via the Bluetooth setting of your smartphone is not necessary.

Frequency response

Current transmission curve

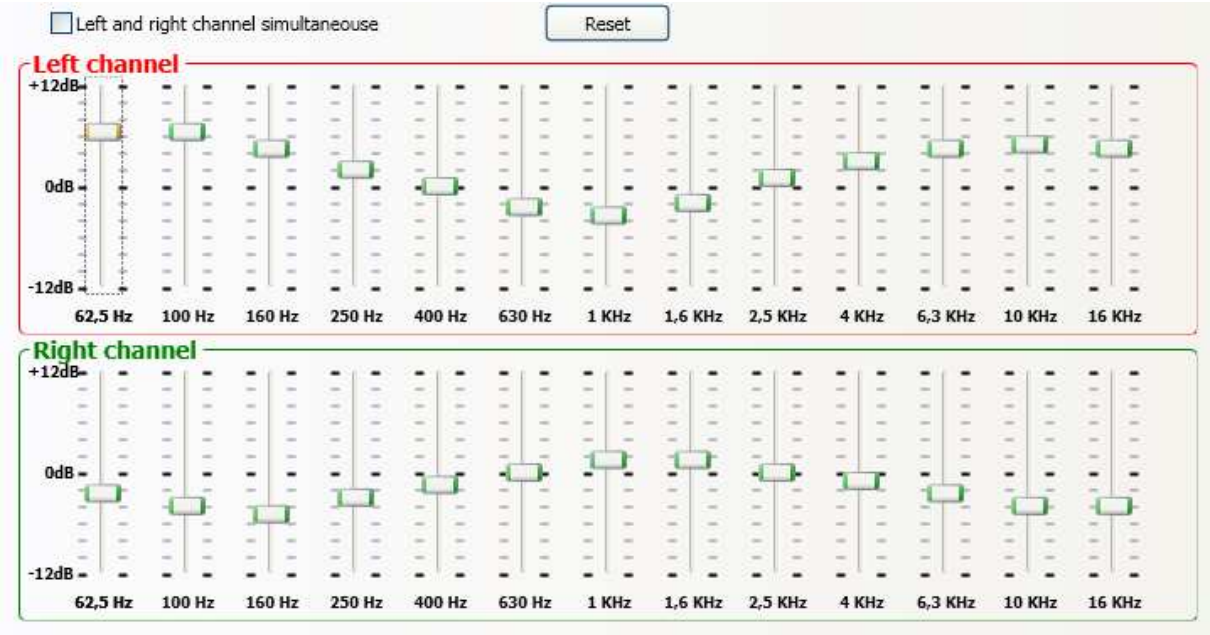


The transmission function preferred for editing/using can be selected from a pull down menu. There are a total of five transmission functions to choose from. Four of them are predefined and cannot be modified. These four transmission functions contain predetermined frequency responses for the following materials: **wood, metal, glass, and wall panels**. These are intended for use with surface acoustic speakers and can be transferred directly to the **Smallwonder Amp**.

The fifth transmission function is reserved for free editing/setting. It can be adapted to the user's individual sound/audio preferences as well as to the material used (if surface acoustic speakers are used).

The profile of the frequency response is represented as a curve in real time. The diagram shows the output level (in dB) depending on the frequency (in Hz or KHz respectively).

Equalizer



It is possible to modify the equalizer transmission function of the amplifier. Changes to all settings are acoustically perceptible right away. This way, the user is able to adjust the **Smallwonder Amp** to his personal listening preferences and habits and optimize the surface acoustic speakers.

The equalizer is divided into a left and a right channel. The channels can be set up dependent from one another or independently. If the function "left and right channel simultaneous" is active, the two curves are independent from one another. All changes to one channel are adapted by the others.

Using the “Reset” button, the equalizer curve is reset to the zero. All controls are then located at 0dB.

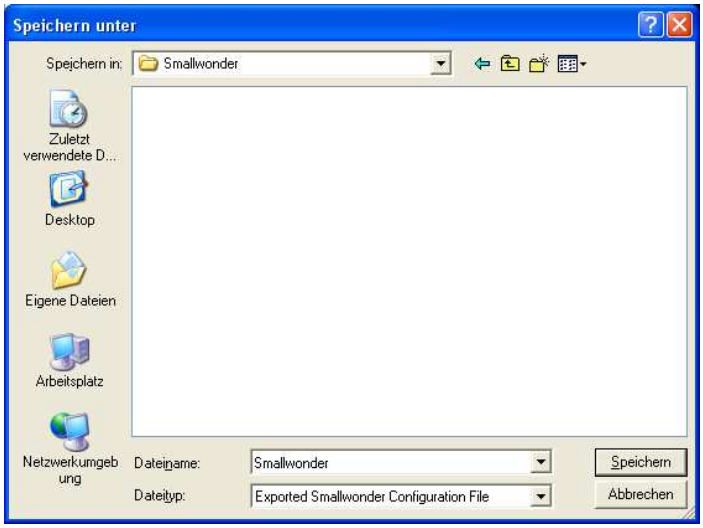
Each channel can be set within a range of thirteen frequencies gradations. If the slide control is changed, the graphic adaptation of the curve in the diagram is modified analogously. **The settings are saved automatically.**

Menu bar

The menu bar is located in the upper section of the Configurator software. The menu bar features additional functions necessary for the operation of the Configurator software. Simply use your mouse to click on the desired function.

The following functions are available in the menu bar:

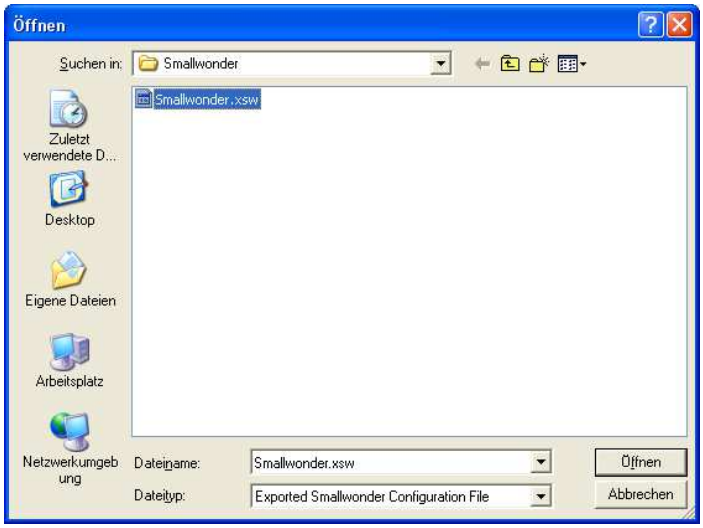
File/Export



With this function, all settings of the Configurator software can be saved completely. To do this, select a destination folder and a matching file name. All settings are saved featuring the extension XSW (E**x**ported **S**mall **W**onder).

With this function, previously made settings can quickly be transferred to other devices. This way it is possible to ensure a time-optimized industrial installation.

File/Import



With this function, the exported settings can be imported under File/Export. After having entered a directory all available XSW-files will be displayed.

File / Exit
With this menu item, the program can be exited.

File / Load default values
With this menu item, all settings of the **Smallwonder Amp** are reset to factory default settings. This applies to settings made via the Configurator software as well as to the settings made via remote control.

Language
The operation of the Configurator software can be executed in different languages. The available languages are displayed and can be selected by mouse click.

It is possible to add new languages to the Configurator software. For industrial users, it is possible to have the software translated into the desired language. For this purpose, the manual can also be translated.

Help / User manual
With this function is it possible to get access to the manual. The manual contains all information necessary for operation. The manual is displayed as a PDF document. Please note that you will need a PDF reader to view the document.

Help / About
This menu item contains general and copyright information.

APP interface

The APP interface is an external interface of the **Smallwonder Amp** that can be controlled individually. It allows the user to control external electrical devices (motors, light control, ventilation, etc.) via a smartphone APP.

To use this application, additional technical developments are possible. These are:

1) Development of a smartphone APP and determination of the control commands

2) Development of a **Smallwonder Amp** firmware featuring a corresponding command analysis

3) Development of an interface between the device to be controlled and the amplifier

Standard **Smallwonder Amp** amplifiers do not support the APP interface. Devices of the type **Smallwonder Amp2X60 C** (C = customized) support the APP interface. It is ensured that only the APP of the corresponding client actually works with **Smallwonder**. **Smallwonder** APPs from other customers are not compatible with the **Smallwonder**.

The control commands are acoustically transmitted in short units via Bluetooth. Normally they cannot, or only very briefly, be heard. It is possible to issue different digital control commands via the APP different interface.

The effort required to develop a customized smartphone APP is high. Generally, development of an APP only pays off if the corresponding numbers to be expected in an industrial manufacturing (e.g. in furniture, kitchen or automobile industry) are comparatively high.

We are happy to advise you on the possibilities and conditions for the development of a customized APP.

We would like to define the possible functions of an app by the following example.

Task: A manufacturer of extractor hoods wants to equip its products with the **Smallwonder Amp** amplifier. The user should be able to easily play music from his smartphone in the kitchen. He also wants to offer its clients to have the possibility to comfortably switch the extractor hood and the light on and off via using his smartphone as a remote control.

Implementation: First of all, the various control commands will be defined in cooperation with the customer. These are e.g. light on/off and a multi-level fan control. Next, comes the setting of APP's design. This step is followed by the development of the adaptation of the electronics so that it matches APP interface of the **Smallwonder Amp**. For this purpose, the universal interface provides a variety of options. In the next step, the various smartphone APPs are programmed (usually Android and Apple / iOS). Also, the **Smallwonder Amp** firmware must be developed.

After a successful running of the test phase, the unit must be CE certified and can then be released for sale

Optional equipment

The optional equipment listed below can be ordered separately. Depending on the installation situation, it may be helpful to add or combine various optional add-on components.

230 V Industrial power supply Article: SWA-PS

The power supply SWA-PS is a powerful industrial power PS designed for installation and continuous operation. It is operated at 100-240V / 50/60 Hz supply voltage and can thus be directly integrated into furniture and substations. Power supplies featuring deviating characteristics are available on request.

Technical data:

Input voltage:	100 – 240 V AC, 50/60 Hz
Output voltage:	12V DC (24V DC available on request)
Output current:	6 A
Efficiency:	87 %
Operating temperature:	-20°C - +70°C, no condensing humidity
Size:	129 x 98 x 38 (L x W x H in mm)
Weight:	450 g
Material:	Metal case
Certificates:	Security checks UL60950-1, TÜV EN 60950-1
MTBF :	620.000 h, MIL-HDBK-217F

External Bluetooth pairing push button Article: SWA-BPT

Especially in the public sector and the tourism and hotel industry we recommend to install an external Bluetooth pairing push button (for example in hotels, on cruise ships, etc.).

Pairing via a Bluetooth wireless interface of the **Smallwonder Amp** is only possible when the locally installed push button has been operated by an authorized user. This prevents unauthorized persons from gaining access to the device to play music or use already activated devices.

The push button can be installed hidden from view or incorporated into the design so that it appears to be a part of the furniture. The cord length is 1.5 m. If necessary, it is possible to additionally order connectors that can be connected to both the external IR receiver and the Bluetooth pairing push button.

External IR receiver Article: SWA-IRE

The **Smallwonder Amp** is often installed at sites that are hidden from view. The installation situation may cause that signals from the IR remote control are not (or only erratically) be detected by the **Smallwonder Amp**.

In order to guarantee a safe and reliable operation via IR remote control for covert installation sites, an external IR receiver can be employed. It is connected to the APP interface of the **Smallwonder** Amplifier via a cable of 1.5m length. If required, it is possible to order plug connectors which can be connected to both the external IR receiver and the Bluetooth pairing push button.

Due to the small size, the IR receiver is inconspicuous and can smoothly be integrated into an already-existing design.

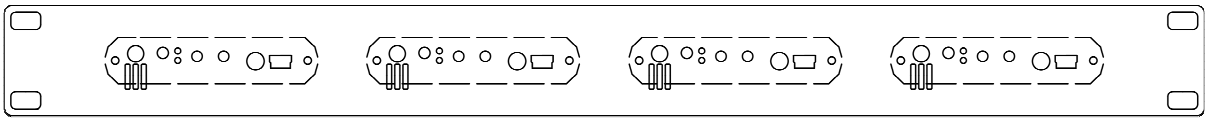
External Bluetooth antenna Article: SWA-ANT

Depending on the installation situation, the Bluetooth reception range of the **Smallwonder Amp** amplifier can be restricted. Also, some Bluetooth devices have a very limited transmission power.

By connecting an external Bluetooth antenna, the range can be increased to great extent. Even more powerful outdoor antennas are available on request

The installation of the external Bluetooth antenna must be performed by trained personnel only. To do so, one has to open the device and separate a solder bridge.

19" Carrier frame for rack mounting Article: SWA-RACK



If several **Smallwonder** amplifiers are used, it is possible to use a 19" industrial rack for installation.

The 19" mounting frame allows you to mount up to four amplifiers in a construction height of 1HE. To do so, one needs to remove the front panel and screw the amplifier 19" mounting frame. This should be carried out by trained and authorized personnel only.

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Installation of surface acoustic speakers

The installation position of surface acoustic speakers has a strong influence on the sound quality and the expected volume. Especially when it comes to mass production (e.g. of furniture), it is vital to accurately determine the ideal installation position by means of special test procedures. This service (which is also available in mobile form) is offered by heddier electronic.

The surface acoustic speakers (Article: LS-KS) by heddier electronic GmbH can be ordered on demand.

Brief instruction for the installation of surface acoustic speakers

①

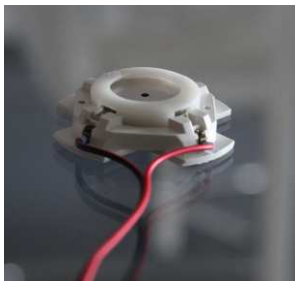
Place the surface acoustic speakers at the desired location and press down firmly on the surface while holding it at the outer lashes. Do not exert too much pressure and mind not to get in touch with the high-performance magnets.

②

You will immediately sense changes to the sound quality. Repeat this process until you have found the ideal position for installation.

Once you have located a good adhesive, level surface, remove the four protector papers of the outer lashes. The surface shall be cleaned of grease and grime.

③



Squeeze the surface acoustic speaker to the desired surface and simultaneously apply pressure to all four outer lashes. Please note that you should wait for 6 hours before you start operating the surface acoustic speakers so that the adhesive has sufficient time to dry completely.

Note: The only use of adhesives to install the surface acoustic speakers is only recommended for homogeneous and smooth surfaces such as glass.

④

If the surface allows for installing the surface acoustic speakers with screws, this installation method should be prioritized. Surface acoustic speakers create a strong kinetic energy, which strongly encumbers the adhesive when glued to a surface that is not optimal for installation.

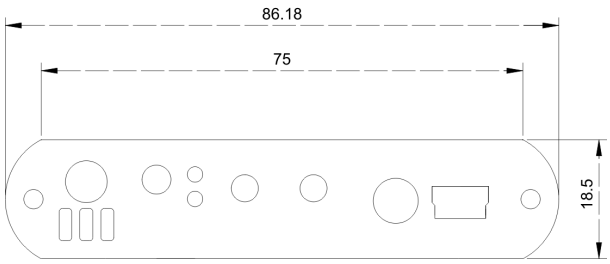
Please note to only tighten the screws inasmuch as the surface acoustic speaker is securely attached to the surface. Do not tighten the screws too firmly as it would compromise the sound quality.

Technical data

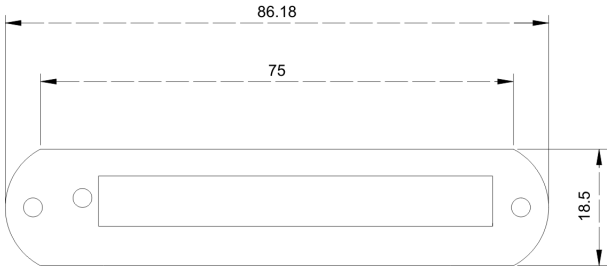
Type:	2-channel - 60 watt class D amplifier with DSP, 4 - 8 ohms impedance
Frequency range:	20 Hz to 20 kHz
Max. power:	2 x 60 watt maximum or 1 x 120 watt
Size in mm:	86L x 90W x 18.5H (case size without connectors)
Operating voltage:	12 - 24 volt DC, max. 8,5 ampere , efficiency > 80%
Operating temperature:	-20° - +70°C, no condensing humidity
Connections:	Operating voltage 12 - 24 V DC, Euroblock Sensor input, Euroblock Audio Out, 2 x 2-pole, Euroblock Audio In, H/L-Level, 4-pole, Euroblock 3.5 mm stereo jack Audio-In 6-pole multi-functional jack for expansions IR receiver for optional remote control USB interface for programming 2 x control-LED red/green DIP switches for system settings VOL+ / VOL- push buttons
Other functions:	Reverse polarity and fuse protection Monitoring of operating voltage Short circuit proof and thermal protected power amplifier Car Audio On (Auto power on upon audio signal) Self-test function upon power on Support IR remote control Bluetooth Module for A2DP audio streaming and AVRCP protocol Preset transmission functions for wood, glass, metal...
Software functions:	13-channel parametric equalizer feat. graphic display Multilingual menu navigation Self-diagnostics with storage of operating parameters Switchable audio inputs and outputs Saving of individual transmission functions (pre-settings) Channel mixer with pseudo-stereo and pseudo-mono Deep bass equalizer Balance and master volume functions
Scope of delivery:	Amplifier module, cables, remote control and CD-ROM

Technical drawings and drilling template

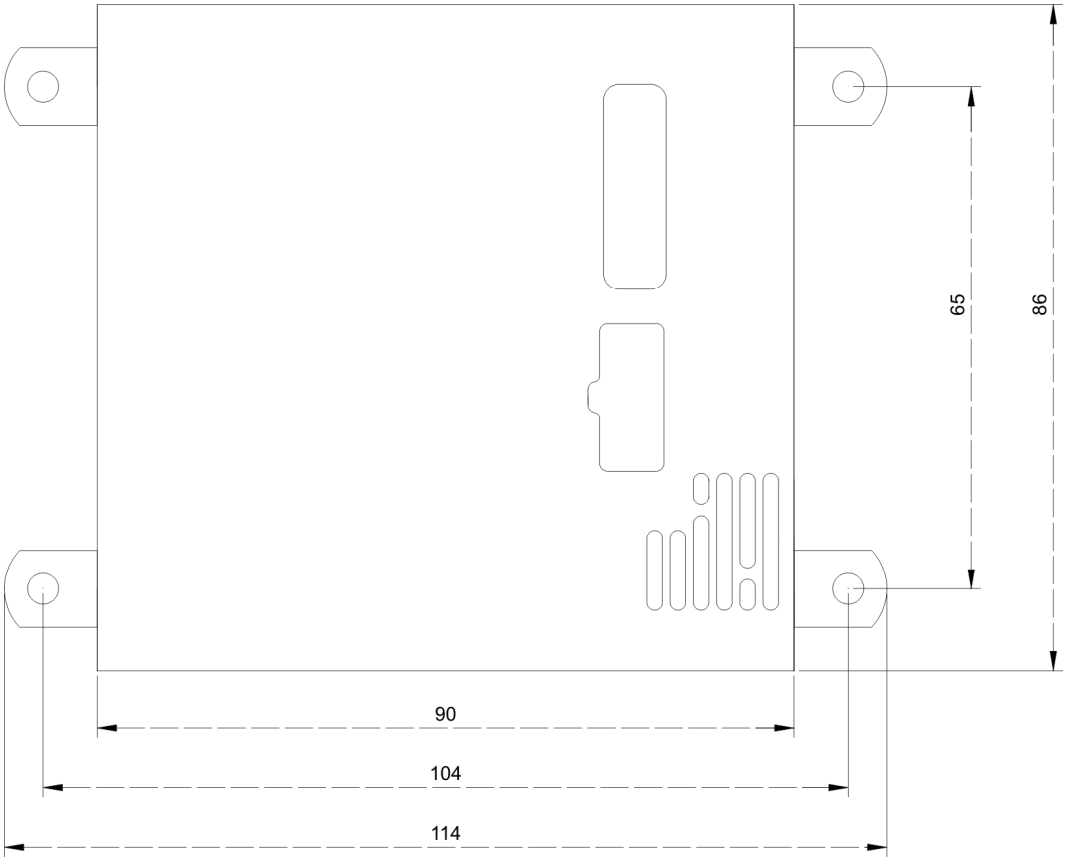
Drawing of panel



Drawing of connector panel



Drawing of drilling template



Caution! Slight deviations may occur when printing the drawings above. Please check the sizes and measurements prior to performing the drillings.

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Troubleshooting

Error: **The Smallwonder Amp turns off during operation**

Possible solution: The **Smallwonder Amp** has various protection mechanisms. Please see chapter "Description of functions - protection mechanisms" for more information on how the protection mechanisms operate.

If the **Smallwonder Amp** switches off after, for example, having been set at a high volume level, note: The **Smallwonder Amp** automatically re-starts after a short resting phase. The volume is re-set to default mode and normal operation is possible again.

If the excessively loud default volume set through the Windows software or the IR remote control, it must be reset to a lower volume before restart.

Error: **Illumination/flashing of status LEDs of the Smallwonder Amp.**

Possible solution: Please refer to the operating status of the **Smallwonder Amp** in the overview in chapter "Functional descriptions - LED status" to further localize the error and narrow down the solutions.

Error: **Remote control does not function.**

Possible solution:

Check the battery of the remote control and replace if necessary. Please observe the regulations for the recycling of batteries.

Remove the plastic protective film from the lithium battery. The plastic protective film provides protection during transport.

Check whether operation of IR remote control is activated. The DIP-switch 10 must be set to ON.

If the DIP-switch 8 is set to ON, an external IR receiver must be connected.

Next, check if the remote control is transmitting signals. When pressing the key, the remote control's IR signals can be made visible by looking through a camera (e.g. via a mobile phone).

If the error persists, check the installation situation of the **Smallwonder Amp**. The remote control's receiver is located in the front panel of the **Smallwonder Amp**. For optimal function, the receiver needs to be within eyeshot of the remote control.

Error: **The Smallwonder Amp is not identified as a Bluetooth device.**

Possible solution: Check if the device is turned on and ready for operation. Next, reduce the distance between yourself and the **Smallwonder Amp**.

Depending on which Bluetooth pairing mode is active, refer to the notes in the corresponding chapter "Functional descriptions - Bluetooth pairing".

Error: **The Smallwonder Amp is identified as a Bluetooth device, but a connection is not possible.**

Possible solution: Make sure that the device is currently not used by another person. Before pairing with a new device can be carried out, the old one must be "separated" from the **Smallwonder Amp**.

Error: **Distorted transmission of music during playback.**

Possible solution: Transmission via wireless Bluetooth is limited in range. This may vary widely depending on the manufacturer and the transmitting device.

To achieve a maximum range, make sure that your Bluetooth device is not set to power saving mode. This may limit the range.

Also check the installation situation of the **Smallwonder Amp**. A shielded position can greatly limit the range. If you cannot change the mounting position, it is possible to order a model of the **Smallwonder Amp** that features a higher performing external Bluetooth antenna. This increases the range.

For more information please contact heddier electronic GmbH.

Error: **The audio stream is running on the Bluetooth device, but there is no output from the amplifier.**

Possible solution: Check the volume setting of the **Smallwonder Amp** and adjust if necessary.

Next, check the selected playback source. For test purposes, you can change the playback source by using the IR remote control.

Warranty conditions

The warranty period is 2 years from the date of purchase. Varying warranty conditions for commercial customers result from the terms and conditions of heddier electronic GmbH. In the case of a warranty claim, the user is allowed to send in device to his local distributor for repair. With each repair, proof of purchase must be presented to the dealer within the warranty period. The services included in the warranty cover all replacement parts and labor costs necessary for repair.

The entitlement to the aforementioned warranty is cancelled in the event of improper use. Likewise, the warranty expires after opening of the device as well as after performing technological changes by unauthorized persons. The manufacturer's liability is excluded for damage that occurs during transport to the service workshop.

Procedure in the event of a warranty repair

The **Smallwonder Amp** amplifier should be brought or delivered to the dealer in its original box or comparable packaging. The manufacturer is not responsible for safe delivery by the carrier. Therefore it is recommended to take out a transport insurance against loss, theft and damage.