Spectera

PDF export of the original HTML instructions

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1. Preface

PDF export of the original HTML instructions

This PDF document is an automated export of an interactive set of HTML instructions. It may be the case that not all contents and interactive elements are contained in the PDF as they cannot be presented in this format. Furthermore, automatically generated page breaks may cause coherent contents to be moved slightly. We can therefore only guarantee the completeness of the information in the HTML instructions, and recommend that you use these. You can find these in the download section of the website under www.sennheiser.com/download.

2. Product information

All information about the product, the scope of delivery and the available accessories.

Spectera System
Base Station
SEK
DAD
Accessories
Accessories for the Base Station
Accessories for the SEK
Accessories for the DAD
CHG 70N-C network-enabled charger
BA 70 rechargeable battery and L 70 USB charger
Modular L 6000 charger
Charging modules for L 6000 charger

Spectera System

Sensing Capabilities - Audio detection and transmission

Spectera devices (Base Station, DAD, SEK) build audio transmission system for professional use. Once paired, SEK mobile devices can transmit audio signals captured by a connected microphone over radio frequencies. Due to its bi-directionality, the SEK is able to receive audio signals from DAD and the sound comes out of the headphones, if any connected. Here how it works:

Transmission:

- The SEK picks up sound from microphone and turns it into electrical signals.
- These signals are then prepared for transmission by boosting and modifying them.
- The signals are sent over radio waves to the DAD Antenna.
- The DAD antenna changes the radio back into electrical signals and sent them to the Base Station for further audio processing.

Receiving:

- The Base Station forward audio signals to the DAD Antenna.
- These signals are then prepared for transmission by boosting and modifying them.
- The signals are sent over radio waves to the SEK mobile devices.
- The SEK changes the radio back into electrical signals and at a further stage, sound will be directed to connected headphones.

Base Station

Base Station | 1350 - 1525 MHz | Art. no. 509162

The license for the Base Station is available in the following versions:

Name	Art. no.	Frequency range	Certified Countries*
SPECTERA LIC (ZONE 01)	700 532	UHF (470 - 608 MHz, 630 - 698 MHz) 1G4 (1350 - 1400 MHz)	EU + EFTA, United Kingdom, Turkey
SPECTERA LIC (ZONE 02)	700 533	UHF (470 - 608 MHz, 657 - 663 MHz) 1G4 (1435 - 1525 MHz Certification pending)	USA
SPECTERA LIC (ZONE 03)	700 534	UHF (470 - 608 MHz, 657 - 663 MHz)	Canada
SPECTERA LIC (ZONE 04)	700 535	UHF (470 - 534 MHz, 534 - 608 MHz, 630 - 698 MHz)	Singapore
SPECTERA LIC (ZONE 05)	700 536	UHF (470 - 608 MHz, 630 - 698 MHz) 1G4 (1350 - 1400 MHz)	South Africa - Certification pending
SPECTERA LIC (ZONE 06)	700 537	UHF (470 - 608 MHz, 630 - 694 MHz)	Malaysia, Qatar
SPECTERA LIC (ZONE 07)	700 538	UHF (470 - 510 MHz)	Israel - Certification pending
SPECTERA LIC (ZONE 08)	700 539	UHF (487 - 608 MHz, 630 - 694 MHz)	Indonesia
SPECTERA LIC (ZONE 09)	700 540	UHF (470 - 608 MHz, 630 - 694 MHz) 1G4 (1350 - 1400 MHz)	United Arab Emirates
SPECTERA LIC (ZONE 10)	700 541	UHF (470 - 608 MHz, 630 - 698 MHz)	Philippines
SPECTERA LIC (ZONE 11)	700 542	UHF (520 - 608 MHz, 630 - 694 MHz)	Australia
SPECTERA LIC (ZONE 12)	700 543	UHF (510 - 606 MHz)	New Zealand

Name	Art. no.	Frequency range	Certified Countries*
SPECTERA LIC (ZONE 13)	700 544	UHF (479 - 565 MHz)	Hong Kong

* It is the responsibility of the user to inform themselves about the current local regulatory and certification requirements and to comply with them using wireless systems.

i You can find more detailed information about the Base Station in the following sections:

- **Startup and operation**: Base Station
- **Specifications**: Base Station

SEK

SEK (UHF)

SEK (1G4)

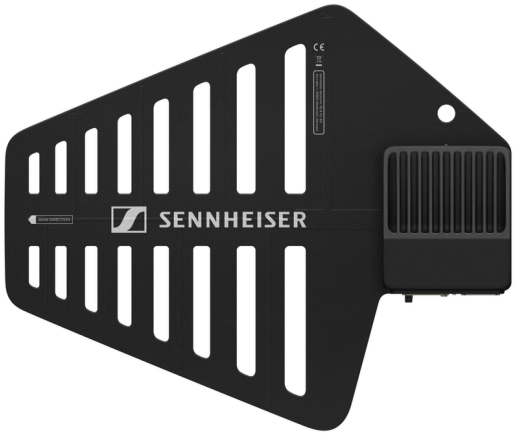
The SEK is available in the following versions:

SEK UHF | 470 - 698 MHz | Art. no. 509164

SEK 1G4 | 1350 - 1525 MHz | Art. no. 509163

> **i** You can find more detailed information about the SEK in the following sections:
>
> - **Startup and operation**: SEK
> - **Specifications**: SEK

DAD



DAD (UHF)

DAD (1G4)

The Digital Antenna Directional (DAD) is available in the following versions:

DAD UHF | 470 - 698 MHz | Art. no. 509169

DAD 1G4 | 1350 - 1525 MHz | Art. no. 509170

> **i** You can find more detailed information about the DAD in the following sections:
>
> - **Startup and operation**: DAD
> - **Specifications**: DAD

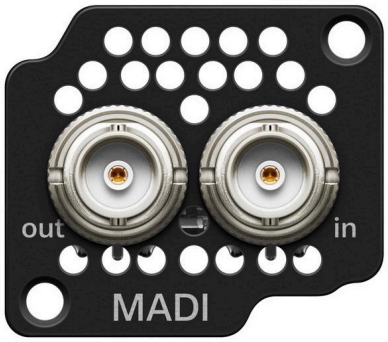
Accessories

Accessories for the Base Station
Accessories for the SEK
Accessories for the DAD
CHG 70N-C network-enabled charger
BA 70 rechargeable battery and L 70 USB charger
Modular L 6000 charger
Charging modules for L 6000 charger

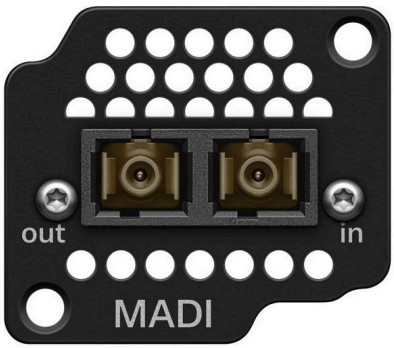
Accessories for the Base Station

MADI Cards

MADI Card (BNC) for Base Station | Art. no. 509293



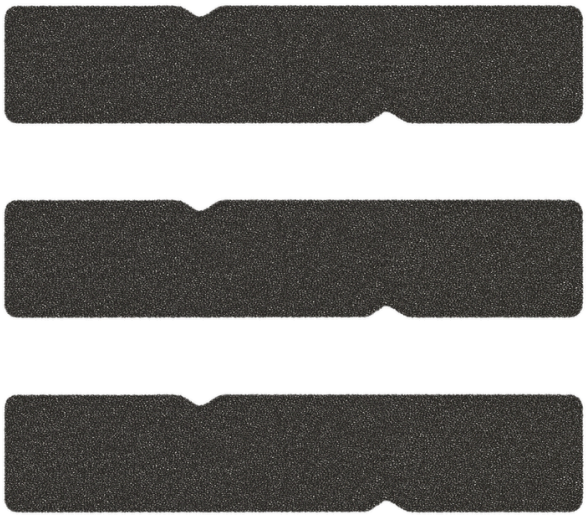
MADI Card (OM) for Base Station | Art. no. 509295



- See Installing slot-in cards

Spectera Filter set

Three exchangable **filters** for the Base Station | Art. no. 700073



- See Changing the fan filter

Accessories for the SEK

Spectera SEK Antenna

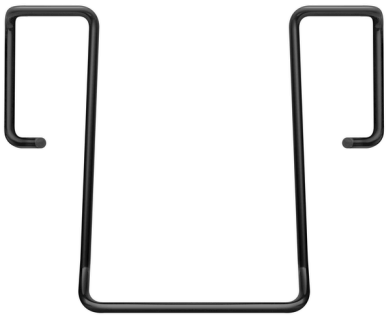
SEK Antenna (UHF) | 470 - 698 MHz | Art. no. 700066

SEK Antenna (1G4) | 1350 - 1525 MHz | Art. no. 700067

- See Mounting the antenna

Spectera SEK Belt Clip

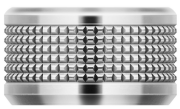
SEK Belt Clip | Art. no. 700071



- See Changing the belt clip

3-pin protective cap MIC/LINE

Exchangeable protective **cap** for the microphone / instrument 3-pin connector | Art. no. 700072



- See Using the protection cap

Accessories for the DAD

Optional cables for DAD

Antenna cable cat 5e | 10 m | Art. no. 700068

Antenna cable cat 5e | 25 m | Art. no. 700069

Antenna cable cat 5e | 50 m | Art. no. 700070

- See Connecting/disconnecting the antenna

CHG 70N-C network-enabled charger

CHG 70N-C | Charger | Art. no. 700332

CHG 70N-C + PSU KIT | CHG 70N-C charger with NT 12-35 CS power supply unit | Art. no. 700333

> **i** You can find more detailed information about the CHG 70N-C in the following sections:
>
> - **Startup and operation**: CHG 70N-C charger
> - **Specifications**: CHG 70N-C charger | BA 70 rechargeable battery

BA 70 rechargeable battery and L 70 USB charger

BA 70 | Rechargeable battery | Art. no. 508860

L 70 USB | Charger | Art. no. 508861

EW-D CHARGING SET | L 70 USB charger with two BA 70 rechargeable batteries | Art. no. 508862

i You can find more detailed information about the BA 70 rechargeable battery and the L 70 USB charger in the following sections:

- **Startup and operation**: L 70 USB charger
- **Specifications**: L 70 USB charger | BA 70 rechargeable battery

Modular L 6000 charger

The L 6000 charger is used to charge the BA 60, BA 61, BA 62 and BA 70 rechargeable batteries.

The charging modules LM 6060 (for the BA 60), LM 6061 (for the BA 61), LM 6062 (for the BA 62) or LM 6070 (for the BA 70) are required to do so. The rechargeable batteries and charging modules are available separately.

- **L 6000 EU** | Article no. 507300

> **i** You can find more detailed information about the L 6000 charger and the LM 6060, LM 6061, LM 6062 and LM 6070 charging modules in the following sections:
>
> - **Installation** and **Operation**: Modular L 6000 charger
> - **Specifications**: Modular L 6000 charger and LM 6060 | LM 6061 | LM 6062 | LM 6070 charging modules

Delivery includes

- 1 L 6000 charger
- 1 mains cables (EU, UK, or US variant)
- 4 dummy caps including screws (preassembled)
- 4 rubber feet
- 1 quick guide
- 1 manual with safety instructions
- 1 manual with technical data and manufacturer declarations

Product overview

View with the charging modules and rechargeable batteries inserted:

View with the LM 6060 charging modules without rechargeable batteries inserted:

View with the LM 6061 charging modules without rechargeable batteries inserted:

Charging modules for L 6000 charger

The following **charging modules** are available for the **L 6000** charger:

LM 6060

The LM 6060 charging module is installed in the L 6000 charger to charge the BA 60 rechargeable battery.

LM 6060 | Article no. 507198

LM 6061

The LM 6061 charging module is installed in the L 6000 charger to charge the BA 61 rechargeable battery.

LM 6061 | Article no. 507199

LM 6062

The LM 6062 charging module is installed in the L 6000 charger to charge the BA 62 rechargeable battery.

LM 6062 | Article no. 508516

LM 6070

The LM 6070 charging module is installed in the L 6000 charger to charge the BA 70 rechargeable battery of the Evolution Wireless Digital series.

LM 6070 | Article no. 509457

3. User manual

Detailed description of the start-up and operation of your selected hardware.

Instruction manuals about controlling the Spectera System via LinkDesk and Spectera WebUI can be found here:

- Instruction manual LinkDesk
- Instruction manual WebUI

Base Station
SEK
DAD
CHG 70N-C charger
L 70 USB charger
Modular L 6000 charger
Cleaning and maintenance

Base Station

Get started
General information for the System
Product overview
Installing slot-in cards
Connecting/disconnecting the Base Station to/from the power supply system
Connecting to a network
Connecting antennas
Antenna cable extension
Connecting word clock
Word clock scenarios for digital audio
Connecting audio via Dante®
Connecting audio via MADI
Changing the fan filter
Installing the Base Station in a rack
Switching the Base Station on and into standby
Activating a license
Using the headphone output
Meaning of the LED
Information on the display
Navigating the menu
Menu structure
Updating the Base Station

Get started

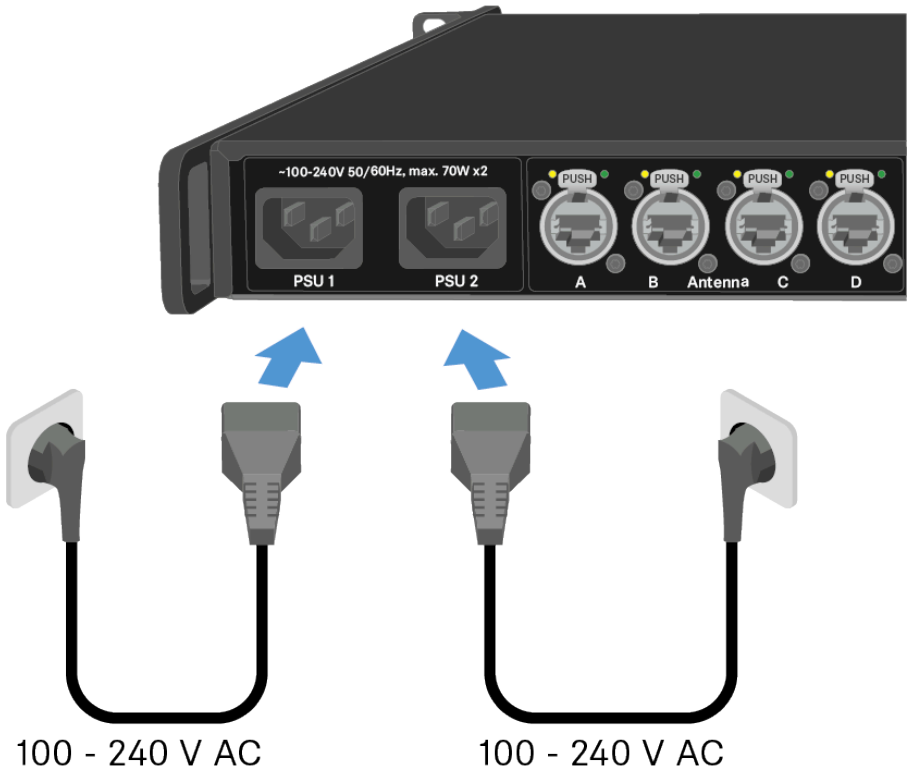
Get your Base Station ready to use in a few steps.

After unpacking the Base Station you must update the firmware **before** activating a licence.

ℹ If you use LinkDesk the update is mandatory before activating a licence.

To connect the Base Station to the power supply system:

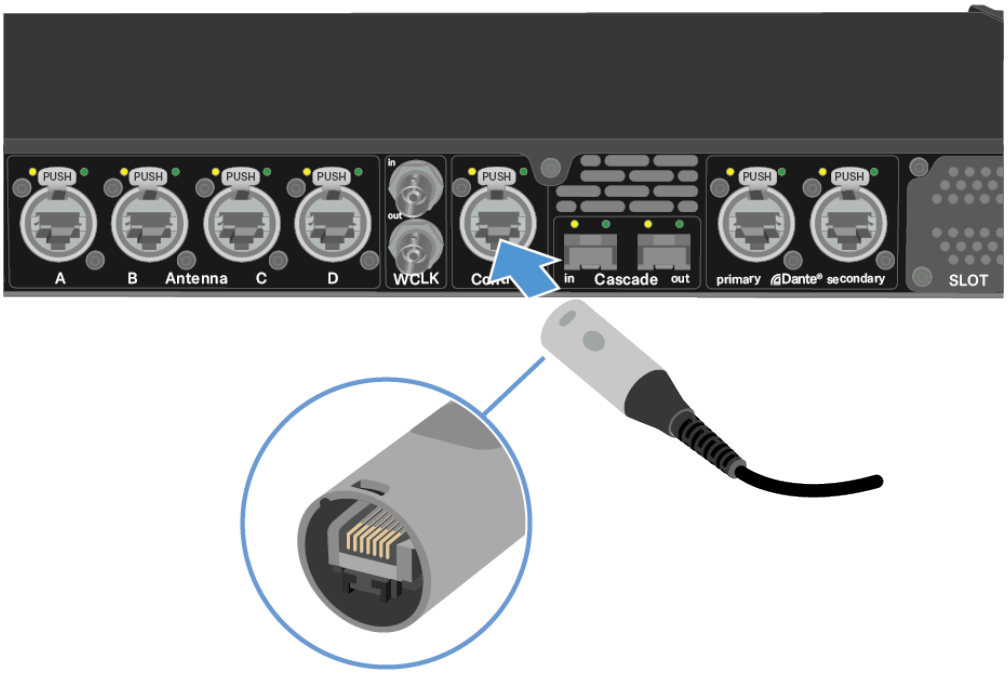
- Connect one mains cable to the power socket on the rear side of the Base Station.



- Connect one mains cable plug into a suitable wall socket.
  - The Base Station is connected to the power supply.

To connect the Base Station to a network:

- Plug one side of the network cable into the **Control** socket.



- Plug the other side of the network cable to a switch, router or directly to a computer.
  - The Base Station has been connected to a network.

To update the firmware:

- If you want to use Spectera WebUI, it depends on the initial firmware version:
  Firmware 0.8.x use `https://deviceIP/specteracontrol/index.html`.

  Firmware 1.x.x use `https://deviceIP/specterawebui/index.html`.

  > The device IP can be found here: Network.

  - In some cases the internet browser might have trouble showing the page. Please use the LinkDesk software.
- If you want to use the free LinkDesk software: Download it from the Sennheiser website sennheiser.com/linkdesk.
  The update is mandatory before activating a licence.

✓ Your Base Station is up to date.

You can now add a licence, see Activating a license.

General information for the System

Here you can find general information for your use of the System.

> **i** A license has to be activated, otherwise you cannot use the Base Station.

The Base Station has two independend RF channels. Both variants of the antenna (UHF and 1G4) can be connected to the Base Station at the same time.

You can pair up to 128 mobile devices to a Base Station within one RF channel.

> **i** Mobile devices can only be paired and operated with one Base Station at a time.

Product overview

Front

1 HEADPHONES socket

- see Using the headphone output

2 VOLUME control for headphone

- see Using the headphone output

3 Fan inlet with filter

- see Changing the fan filter

4 Display for status information and operating menu

- see Information on the display

5 LED to indicate the status

- see Meaning of the LED

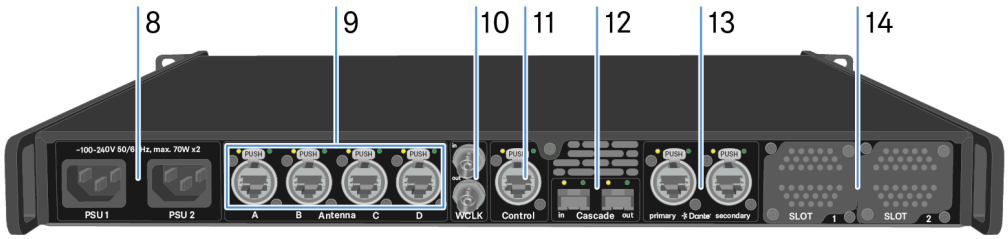
6 Jog-Dial **(UP/DOWN/SET)** for navigating the menu

- see Navigating the menu

7 ON/OFF button

- see Switching the Base Station on and into standby

Back



8 Power socket

- see Connecting/disconnecting the Base Station to/from the power supply system

9 4x ruggedized RJ45 **Antenna** ports

- see Connecting antennas

10 Word clock in/out

- see Connecting word clock

11 ruggedized RJ45 **Control** port

- see Connecting to a network

12 Cascade in/out

- see Cascading the Base Stations

13 2x ruggedized RJ45 ports for **Dante®** primary | secondary

- see Connecting audio via Dante®

14 Slot 1 | 2 for MADI Cards

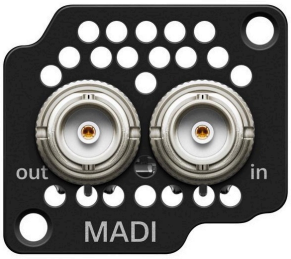
- see Installing slot-in cards

Installing slot-in cards

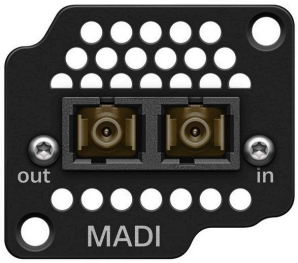
The same or different cards can be installed.

Two types of MADI Cards are available, see MADI Cards.

Madi CARD (BNC)



Madi CARD (OM)



⚠ CAUTION

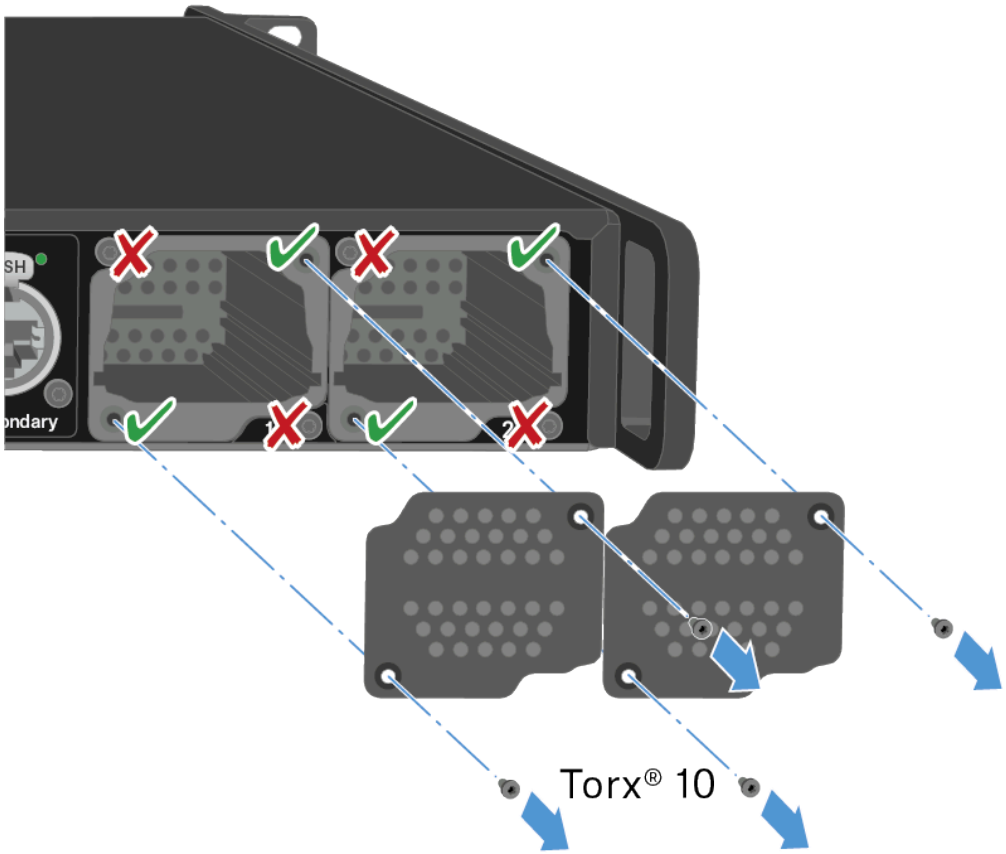
Improper handling of the device may result in its damage

Device contains sensitive electronics to electrostatic discharge (ESD).

- Observe the precautionary measures for handling components at risk of electrostatic discharge and take appropriate protective measures when touching the device.

To install a MADI Card in the Base Station:

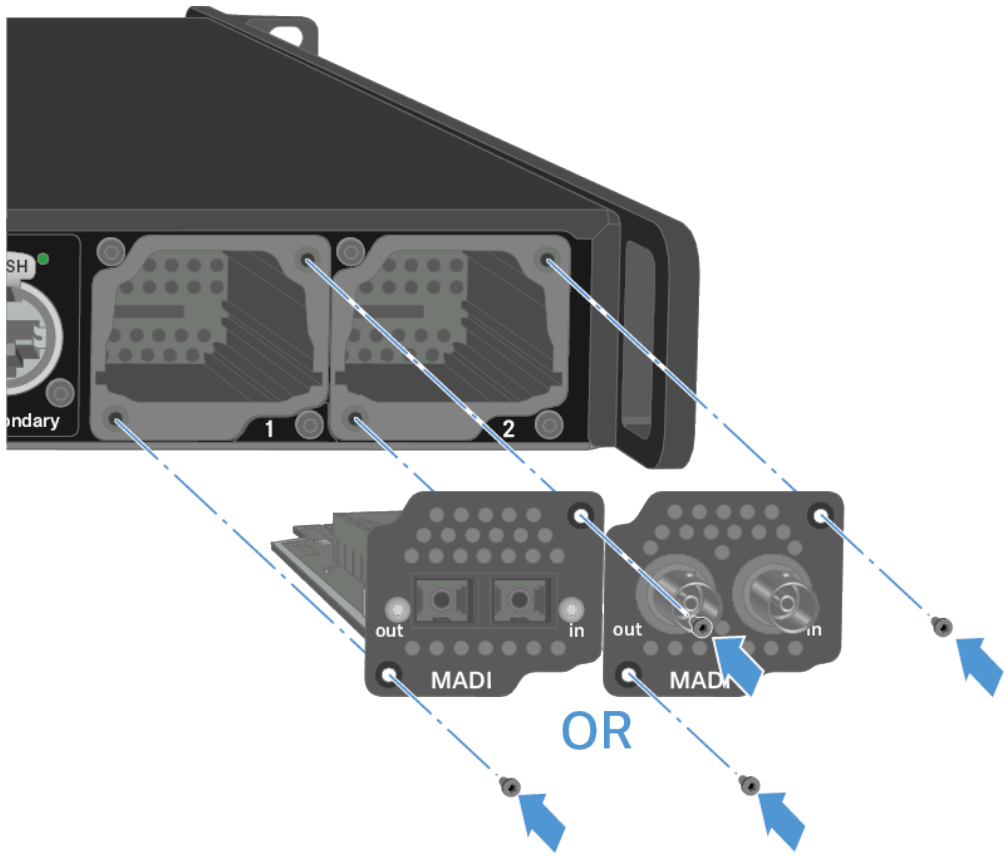
- Completely disconnect the Base Station from the power supply system. See Connecting/disconnecting the Base Station to/from the power supply system.
- Unscrew one of the dummy caps on the Base Station. To do so, you require a torx® 10 screwdriver.



- Fully slide the MADI Card into the open slot as shown in the figure.

  The card can be inserted into the Base Station housing only in one direction. The lettering on the card must face upward.

- Tightly screw on the MADI card with max. 65 cNm +/-10%.



The MADI Cards can be used directly.

A MADI Card has been installed.

Related information

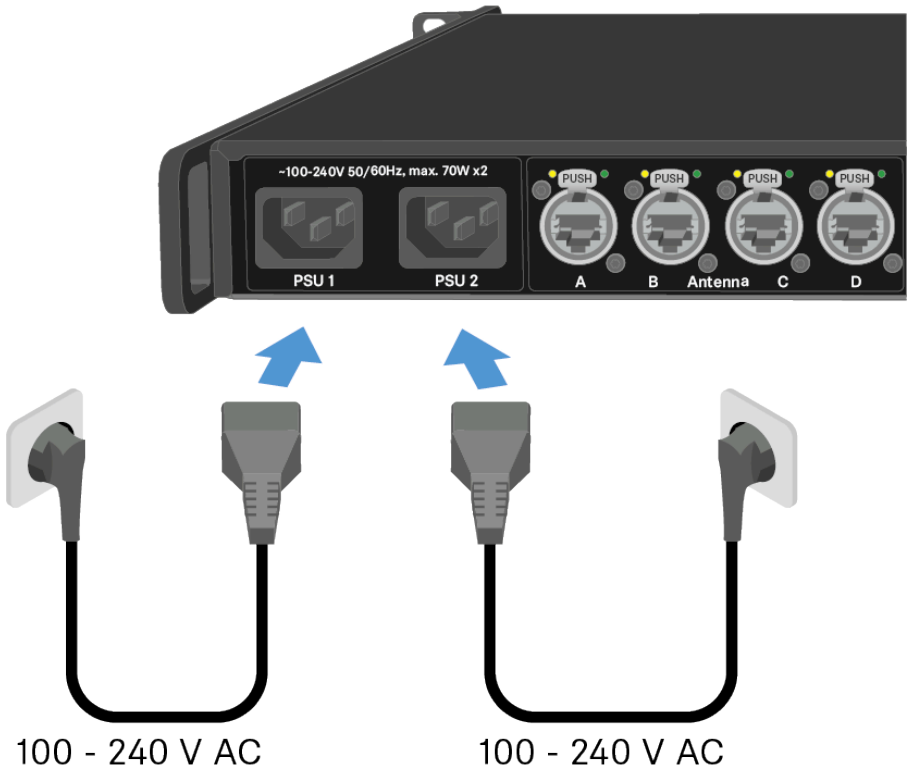
Connecting audio via MADI

Connecting/disconnecting the Base Station to/from the power supply system

Optional for redundancy you can connect the Base Station with two cables. The optional cable is not included.

To connect the Base Station to the power supply system:

- Connect one mains cable to the power socket on the rear side of the Base Station.



- Connect one mains cable plug into a suitable wall socket.
  - The last state is restored: on or standby.
- For redundancy connect an other cable (not included) as well.
  - The Base Station is connected to the power supply.

To completely disconnect the Base Station from the power supply system:

- Unplug both mains cable plugs from the wall socket.
- Unplug both mains cable from the power socket on the rear side of the Base Station.
  - The Base Station is completely disconnected from the power supply.

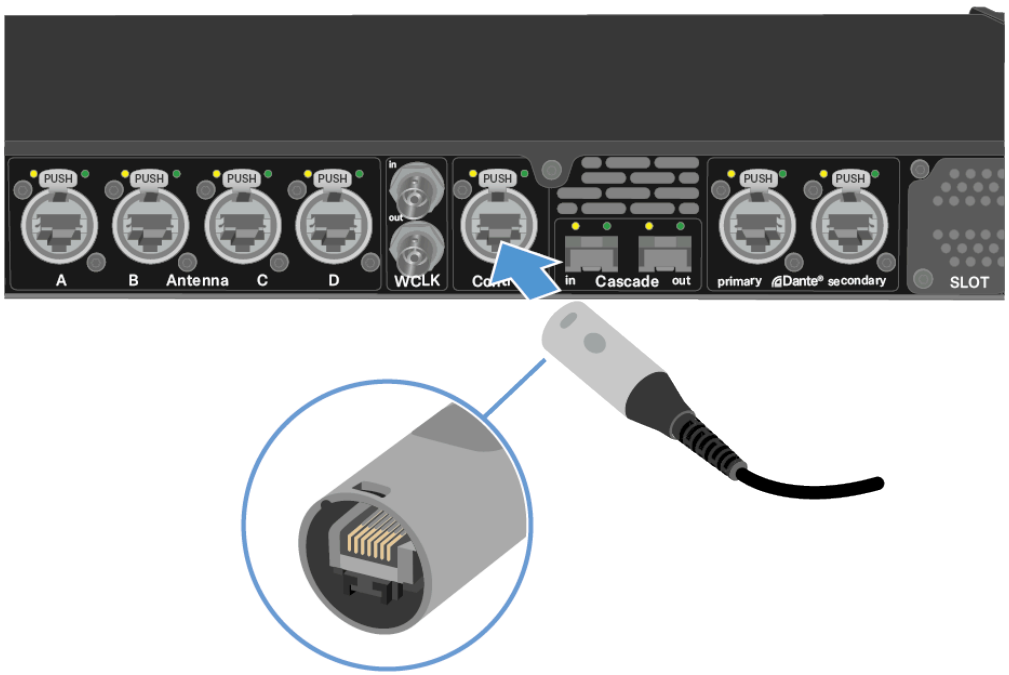
The Base Station has been connected/disconnected successfully.

Connecting to a network

Connect the Base Station to a network for monitoring and controlling.

To connect the Base Station to a network:

- Plug one side of the network cable into the **Control** socket.



- Plug the other side of the network cable to a switch, router or directly to a computer.

> **i** An internet connection is only necessary for activation. See Activating a license.

✓ The Base Station has been connected to a network.

You can monitor and control the Base Station via a network connection using LinkDesk or Spectera WebUI.

LinkDesk is freely available and can be downloaded directly from the Sennheiser website.

- sennheiser.com/linkdesk

To start the Spectera WebUI, enter the following URL into your browser:

- `https://deviceIP`

The device IP can be found here: Network.

Connecting antennas

You can connect up to four antennas to the Base Station.

Recommandations regarding the antenna setup:

- Keep a distance more than 20 m (787.4") between the antenna and another antenna.
- Keep a distance more than 0.5 m (19.69") between the antenna and a wall.

The cable must

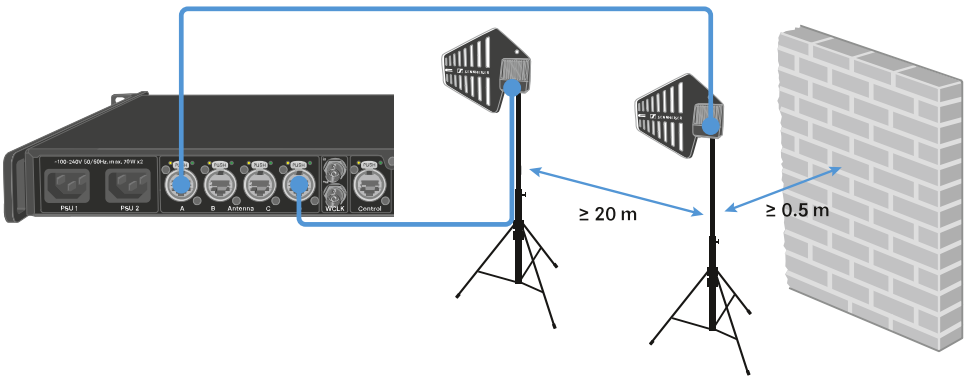
- be a CAT5e or higher,
- have ruggedized plugs and
- not extend 100 m (3937").

> **i** We recommend using a antenna cable cat 5e (see Accessories for the DAD).

> **i** Both variants (UHF and 1G4) can be connected to the Base Station at the same time.

To connect an antenna to the Base Station:

- ▶ Plug on side of the cable into one antenna port (A, B, C or D) at the rear side of the Base Station.
- ▶ Plug the other side of the cable into an antenna.



To disconnect an antenna from the Base Station:

- ▶ Hold down the push button.
- ▶ Unplug the cable from the Base Station.

✓ The Base Station has been connected to/disconnected from an antenna.

Related information
Antenna cable extension

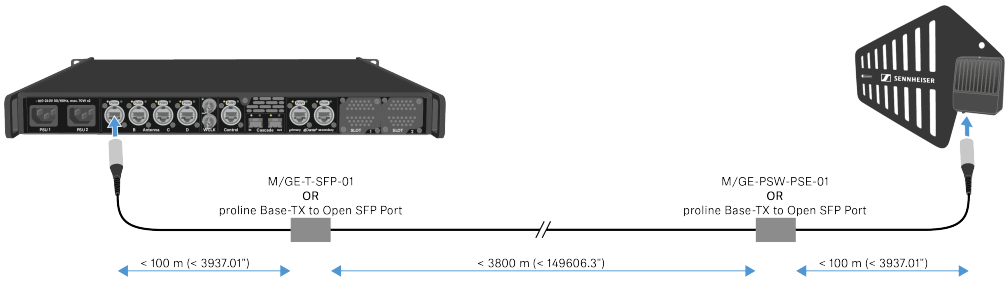
Antenna cable extension

Longer cable distances are possible with the use of fiber optic cables and media converters.

Sennheiser tested the recommend converters for a complete distance of 4 km (157480.31").

We only recommend the following converters for fully tested functionality:

- Converter with PoE for DAD antenna Lantronix M/GE-PSW-PSE-01
- Converter for the Base Station Lantronix M/GE-T-SFP-01
- Converter for DAD antenna or Base Station proline Base-TX to Open SFP Port POE



ℹ The media converter must not have a switch function.

Connecting word clock

You can use the internal word clock on the Base Station or connect an external word clock.

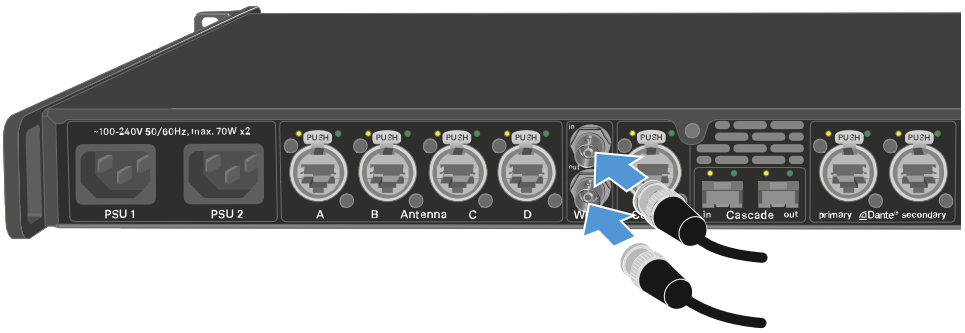
You can also output the external word clock and cascade it up to 8 Base Stations.

The word clock output transmits only the external word clock that is connected via the word clock input. The internal word clock is not output via the word clock output.

> For more information about the word clock, see Word clock scenarios for digital audio.

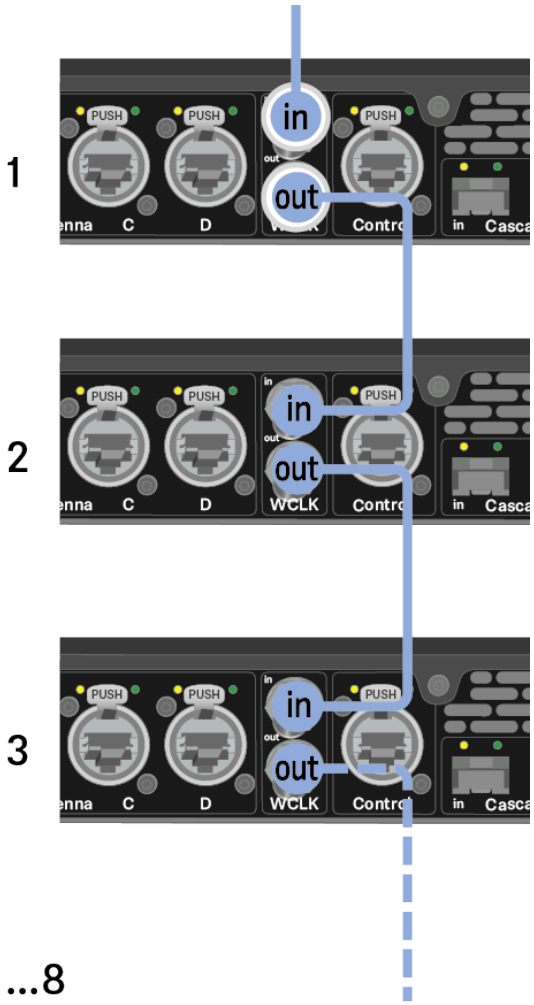
To connect an external word clock:

- Use a coaxial BNC cable (75 Ω) to connect the external word clock to the **word clock in** input.



To cascade the word clock:

- Connect the cable from the **word clock in** input of the next Base Station to the **word clock out** output of the previous Base Station.



✓ The Base Station has been connected to word clock.

Word clock scenarios for digital audio

The Base Station supports two clock rates: 48 kHz and 96 kHz.

You can use either the internal word clock on the Base Station or connect an external word clock.

An external word clock can also be forwarded to a downstream device via the word clock output. This feature allows you to cascade up to 8 Base Station devices.

> **i** Note that only the word clock on the word clock input can be forwarded via the word clock output. The internal word clock is not forwarded via the word clock output.

Word clock with digital audio

If multiple devices with digital audio signals are connected in a production environment, their clock signals must be synchronized via a word clock, otherwise audio errors occur. The word clock of one device becomes the master. All of the other devices become slaves and synchronize with the master.

Dante®

The Audinate Brooklyn III Dante® interface installed in the Base Station should be understood as a standalone digital audio device with its own word clock and also has to be clocked either internally or externally.

> **i** You require the Dante Controller software from Audinate for these settings. You can access it using the link: Dante Controller.

Defining the master and slave

The Base Station word clock input, the Base Station internal word clock, the word clock of the Audinate Brooklyn III Dante® interface, or the Dante® network can be defined as the master.

For LinkDesk see: **Configuring interface settings.**

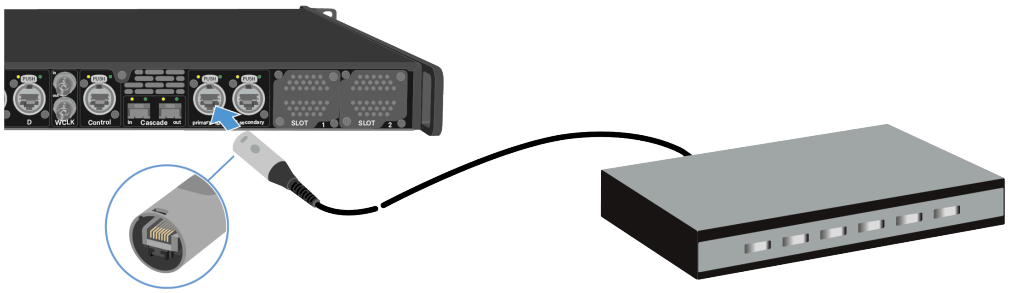
For WebUI see: **Audio interfaces.**

Connecting audio via Dante®

You can input and output audio via Dante®.

To connect audio via Dante®:

- Plug one side of a ruggedized RJ45 cable to the Dante® primary socket.



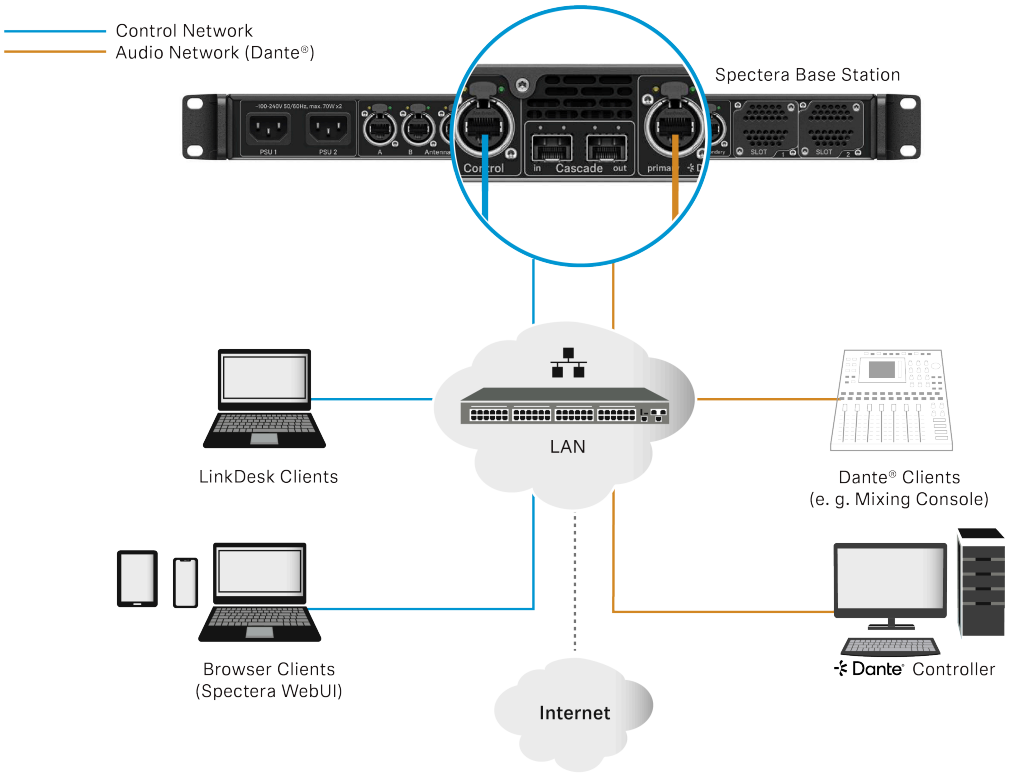
- Plug the other side into a router.
- Download the Dante® Controller.
  This is typically a host computer (PC or Mac), with the Dante® Controller software application installed. This application configures and controls all the Dante® devices and audio streams inside the network.

> **i** Information about the Dante Controller and the Dante® network protocol settings is available on the Audinate website: audinate.com.

✓ The Base Station can input and output audio via Dante®.

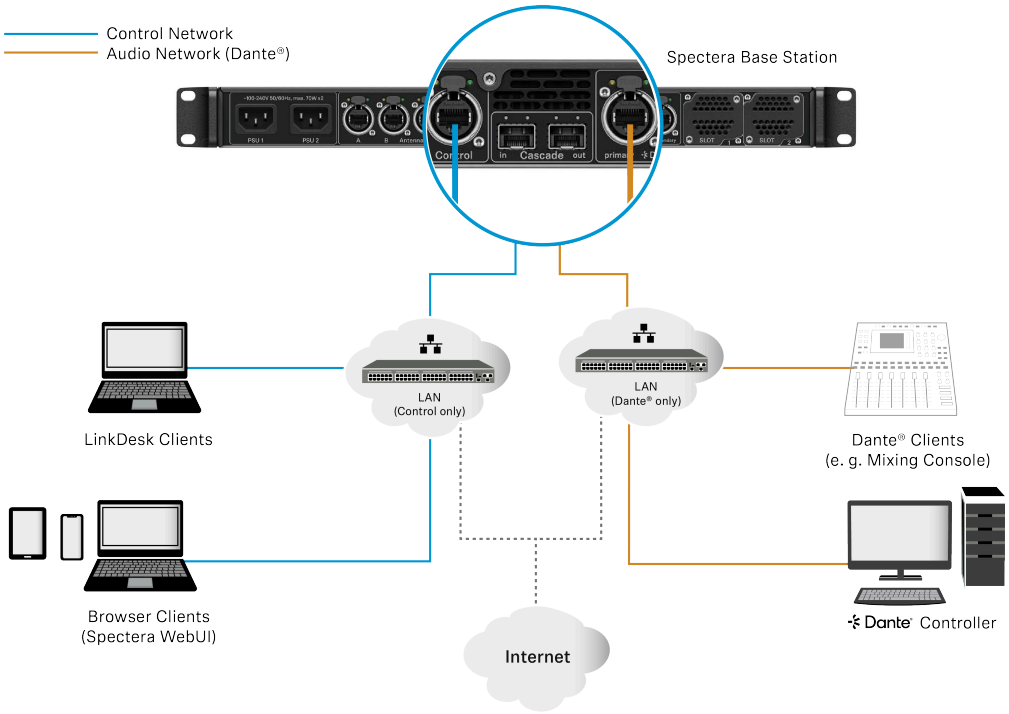
Shared network mode

In Shared Network Mode both networks for Control and Dante® are using the same physical network infrastructure.



Split Network Mode

In Split Network Mode both networks for Control and Dante® are using different physical network infrastructure.

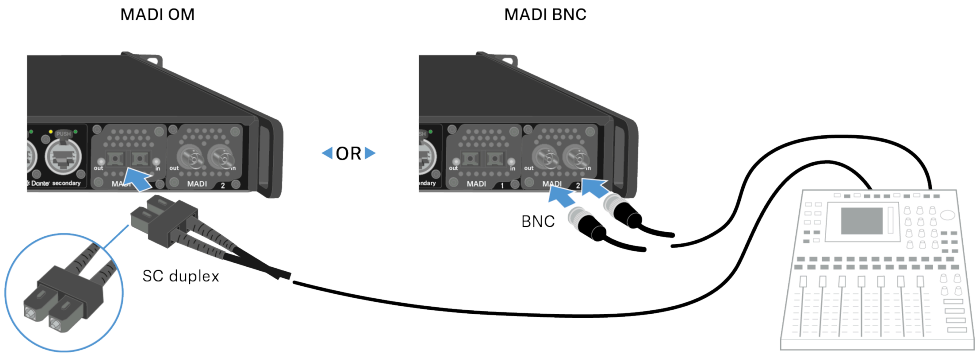


For more information, please refer to the Network & Security Guide, which can be found in the download section on the Base Station product page sennheiser.com/base-station.

Connecting audio via MADI

To connect audio via MADI:

- Plug one side of the (BNC or OM) cable to the installed MADI card.



- Plug the other side of the cable to a mixing console.

✓ The Base Station can input and output audio via MADI.

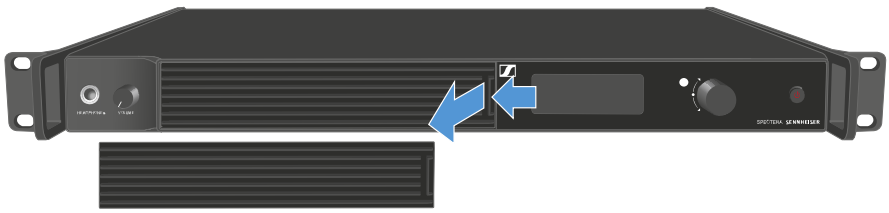
Changing the fan filter

The filter protects the fans from dust.

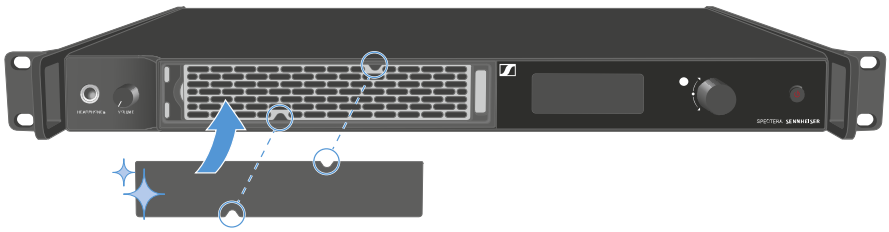
> **i** Check the filter from time to time and replace it to ensure safe operation and sufficient cooling.

To change the filter:

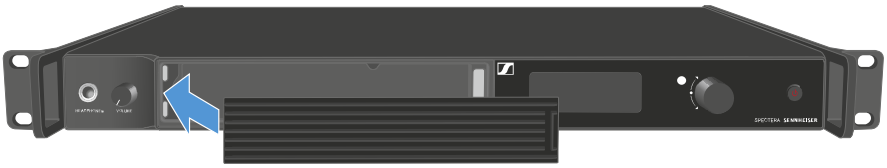
- Switch the Base Station into standby. See Switching the Base Station on and into standby.
- Push down the release and pull the cover forward at the same time.



- Remove the filter and dispose it properly.
- Place a new filter in the Base Station.
  Information about new filter can be found here: Spectera Filter set.
- Make sure that the recesses match those in the device.



- Slide the cover into the left side.



- On the right side, press the cover firmly until you hear it click into place.

✓ The filter has been replaced.

Installing the Base Station in a rack

You can install the Base Station in any conventional 19" rack. The rack mounting angles are already attached to the device.

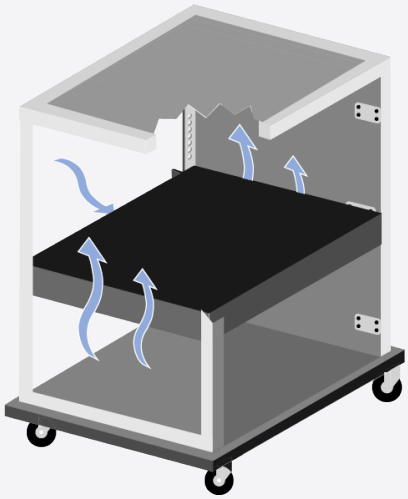
Always observe the following information during rack mounting.

NOTICE

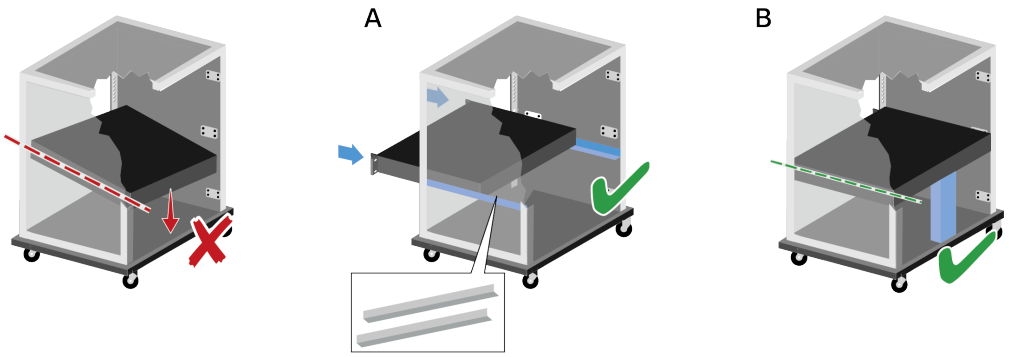
Material damages caused by devices overheating

When there is insufficient ventilation, the devices mounted in the rack may overheat.

- Ensure that there is sufficient ventilation in the rack, particularly if several devices are installed.
- If necessary, install a fan in the rack.



- Support the Base Station after installation in the rack.



Due to the weight and depth of the device, there is a risk that it may break off in the rack and become damaged as a result.

Version A

- Use special rack mounting rails.
- The design of the rack used must be suitable for the installation of these mounting rails.

Version B

- Use a suitable object to support the device on the rear side.
- Ensure that this object cannot become loose.

✓ The Base Station has been installed in a rack.

Switching the Base Station on and into standby

> The Base Station cannot be switched off. You have to disconnect it from the power supply, see Connecting/disconnecting the Base Station to/from the power supply system.

To switch the Base Station on:

- Short-press the **ON/OFF** button.
  - The Sennheiser Logo appears in the display and the Base Station is booting. When booting is done, the power button LED lights up white.

To switch the Base Station into standby:

- Long-press the **ON/OFF** button.
  - The display and the LED go off. The **ON/OFF** button pulses white.

    The DAD goes off.

✓ The Base Station has been switched on/into standby.

Activating a license

> A license has to be activated, otherwise you cannot use the Base Station.

The license specifies the country-specific frequency ranges and the RF power.

You can activate a license via LinkDesk or Spectera WebUI.

Only one license per Base Station is possible.

To activate a license:

- Connect the Base Station to the power supply, see Connecting/disconnecting the Base Station to/from the power supply system.
- Connect the Base Station to a network via a switch or router, see Connecting to a network.

  > The Base Station needs a direct Internet access!

- Connect a computer to the same switch or router.
- If you want to activate a license via LinkDesk, follow the steps described here: Activating licenses.
- If you want to activate a license via Spectera WebUI, follow the steps described here: Activating the license.
- Check the product page sennheiser.com/base-station for the latest firmware.

✓ A license has been activated.

Using the headphone output

You can use the headphone output on the front of the Base Station (6.35 mm jack) to listen to the audio signals of the channels.

i First you have to set up audio links in LinkDesk or Spectera WebUI.

⚠ WARNING

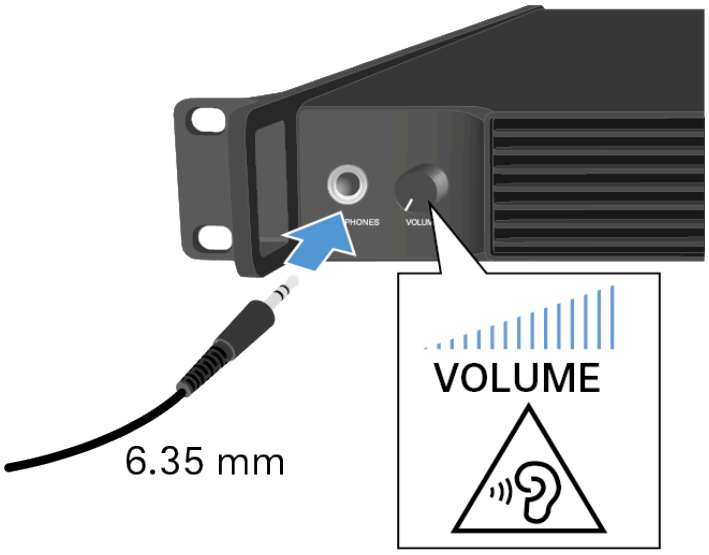
Danger due to high volume levels

Volume levels that are too high may damage your hearing.

- Turn down the volume of the headphone output before you put on the headphone.

To listen to an audio source:

- Connect the headphone to the **HEADPHONES** socket.



- You can select the audio source here: Headphone.
- Control the volume by turning the **VOLUME** control next to the **HEADPHONES** socket.

✓ You can now listen to the selected audio source.

Meaning of the LED

The LED on the front of the Base Station indicates the following information.

The LED is off:

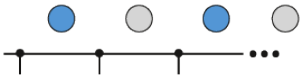
- Base Station is in standby.

The LED is green:

- Base Station is on and one or both RF channels are active.

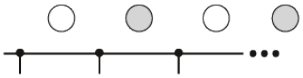
The LED is yellow:

- One or both RF channels are muted.



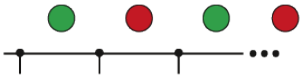
The LED is flashing blue:

- Paring is enabled.



The LED is flashing white:

- The Base Station is identified.

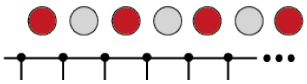


The LED is flashing green and red:

- Firmware update is in progress.

The LED is red:

- Base Station is working, but shows a warning on the display.



The LED is flashing red quickly:

- Error. Base Station is not working and shows a warning on the display.

Information on the display

Basic information are shown on the display.

The display goes into screen saver after some time.

You can wake up the display by pressing or turning the jog-dial.

The display shows the operating menu, which can be used to configure a few settings (see Menu structure).

> **i** More options and other parameters are available in LinkDesk and Spectera WebUI!

To navigate the menu, see Navigating the menu.

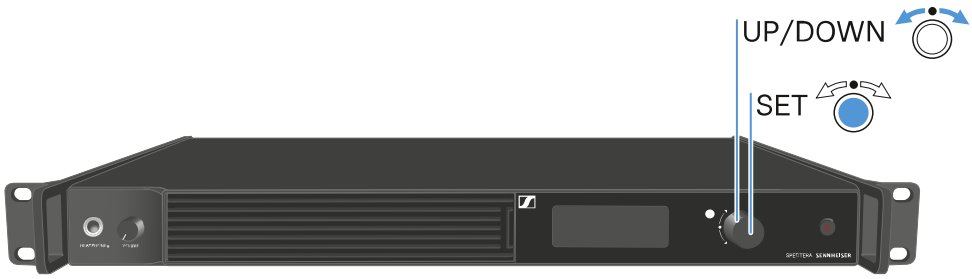
Status messages

In certain situations, status messages may appear on the display.

	**Error** - The temperature is critical. The audio processing stopped. Cool down the Base Station.
	**Warning** - The temperature is high. Check the ventilation to avoid audio interruption.
	**Warning** - The temperature is low. The Base Station is heating up. Please stand by.

Navigating the menu

Use the jog-dial to navigate through the operating menu.



Press the jog dial

- Calls up a menu item
- Changes to a submenu
- Saves settings

Turn the jog dial

- Changes to the previous or next menu item
- Changes the setting of a menu item

Menu structure

In the Base Station menu, you can configure a few settings.

> i More options and other parameters are available in LinkDesk and Spectera WebUI!

The following settings can be changed:

Mute/Unmute the RF-Channels

- Main menu

Change the IP mode

- Network

Select the audio source for the headphone

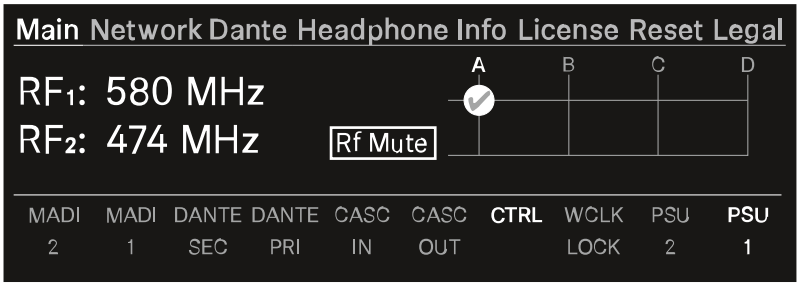
- Headphone

Reset the Base Station

- Reset

Main menu

In this menu item, you can view information about connections.



In the upper part you can view information about the RF channel:

- The selected frequency
- The state of the antenna (mute, active)
- Which antenna port is used for the RF channel.

In the lower part you can view information about the used connection:

- Connected ports are highlighted.
- The order corresponds to the ports on the back.

To mute/unmute the RF channel:

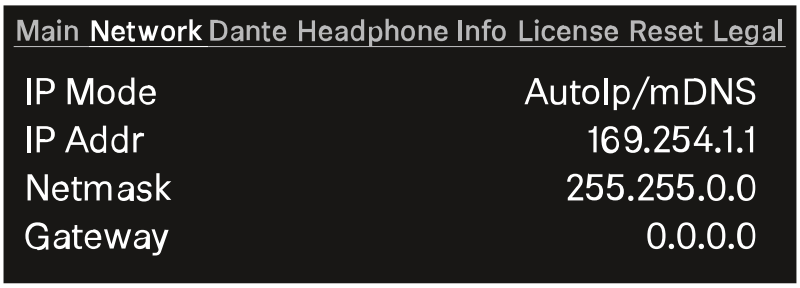
- Press the jog-dial.
  - The RF Status menu opens.

- Rotate and press the jog-dial to change the settings.
  You can select between Rf on and Rf Mute.
- Confirm by selecting Save or discard the changes by selecting Back.

✓ The RF Channels have been muted/unmuted.

Network

In this menu item, you can configure the settings for the network connection.



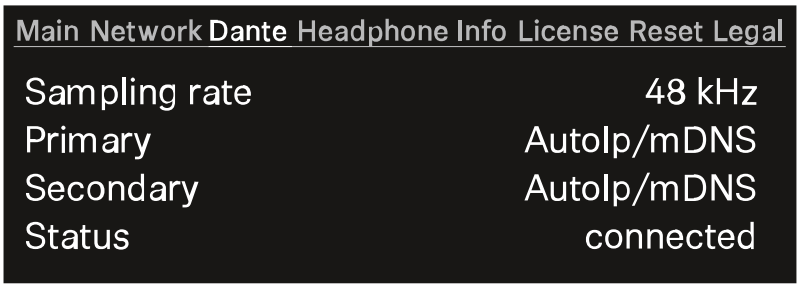
You can make the following settings here:

IP Mode

- Manual
    - You can change the IP Address, the Netmask and the Gateway.
- Manual/mDNS
    - You can change the IP Address, the Netmask and the Gateway.
- AutoIp
    - You can **not** change the IP Address, the Netmask and the Gateway.
- AutoIp/mDNS
    - You can **not** change the IP Address, the Netmask and the Gateway.

Dante

In this menu item, you can view information about the two Dante® connections.



The following information are displayed:

- Sampling rate
- IP mode for Primary
- IP mode for Secondary
- Status

To display a Dante® connection:

- ▶ Press the jog-dial to change the Dante® connection.
- ▶ Rotate the jog-dial to change between Primary and Secondary.

- ▶ Press the jog-dial to enter the setting.

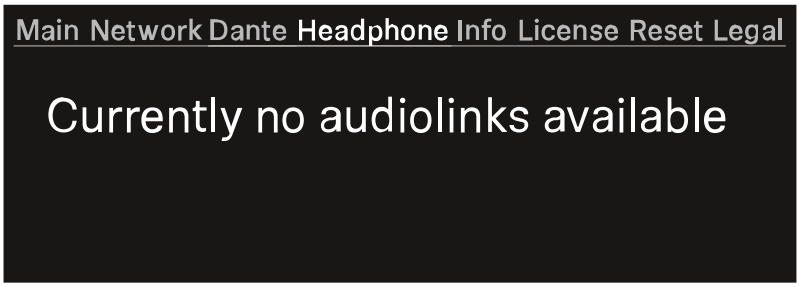
✓ The selected Dante® connection is displayed.

Headphone

In this menu item, you can select the headphone output.

You have to set up audio links via LinkDesk or Spectera WebUI for the mobile devices.

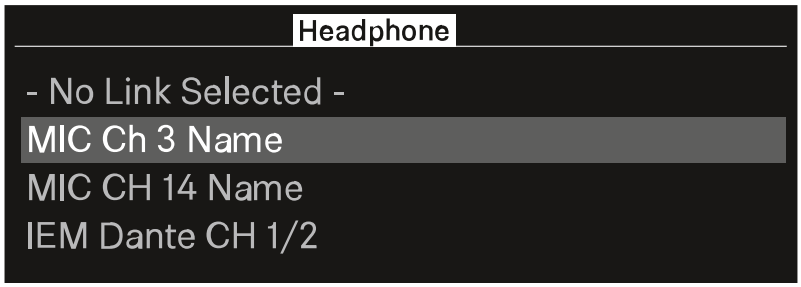
If no audio link is set this note will appear:



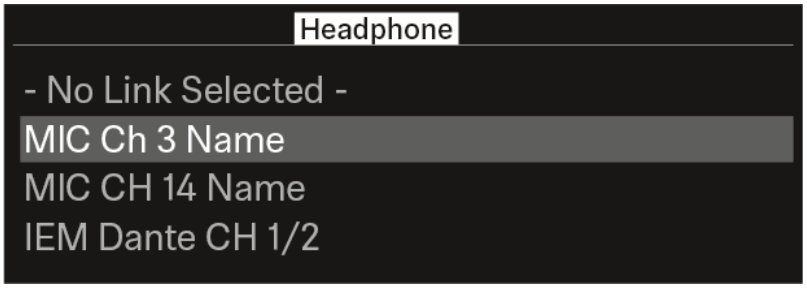
> **i** First you have to set up audio links in LinkDesk or Spectera WebUI.

To select an audio link:

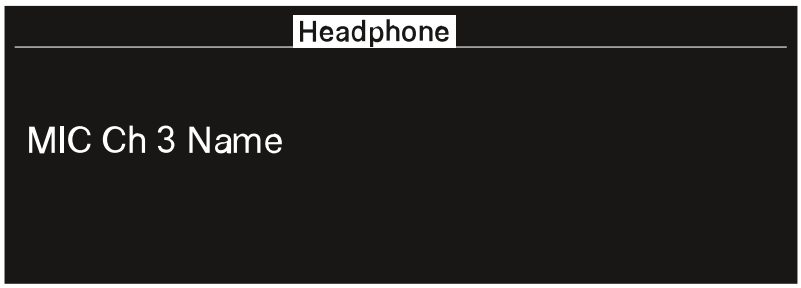
- Press the jog-dial to enter the headphone menu.
  Each audio output will be shown independent.
  - The created audio links appear.



- Turn the jog-dial to select the wanted audio link.
  - The name of the selected link pulses two times.



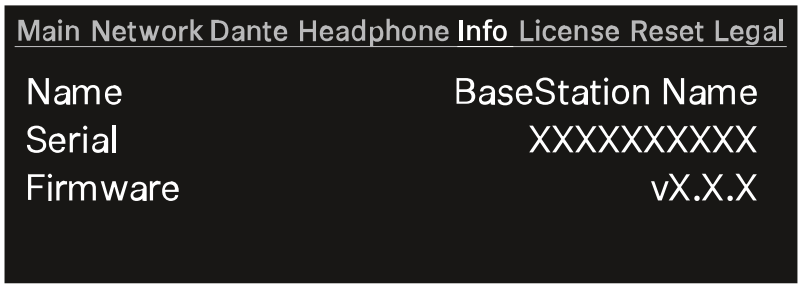
- Press the jog-dial to return to the main menu.
  - The selected link appears.



You can now listen to the selected audio link.

Info

In this menu item, general information can be shown here.



Name: The name of the Base Station.

Serial: The serial number of the Base Station.

Firmware: The installed firmware version.

License

In this menu item, information about the license can be shown here.

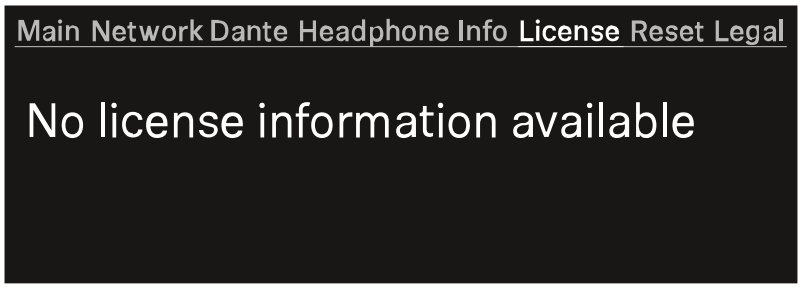
> **i** A license has to be activated, otherwise you cannot use the Base Station.

You can activate a license via LinkDesk or Spectera WebUI.

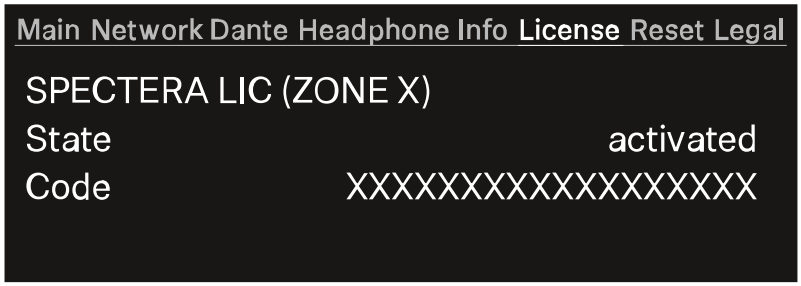
Only one license per Base Station is possible.

The license specifies the country-specific frequency ranges and the RF power.

No license is activated:



A license is activated



Name of the purchased license:

- Spectera LIC (ZONE 01)
- ...
- Spectera LIC (ZONE XX)

State: Status of the license.

- activated
- unknown

Code:

- The activated license number has 18 digits.
- n/a

Reset

In this menu item, you can reset the Base Station to its factory settings.

NOTICE

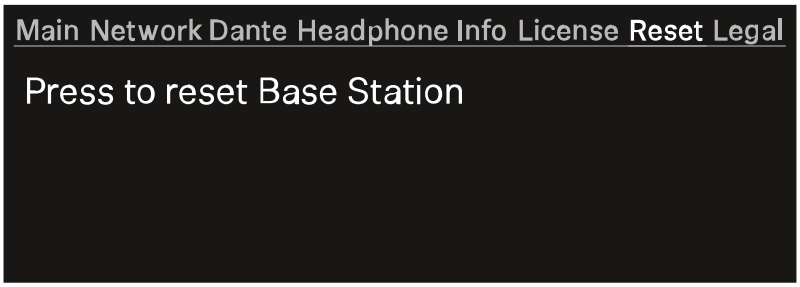
Data loss during the factory reset

All audio devices will be unpaired and all audio routes will be deleted.

All settings (including the device password) are reset to the default values. The license remains activated.

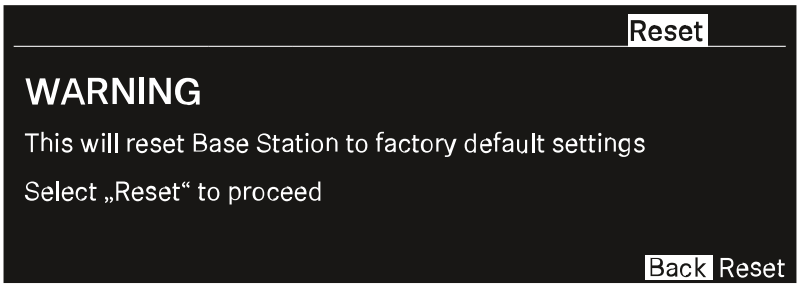
After the reset, the device is restarted automatically.

- Do not reset the Base Station during an active live audio transmission.



To reset the Base Station to factory default settings:

- On the Base Station, rotate the jog-dial and navigate to the menu **Reset**.
- Press the jog-dial to enter the menu.
  - ✓ A warning will appear.



- Rotate the jog-dial to **Reset**.

- Press the jog-dial again.
  - The Base Station will be set back to factory settings and reboot.

    i After rebooting, check the IP address as it may have changed.

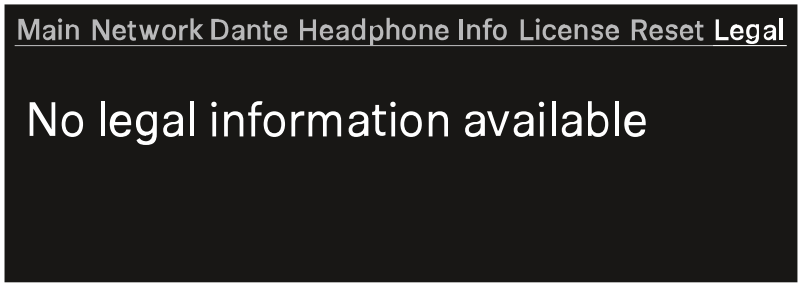
✓ The Base Station has been reset to its factory default settings.

Legal

In this menu item, legal information can be shown.

Legal information about the Base Station and connected antennas are displayed depending on the activated license.

If no label are available, the display shows:



Updating the Base Station

You can update the firmware of the Base Station via LinkDesk or Spectera WebUI.

All Spectera devices must use the same firmware. The Base Station determines the firmware version.

Please note that firmware versions are not backward compatible.

NOTICE

Data loss during firmware update

The audio transmission is interrupted during the firmware update of the Base Station, the antenna or the mobile device.

After the firmware update, the device is restarted automatically.

- Do not update the firmware during an active live audio transmission.

To update the firmware:

- If you want to update the Base Station via LinkDesk, follow the steps described here: Updating the firmware (Base Station).
  - The LED is flashing green and red during the update.
- If you want to update the Base Station via Spectera WebUI, follow the steps described here: Updating the firmware (Base Station).
  - The LED is flashing green and red during the update.

    When the update is installed, the Base Station restarts.

    The update will be installed on the connected antennas automatically.

✓ The firmware has been updated.

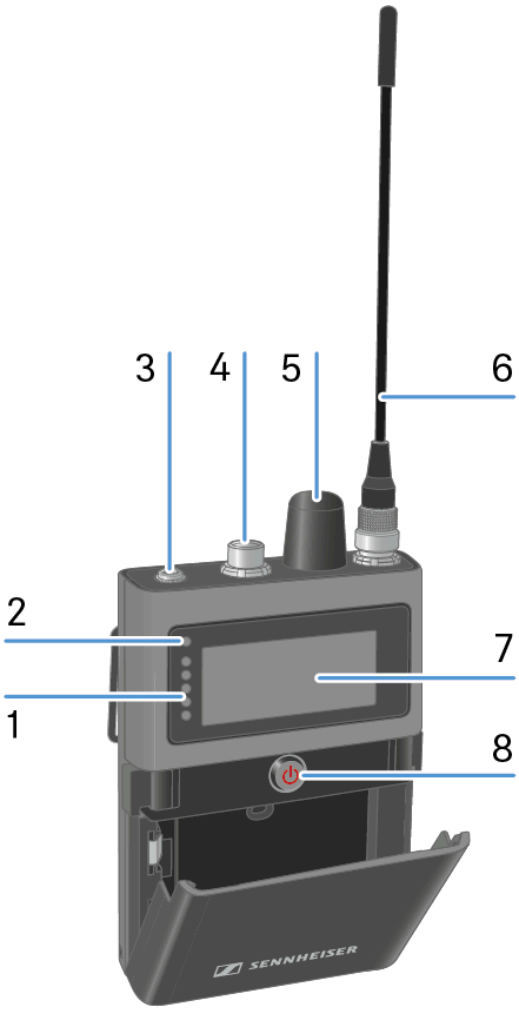
The new firmware is distributed to the other devices via the Base Station.

Updating the SEK
Updating the DAD

SEK

Product overview
Inserting and removing the rechargeable battery
Mounting the antenna
Using the protection cap
Connecting a microphone / instrument
Connecting earphones
Changing the belt clip
Meaning of the LEDs
Switching the SEK on and off
Information on the display
Pairing the SEK to the Base Station
Updating the SEK

Product overview



1 LEDs

- see Meaning of the LEDs

2 Status LED

- see Meaning of the LEDs

3 Phones 3.5 mm jack

- see Connecting earphones

4 Microphone / Instrument input

- see Connecting a microphone / instrument

5 Rotary encoder

- with push function
- see Information on the display

6 Antenna

- see Mounting the antenna

7 Display

- see Information on the display

8 ON/OFF Button

- see Switching the SEK on and off

Inserting and removing the rechargeable battery

The SEK operates only with the recharable battery BA 70 (seperate accessory).

> **i** The BA 70 can be charged in the L 70 USB, the L 6000 with LM 6070 or with the SEK in the CHG 70N-C. See Charging the rechargeable battery, Charging the rechargeable batteries in the L 6000 charger and Charging the rechargeable battery.

To insert the recharable battery into the SEK:

- Press the two catches and open the battery compartment cover.

- Insert the BA 70 rechargeable battery in the battery compartment.

- Close the battery compartment.

The cover locks into place with an audible click.

The battery has been inserted.

Mounting the antenna

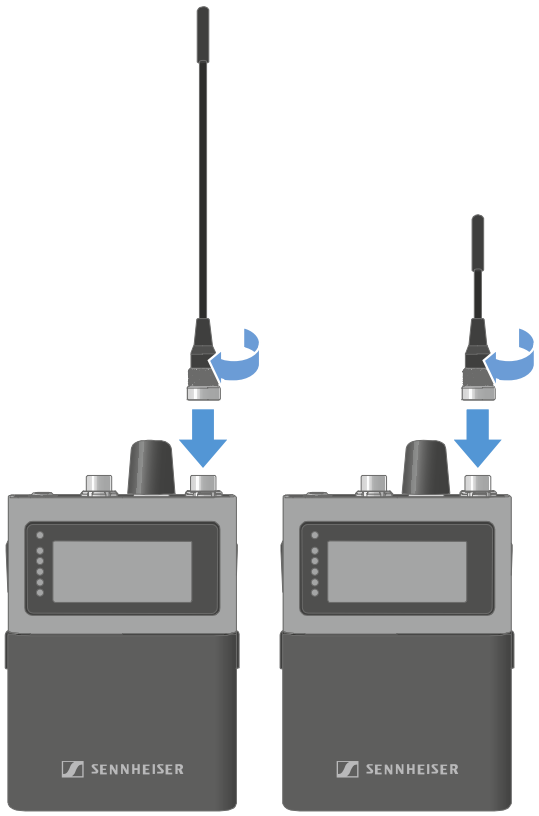
Two antennas are available, one for each frequency range.

For more information see Spectera SEK Antenna.

The antenna is screwed on when it is delivered.

To mount the antenna to the SEK:

- Connect the antenna to the SEK antenna socket.
- Tightly screw the antenna coupling ring onto the SEK antenna socket.



SEK UHF SEK 1G4

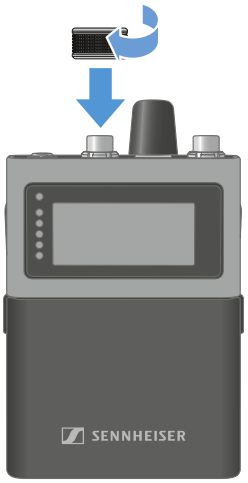
✓ The antenna has been mounted.

Using the protection cap

The cap protects the microphone / instrument input, when not in use.

To screw the cap on the SEK:

- Screw the cap on the microphone / instrument input socket.



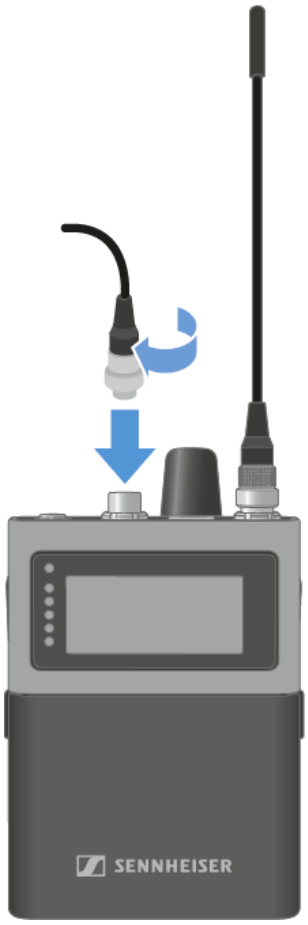
✓ The cap has been attached.

Connecting a microphone / instrument

You can connect a microphone or instrument to the SEK.

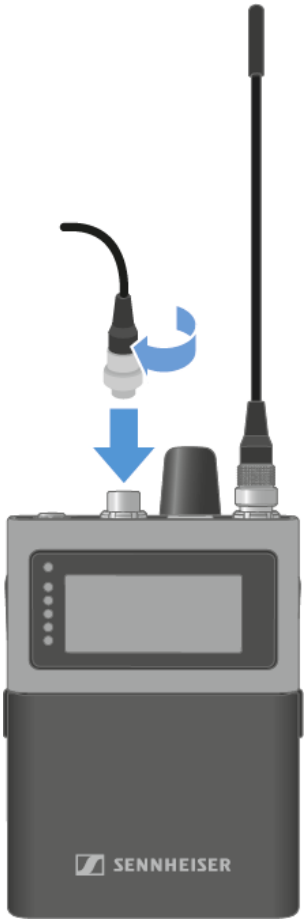
To connect a microphone to the SEK:

- Use a 3-pin audio connector to connect the microphone cable to the SEK microphone / instrument input socket.
- Screw the plug's coupling ring onto the microphone / instrument input thread of the SEK.



To connect a instrument to the SEK:

- Use a 3-pin audio connector to connect the instrument cable to the SEK microphone / instrument input socket.
- Screw the plug's coupling ring onto the microphone / instrument input thread of the SEK.



✓ A microphone or instrument has been connected.

Connecting earphones

ℹ You have to set up an audio link in LinkDesk or Spectera WebUI.

CAUTION

Danger due to high volume levels

Volume levels that are too high may damage your hearing.

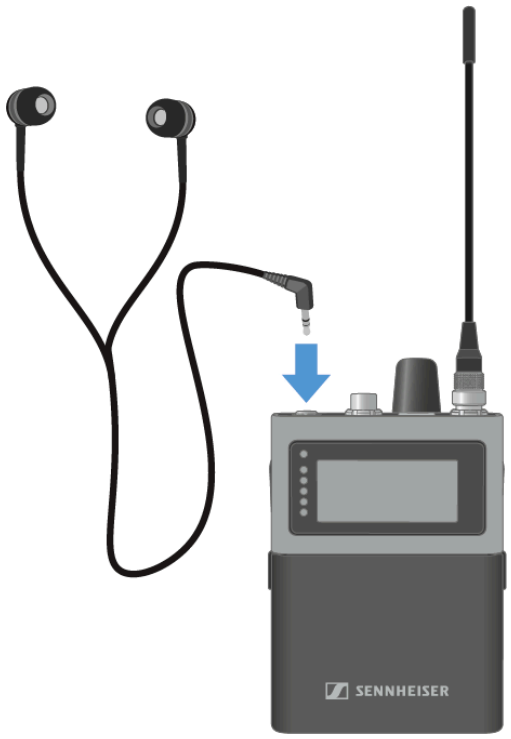
- Turn down the volume of the headphone output before you put on the headphone.

To connect earphones to the SEK:

- Turn down the volume.

  ℹ The volume can be altered between -100 dB to +27.5 dB in steps of 0.5 dB.

- Insert the cable's 3.5 mm jack plug into the phones socket on the SEK.



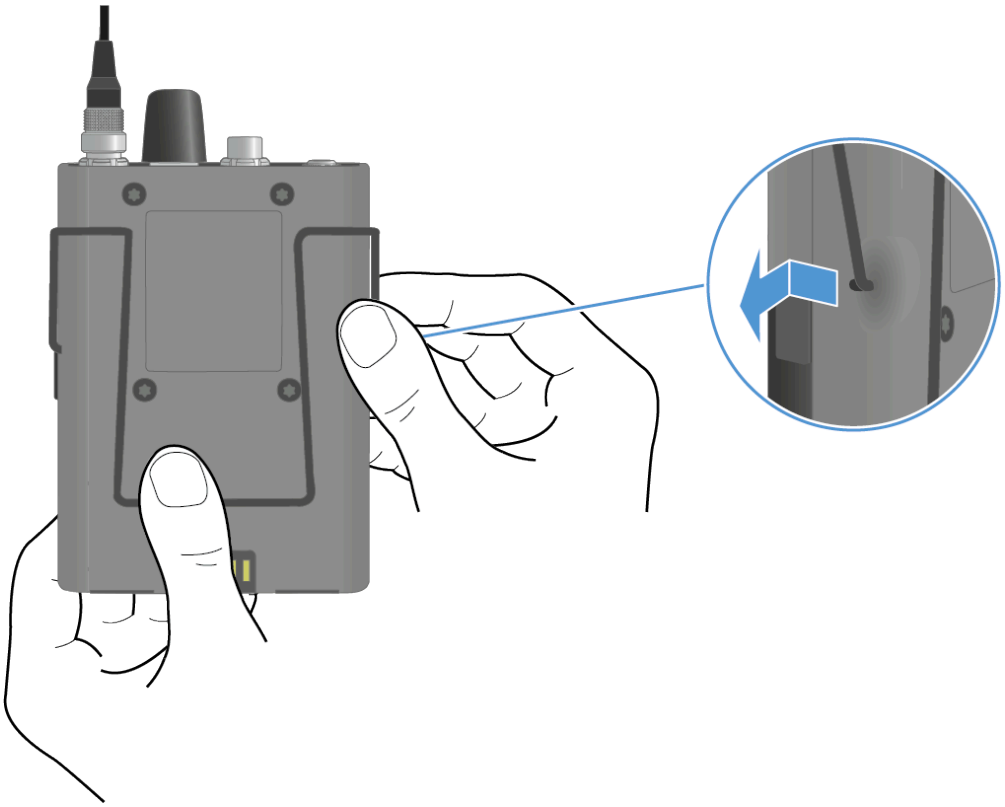
✓ The earphones have been connected.

Changing the belt clip

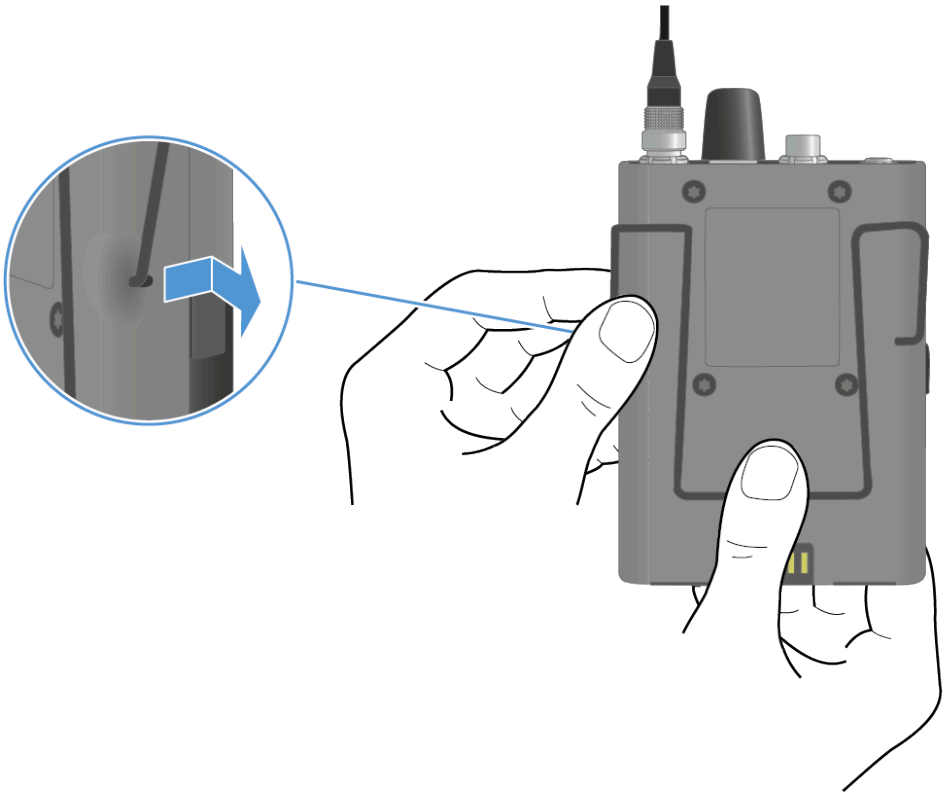
You can change the belt clip on the SEK or flip it over depending on how you want to wear it.

To remove the belt clip:

- Hold down the belt clip with the thump to the housing.
- Use the other hand to carefully pull back and then out one side of the belt clip.



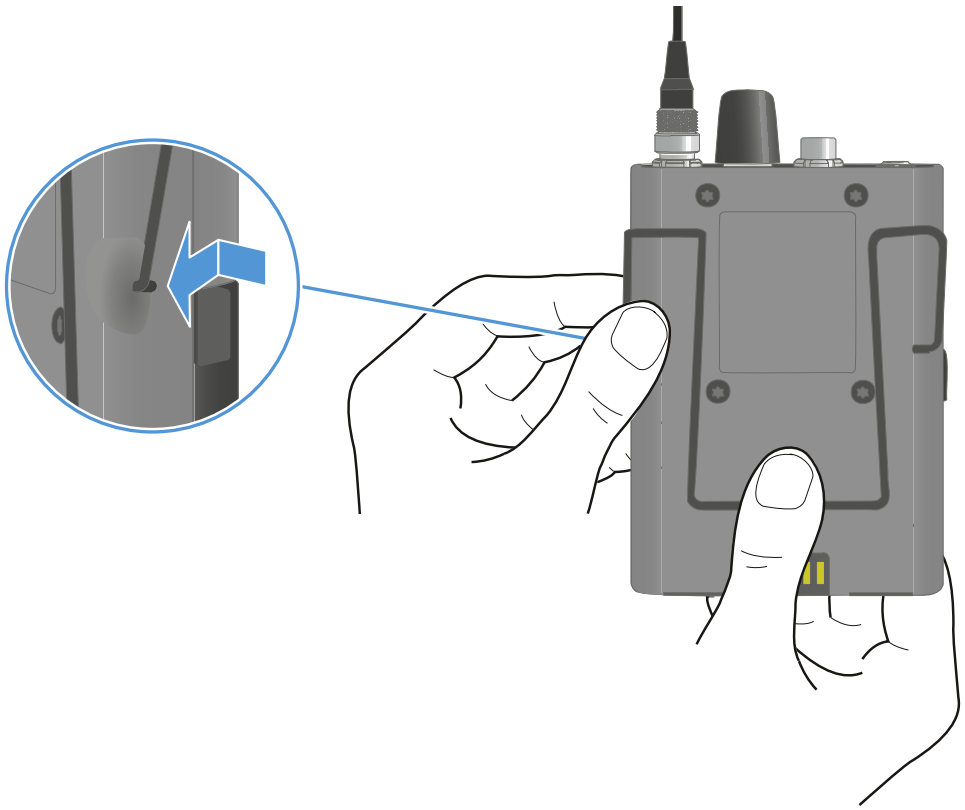
- While still holding the belt clip down, carefully pull back and then out the other side of the belt clip.



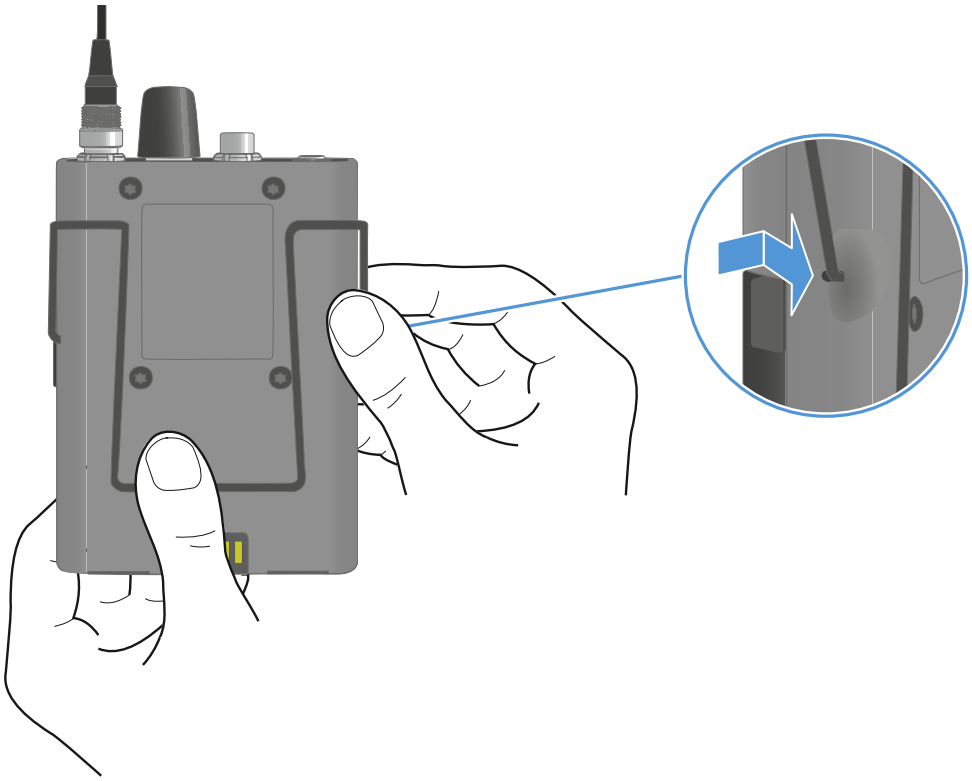
To insert the belt clip:

> Always insert one side before the other, not at the same time, as otherwise the belt clip could bend.

- Hold down the belt clip with the thump to the housing.
- Insert one side of the belt clip first.



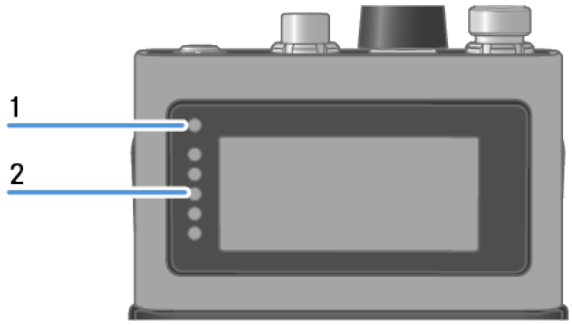
- Then insert the second side of the belt clip.



✓ The beld clip has been removed and inserted.

Meaning of the LEDs

The **Status LED** and **LEDs** can indicate the following information.

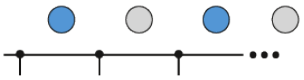
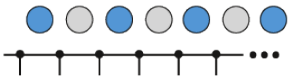
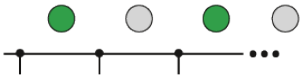


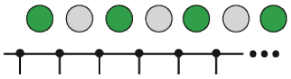
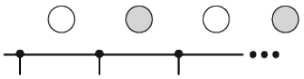
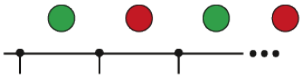
1 Status LED

2 LEDs

Status LED

The **Status LED** provides information about the status between the SEK and Base Station, as well as status information for the SEK.

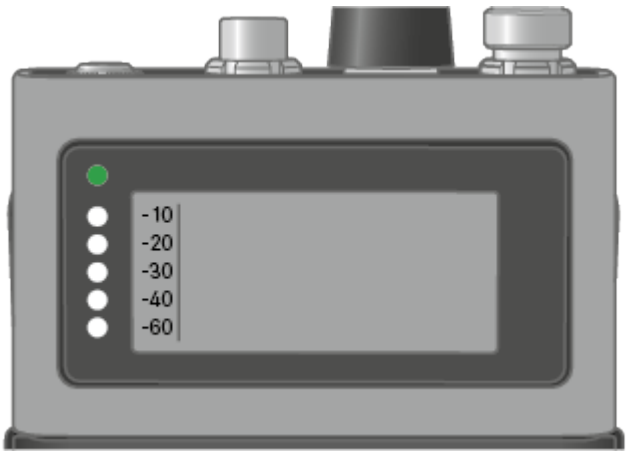
	The LED is off: • SEK is switched off
	The LED is orange: • SEK is starting
	The LED is flashing blue: • Searching for a new Base Station to pair
	The LED is flashing blue quickly: • Pairing to new Base Station is in progress • SEK turns off after five minutes, when no Base Station was found
	The LED is blue: • Connected to new Base Station, waiting for confirmation
	The LED is flashing green: • SEK is searching for previously paired Base Station

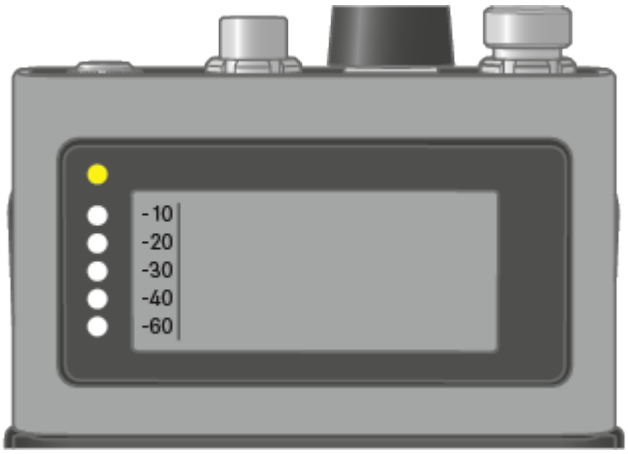
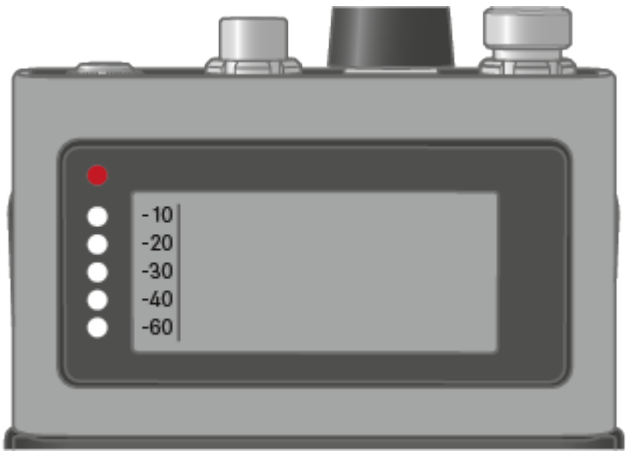
	The LED is flashing green quickly: • SEK is connecting to previous paired Base Station
	The LED is green: • SEK is on • SEK is connected to the Base Station
	The LED is flashing white • Identify of SEK is in progress
	The LED is flashing green and red: • Firmware update is in progress

LEDs

The **LEDs** provide information about the mic line input level, if a microphone or instrument is connected to the SEK.

> **i** You have to set up an audio link in LinkDesk or Spectera WebUI.



	above -5 dBFS RMS
	above -1 dBFS PEAK

Switching the SEK on and off

To switch the SEK on:

- Short-press the ON/OFF button.

  - The SEK is starting. The status LED is orange.

To put the SEK in pairing mode:

- When the SEK is off, long press the ON/OFF button.
  - The SEK is searching for a new Base Station to pair. The status LED is flashing blue.

To switch the SEK off:

- Short-press the ON/OFF button.
  - The status LED goes off.

> **i** The display will stay on when the device is switched off or the battery has been removed.

✓ The SEK has been switched on/off.

When the SEK is unpaired via the software (LinkDesk or Spectera WebUI), the SEK will automatically switch into pairing mode. The status LED is flashing blue.

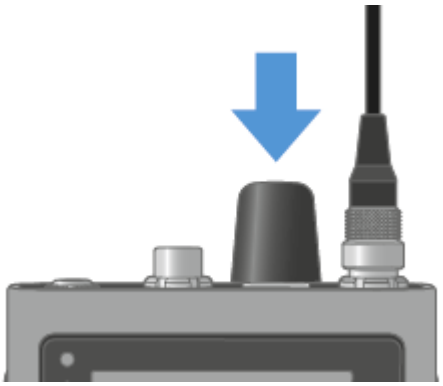
Information on the display

You can view the following information on the SEKs display.

> The display will stay on when the device is switched off or the battery has been removed.

The order of the displayed information changes depending on the setting.

- Press the rotary encoder to navigate through the menu.



To turn on the backlight:

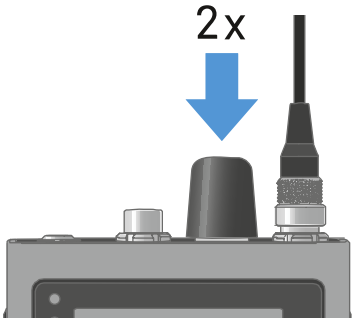
> No microphone or headphone is connected.

- Press the rotary encoder.
  - The backlight is on for five seconds.

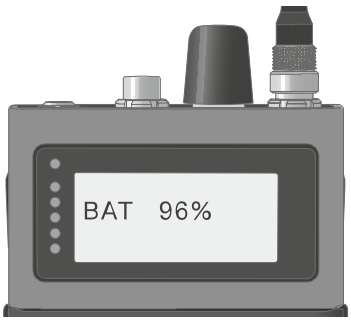
To check the battery status:

> No audio link is set.

- Press the rotary encoder for two times.



  - The battery status displays for five seconds.



To display the headphone volume:

> Only available if in-ear audio link mode is activated.

- Press the rotary encoder.
  - The backlight is on for five seconds.
- Press the rotary encoder again within 5 seconds after the first press.

✓ The headphone volume displays for five seconds.

> **i** The volume can be altered between -100 dB to +27.5 dB in steps of 0.5 dB.

- ▶ Turn the rotary encoder slowly to change the volume.
  - ✓ The volume changes by 0.5 dB per click.
- ▶ Turn the rotary encoder quick to change the volume.
  - ✓ The volume changes dynamically in larger increments.

To display the mic/line level:

> **i** Only available if mic audio link is activated.

- ▶ Press the rotary encoder.
  - ✓ The backlight is on for five seconds.
- ▶ Press the rotary encoder again within 5 seconds after the first press.
  - ✓ The mic/line level is displayed. The five LEDs show the input level.

To display the E-label:

> **i** The SEK is paired to the Base Station and the activated license uses E-labels.

- ▶ Press the rotary encoder.
  - ✓ The backlight is on for five seconds.
- ▶ Press the rotary encoder till the end of the menu.
- ▶ Press the rotary encoder long for E-label screen.
  - ✓ The first page of the E-label displays.
- ▶ Press the rotary encoder again to display subsequent E-labels.

- Press the rotary encoder long to return to the information screen.
- Press the rotary encoder for two seconds to leave the E-label menu.

Pairing the SEK to the Base Station

> **i** Mobile devices can only be paired and operated with one Base Station at a time.

You can pair up to 128 mobile devices to a Base Station within one RF channel.

Please make sure that on the Base Station

- a RF channel is configured and
- this RF channel is activated (RF on).

To pair the SEK to a Base Station:

- Put the Base Station into **Pairing Mode** using LinkDesk or Spectera WebUI.
  - ✓ The LED flashes blue.

    > **i** Pairing Mode is activated for five minutes. The audio signal is not interrupted.

- While the SEK is off, long-press the ON/OFF button until the Status LED is blue.
  - ✓ The status LED is flashing blue while searching for a new Base Station.

    When the SEK found the Base Station, the status LED is flashing blue quickly and then is blue.

    The SEK appears in the software.
- Confirm the pairing in the software, see LinkDesk: **Adding mobile devices** and Spectera WebUI: **Pairing/unpairing mobile devices**.
  - ✓ The status LED of the SEK is flashing green quickly while connecting. When connecting is completed, the status LED is green.

To unpair the SEK from a Base Station:

- The SEK can only be unpaired in LinkDesk or Spectera WebUI.
  - LinkDesk: **Pairing/unpairing mobile devices**
  - Spectera WebUI: **Pairing/unpairing mobile devices**
  - ✓ The SEK will automatically switch to pairing mode. The status LED is flashing blue.

✓ The SEK has been paired to a Base Station.

Updating the SEK

You can update the firmware of the SEK via LinkDesk or Spectera WebUI.

All Spectera devices must use the same firmware version. The Base Station determines the firmware version.

NOTICE

Data loss during firmware update

The audio transmission is interrupted during the firmware update of the Base Station, the antenna or the mobile device.

After the firmware update, the device is restarted automatically.

- Do not update the firmware during an active live audio transmission.

To update the firmware:

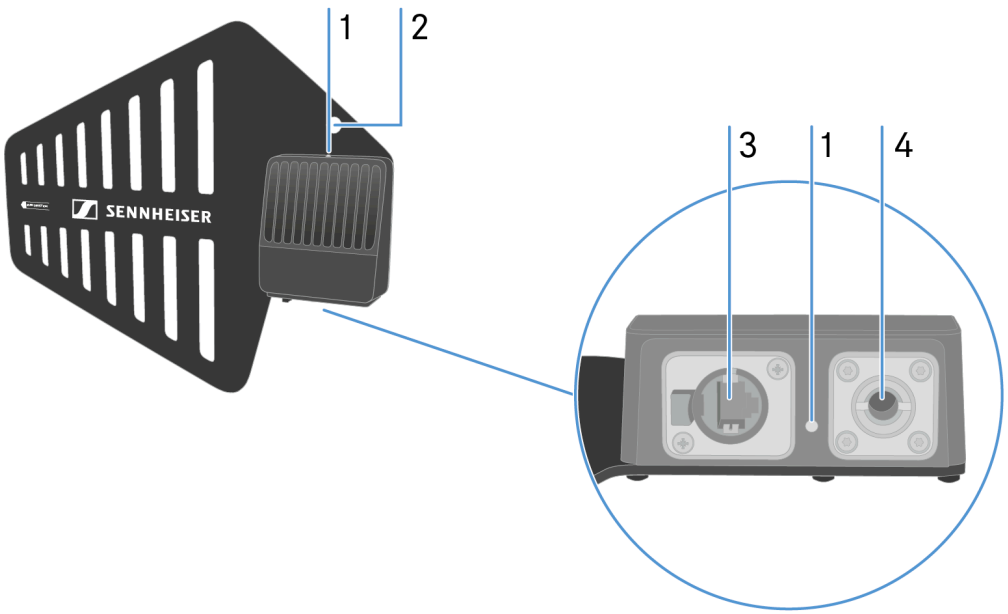
- If you want to update the SEK via LinkDesk: Updating the firmware (mobile devices).
  - The Status LED is flashing green and red during the update.
- If you want to update the SEK via Spectera WebUI: Updating the firmware (mobile devices).
  - The Status LED is flashing green and red during the update.

The firmware has been updated.

DAD

Product overview
Information on antenna setup
Meaning of the LED
Placing on a stand
Connecting/disconnecting the antenna
Antenna cable extension
Updating the DAD

Product overview



1 LED to indicate the status

- see Meaning of the LED

2 Hole for rigging safety cable

3 Ruggedized RJ45

- see Connecting/disconnecting the antenna

4 Microphone stand

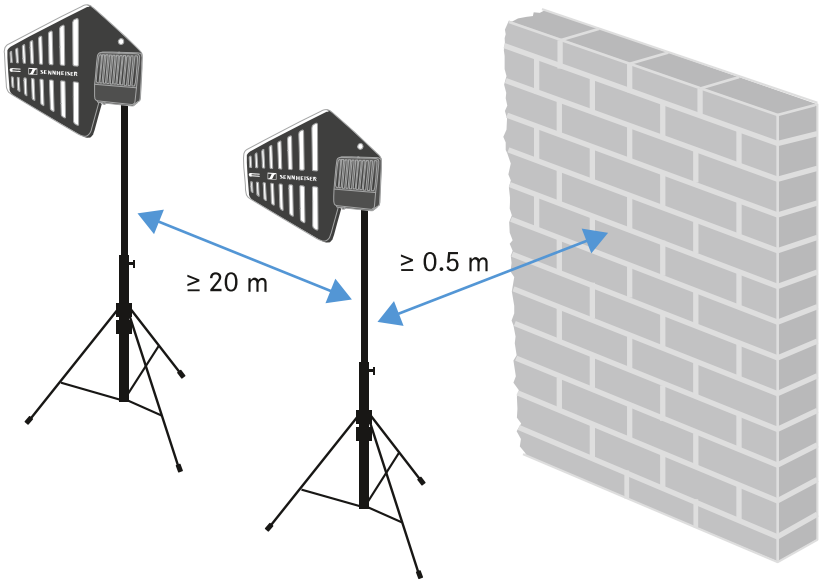
- see Information on antenna setup

Information on antenna setup

> **i** Handle with care: The antenna contains electrical components.

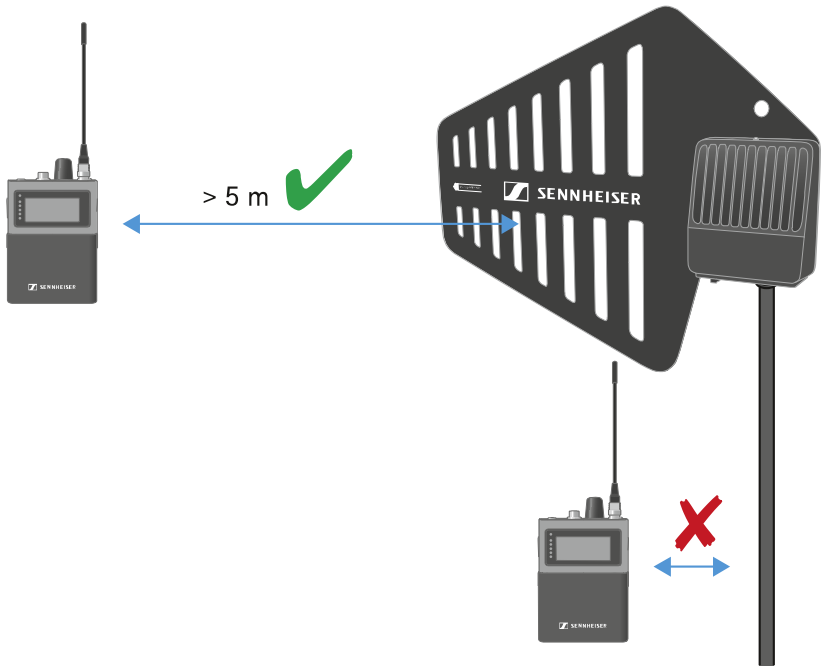
Setup with other antennas

- Keep a distance more than 20 m (787.4") between the antenna and another antenna.
- Keep a distance more than 0.5 m (19.69") between the antenna and a wall.



Setup with a mobile device

- Keep a distance more than 5 m (169.85") between the antenna and the mobile device.



Meaning of the LED

The LED on top and below indicates the same information.

The LED is off:

- The antenna is not connected to the Base Station.

The LED is flashing green:

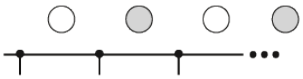
- The antenna is connecting to the Base Station.

The LED is green:

- The antenna is connected to the Base Station and one or both RF channels are active.

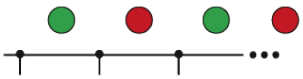
The LED is yellow:

- The antenna is connected to the Base Station and one or both RF channels are muted.



The LED is flashing white:

- The connected antenna is identified.



The LED is flashing green and red:

- Firmware update is in progress.

Placing on a stand

The thread is suitable for mounting on a standard microphone stand with 3/8" or 5/8" thread.

ℹ Handle with care: The antenna contains electrical components.

⚠ CAUTION

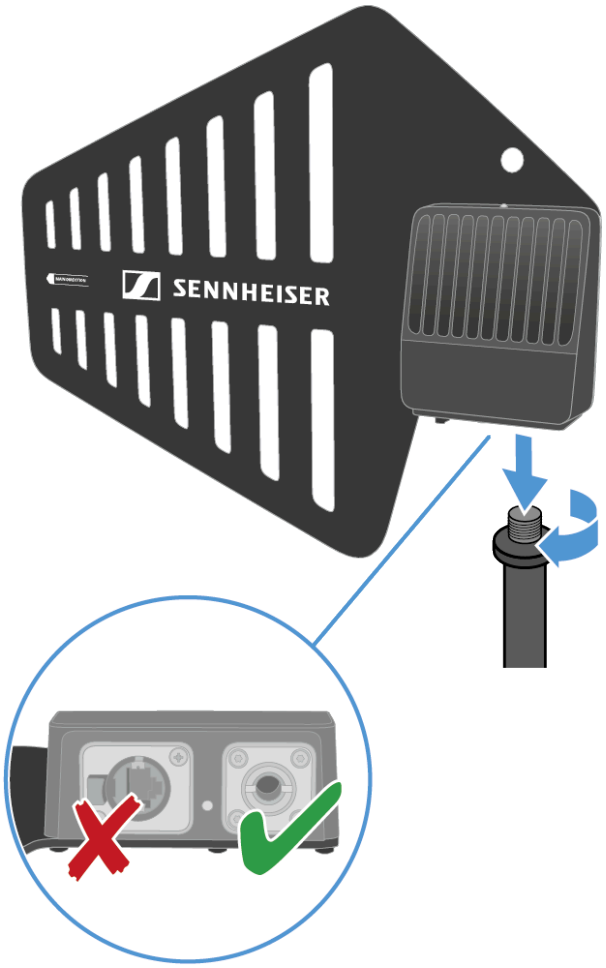
Personal injury and damage to property if the antennae should tip or fall over

If you do not secure the antennae against tipping or falling over, they may cause personal injury and damage to property.

- Secure antennae so that they cannot tip and fall over. Use safety wires for this purpose. The safety wires, rope terminations and coupling links must comply in their dimensioning and condition with the regulations and standards of the country in which they are used!

To place the DAD on a stand:

- Screw the DAD to the stand.
- Make sure to use the correct hole!



✓ The DAD has been placed on a stand.

Connecting/disconnecting the antenna

The cable supplies power and exchanges data.

> **i** Handle with care: The antenna contains electrical components.

The cable must

- be a CAT5e or higher,
- have ruggedized plugs and
- not extend 100 m (3937").

> **i** We recommend using a antenna cable cat 5e (see Accessories for the DAD).

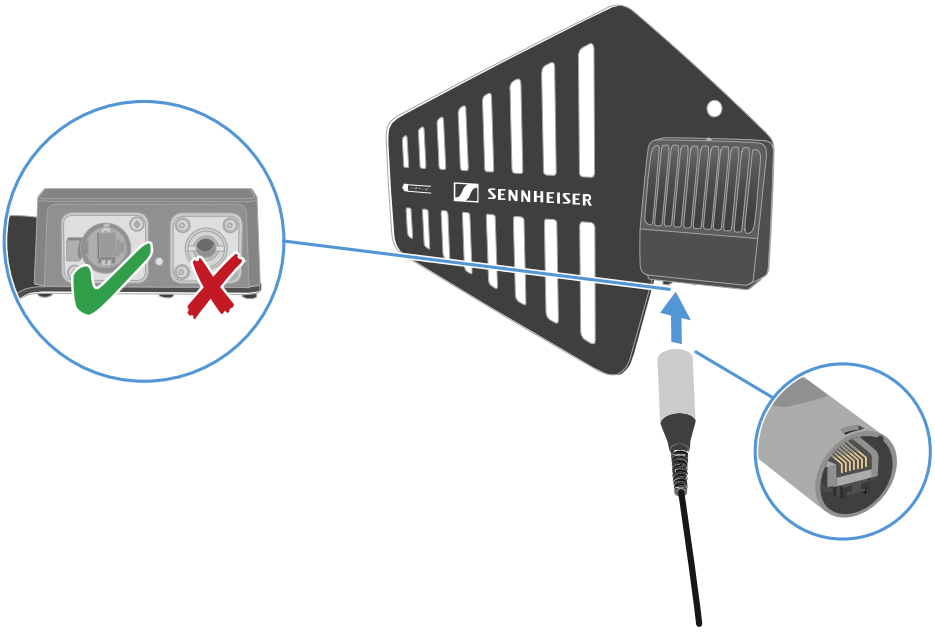
To connect the antenna to the Base Station:

- Observe the information: Information on antenna setup.

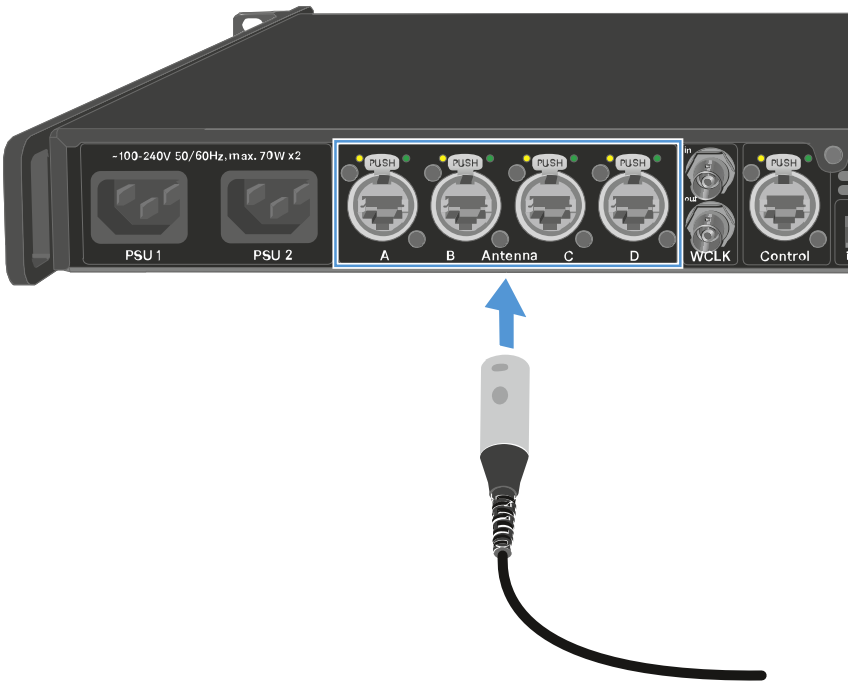
  > **i** The antenna must be connected directly to the Base Station, with no switch in between.

- Plug on side of the cable into the antenna.

- Make sure to use the correct hole!



- Plug the other side of the cable into one antenna port (A, B, C or D) at the rear site of the Base Station.



✓ The LED flashes green to connect to the Base Station.

The LED is green, when the antenna is connected to the Base Station and and one or both RF channels are active.

Or the LED is yellow, when the antenna is connected to the Base Station and the radio signal is muted.

Or the LED is flashing green and red, when the firmware is updating automatically.

> **i** If the Base Station is in standby, the DAD is off.

- You can connect up to four antennas to one Base Station.

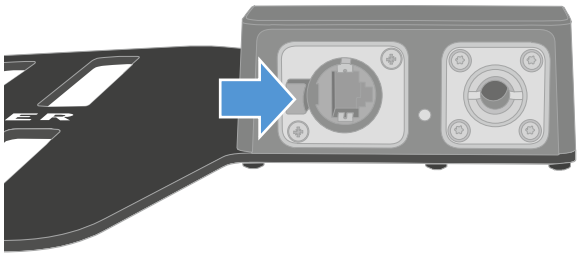
  The Base Station has two independend RF channels. Both variants of the antenna (UHF and 1G4) can be connected to the Base Station at the same time.

To disconnect the antenna from the Base Station:

- Hold the push button down.
- Unplug the cable from the Base Station.

To disconnect the cable from the antenna:

- Hold the snap-in nose down.



- Unplug the cable from the antenna.

✓ The antenna has been connected/disconnected.

Related information

Antenna cable extension

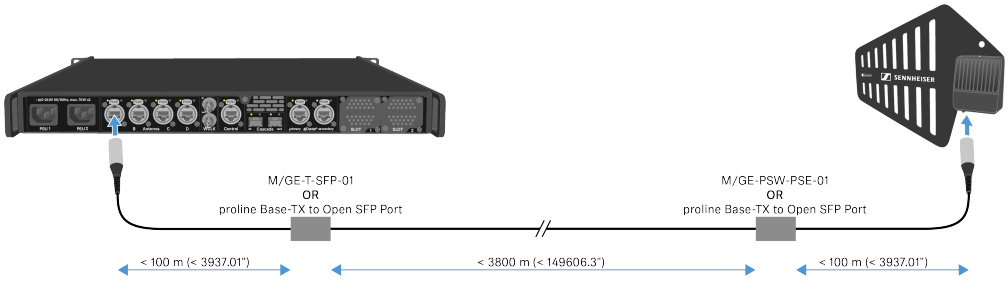
Antenna cable extension

Longer cable distances are possible with the use of fiber optic cables and media converters.

Sennheiser tested the recommend converters for a complete distance of 4 km (157480.31").

We only recommend the following converters for fully tested functionality:

- Converter with PoE for DAD antenna Lantronix M/GE-PSW-PSE-01
- Converter for the Base Station Lantronix M/GE-T-SFP-01
- Converter for DAD antenna or Base Station proline Base-TX to Open SFP Port POE



i The media converter must not have a switch function.

Updating the DAD

The firmware of the antenna will update automatically, when connected to the Base Station.

NOTICE

Data loss during firmware update

The audio transmission is interrupted during the firmware update of the Base Station, the antenna or the mobile device.

After the firmware update, the device is restarted automatically.

- Do not update the firmware during an active live audio transmission.

To update the firmware:

- Connect the antenna to a Base Station. See Connecting/disconnecting the antenna. To update the Base Station, see Updating the Base Station.
  - ✓ The LED is flashing green and red during the update.

✓ The firmware has been updated.

CHG 70N-C charger

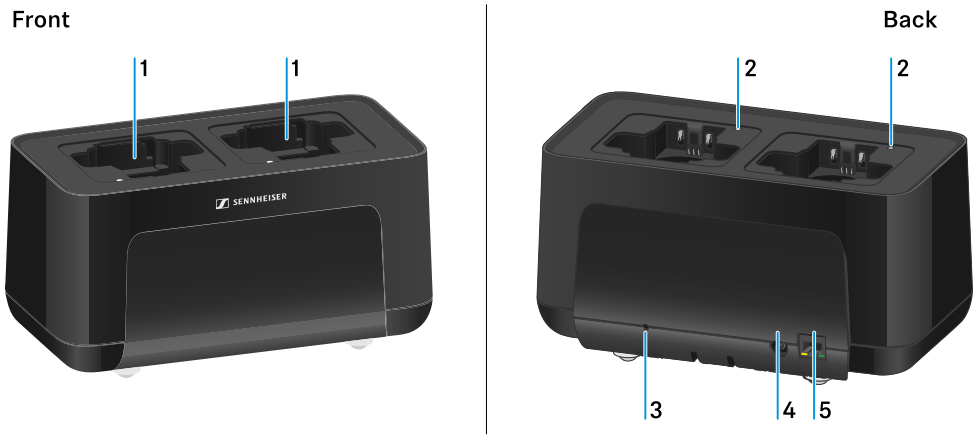
The CHG 70N-C is a network enabled charger featuring two individual charging bays.

Compatible products:

- EW-DX SKM/EW-DX SKM-S handheld transmitter
- EW-DX SK/EW-DX SK 3-PIN bodypack transmitter
- SPECTERA SEK bidirectional transmitter
- BA 70 rechargeable battery

Product overview
Connecting/disconnecting the charger to/from the power supply system
Connecting a charger in a network
Cascading chargers
Charging the rechargeable battery
Power saving mode

Product overview



1 Charging slots

- See Charging the rechargeable battery

2 Status LED of the charging slots

- See Charging the rechargeable battery

3 **Reset** button
- Press and hold for 10 seconds to reset the device's network settings, see Connecting a charger in a network
- Press and hold for 4 seconds to enable power saving mode, see Power saving mode

4 **DC in** connection socket for the **NT 12-35 CS** power supply unit
- See Connecting/disconnecting the charger to/from the power supply system

5 **PoE/Ethernet** RJ45 socket for controlling the device over the network and for Power over Ethernet power supply
- See Connecting a charger in a network
- See Connecting/disconnecting the charger to/from the power supply system

i You can cascade up to 5 devices with only one power supply and one network connection. See Cascading chargers.

Connecting/disconnecting the charger to/from the power supply system

You can operate the charger either with the Sennheiser NT 12-35 CS power supply unit or with Power over Ethernet (PoE IEEE 802.3af Class 0). Please refer to the following information.

Power from the NT 12-35 CS power supply unit

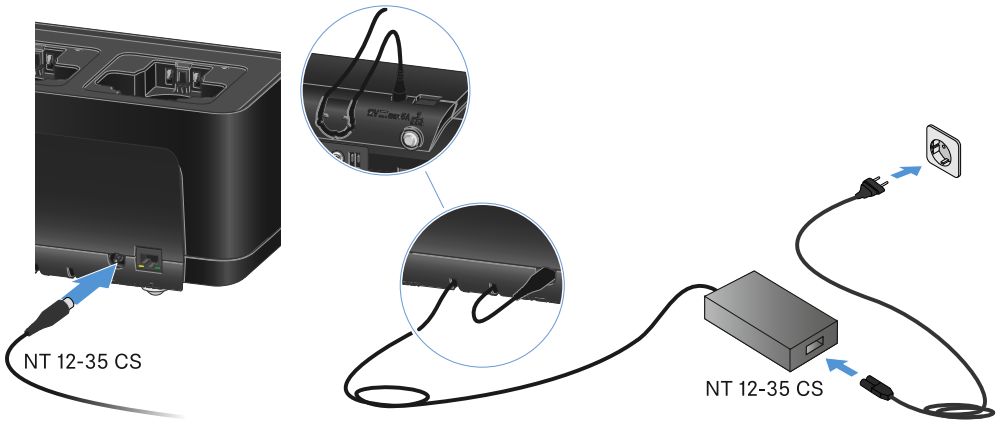
- Use only the **NT 12-35 CS** power supply unit from Sennheiser. It is designed for your charger and ensures safe operation.

> **i** The power supply unit is available either separately (Sennheiser article number 508995) or together with the charger as a kit (see CHG 70N-C network-enabled charger).

Power from the NT 12-35 CS power supply unit

> **i** Use only the **NT 12-35 CS** power supply unit from Sennheiser. It is designed for your charger and ensures safe operation. The power supply unit is available either separately (Sennheiser article number 508995) or together with the charger as a kit (see CHG 70N-C network-enabled charger).

- Connect the hollow jack plug of the power supply unit to the **DC in** socket on the charger.
- Pass the cable through the strain relief.
- Plug the power supply unit into the wall outlet using the correct power cable for your country.



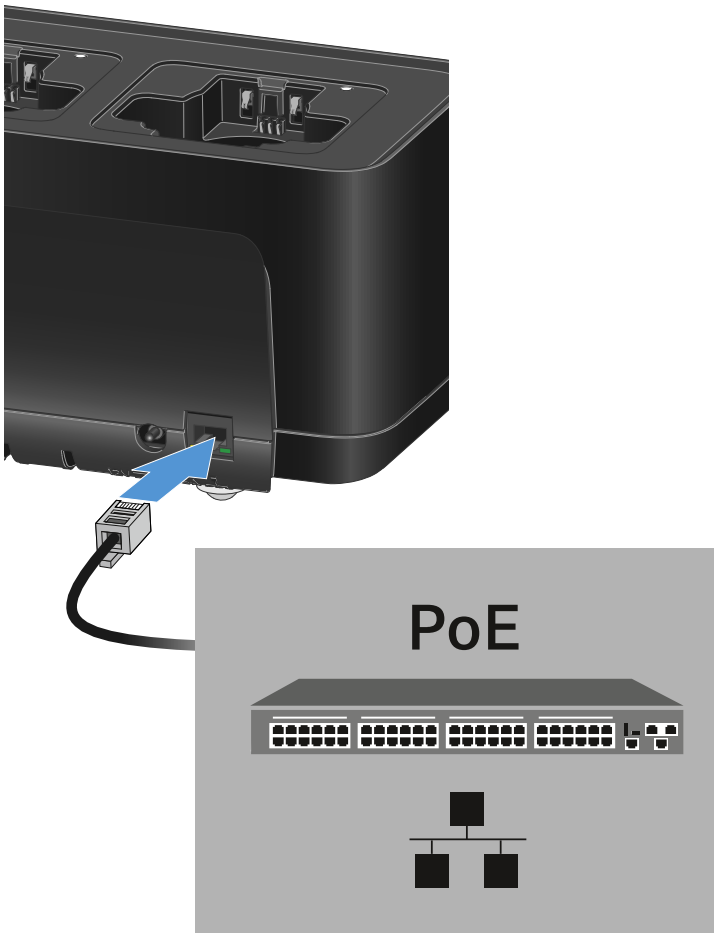
Disconnecting the charger completely from the power supply system

- Unplug the mains cable from the wall socket.
- Unplug the hollow jack plug of the power supply unit from the **DC in** socket on the charger.

Power over Ethernet (PoE)

> The charger can be powered via **Power over Ethernet** (PoE IEEE 802.3af Class 0).

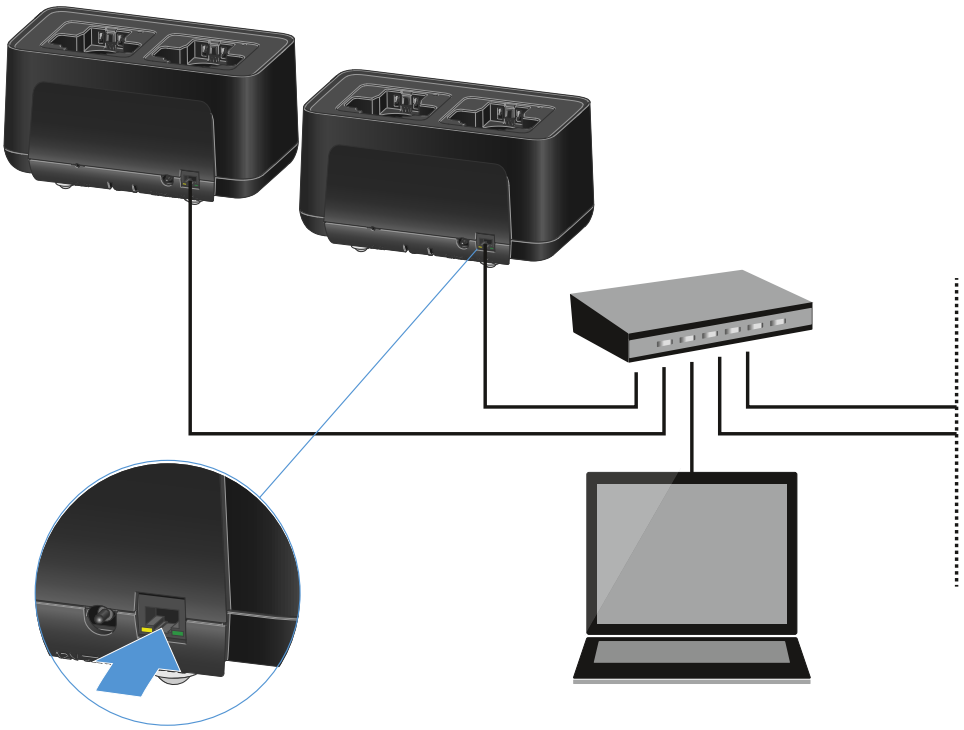
- Connect the charger to a **PoE**-enabled network switch.



Connecting a charger in a network

You can monitor and control one or more chargers via a network connection using the **Sennheiser Wireless Systems Manager (WSM)** or **Sennheiser Control Cockpit (SCC)** software.

> **i** The network does not have to be a homogeneous network including only chargers. You can integrate the charger into your existing network infrastructure with any other types of devices.



You can integrate the devices into the network individually or cascade up to 5 chargers (see Cascading chargers).

To reset the network settings to their factory defaults:

- Hold the **Reset** button for 4 seconds.

For more information about controlling devices via the Sennheiser Wireless Systems Manager or Sennheiser Control Cockpit software, refer to the instruction manual for the software. You can download the software here:

sennheiser.com/wsm

sennheiser.com/scc

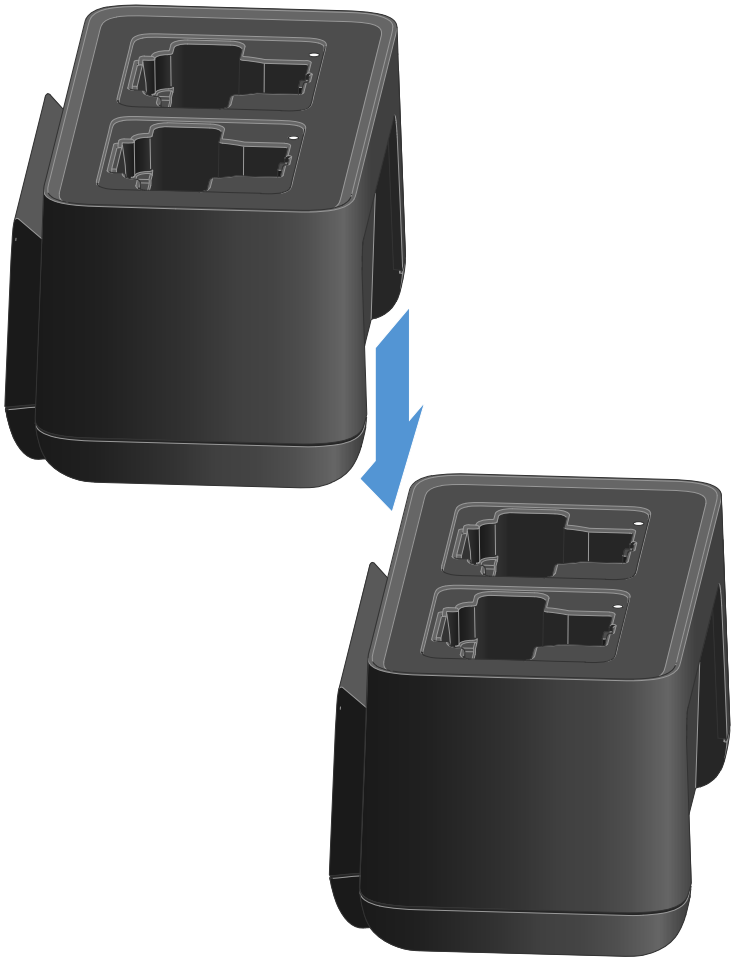
Cascading chargers

You can cascade up to five CHG 70N-C chargers and operate them with a single power supply and a single network connection. This minimizes the cabling required for larger systems.

> **i** The power must be supplied via the NT 12-35 CS power supply unit. Power over Ethernet (PoE) is not possible when cascading.

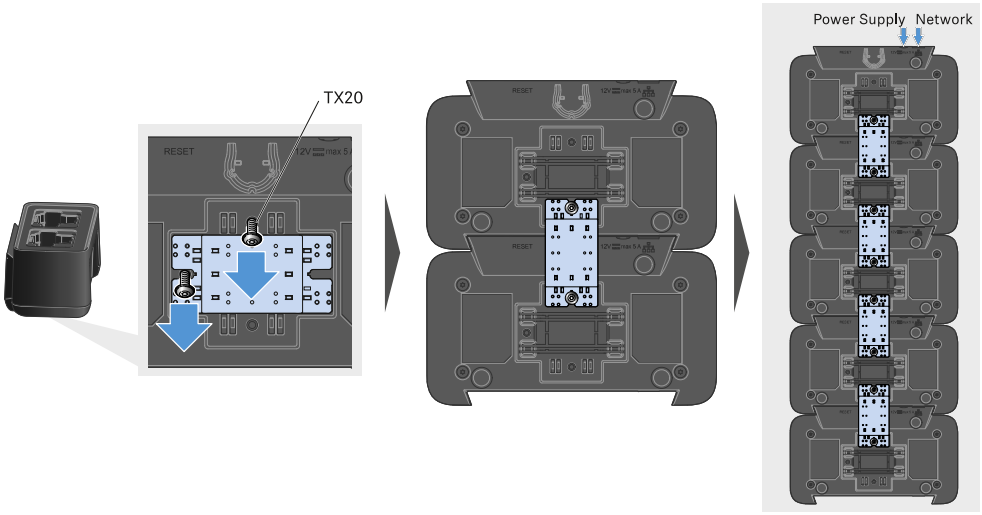
To cascade the chargers:

- Make sure that no chargers are connected to the power before you start.
- Plug the chargers into each other as shown in the figure.

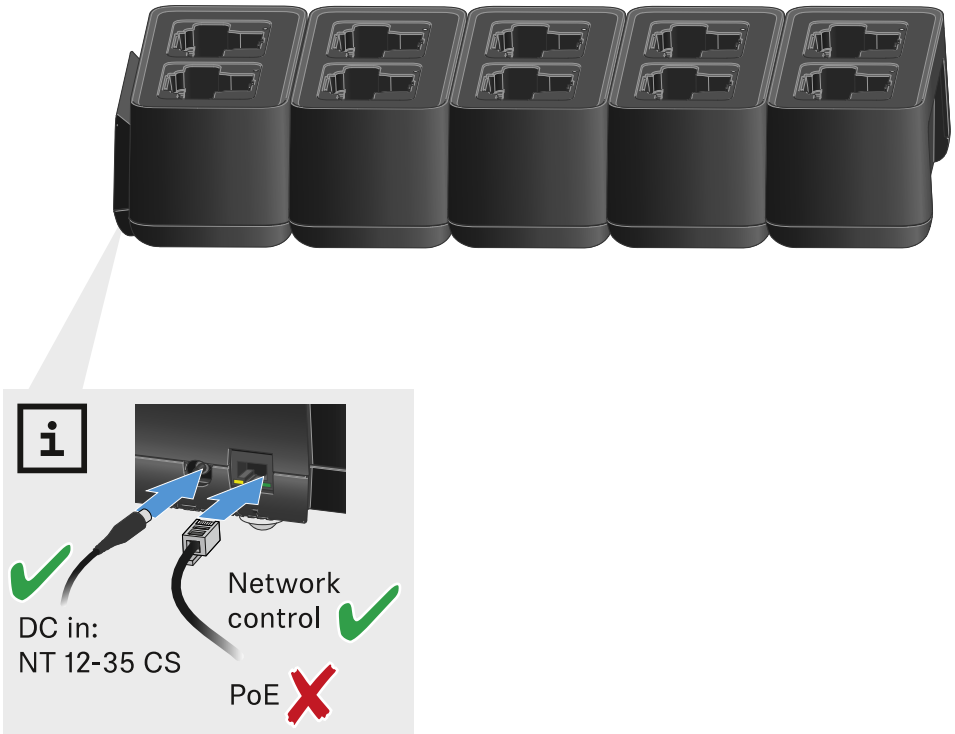


- Detach the connecting rail on the bottom of the charger.
- Fasten the connecting rail beneath two chargers as shown in the figure.

The power and the network connection are passed on to all devices via the connecting rails.



- Connect the first charger in the cascade to the network (see Connecting a charger in a network).
- Finally, connect the NT 12-35 CS power supply unit to the first charger in the cascade (see Connecting/disconnecting the charger to/from the power supply system).

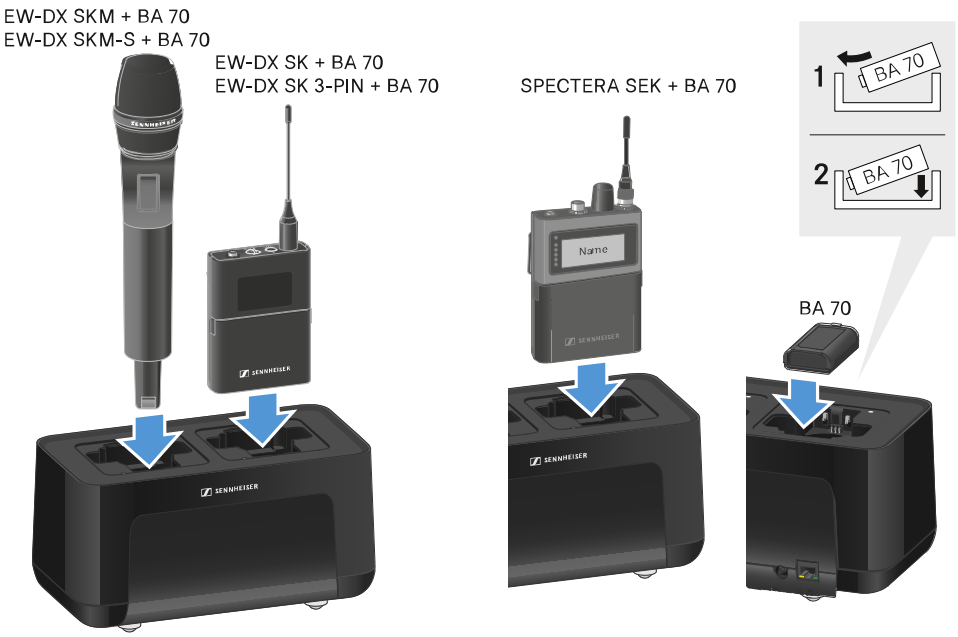


Charging the rechargeable battery

You can use the CHG 70N-C charger to charge individual BA 70 rechargeable batteries, or to charge EW-DX SKM, EW-DX SKM-S, EW-DX SK, EW-DX SK 3-PIN or Spectera SEK with the BA 70 rechargeable battery already inserted.

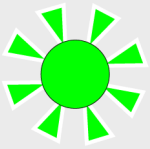
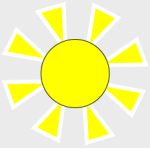
To charge the battery:

- Insert the individual rechargeable battery or the transmitter with battery already inserted into the charging slot as shown in the figure.



The rechargeable battery will begin charging.

The LED on the charging slot shows the battery's charge level.

LEDs	
	100 %
	> 60 %
	> 20 %
	> 0 %
	Error

Power saving mode

In power saving mode, the transmitters are charged only once. The charger also does not provide any trickle charge.

To activate power saving mode:

> **i** In power saving mode, the CHG 70N-C cannot be controlled over the network.

- Remove all transmitters and/or rechargeable batteries from the charging slots.
- Hold the **Reset** button for 4 seconds.
  - The charging slot LEDs light up purple.
- Insert the rechargeable battery/transmitter for charging.
  - The rechargeable battery will begin charging. The charging slot LED turns green once it reaches full charge.

To deactivate power saving mode:

- Disconnect the charger from the power supply system.
- Then reconnect it to the power supply system.
  - The charger will start up in the configuration that was set before you activated power saving mode.

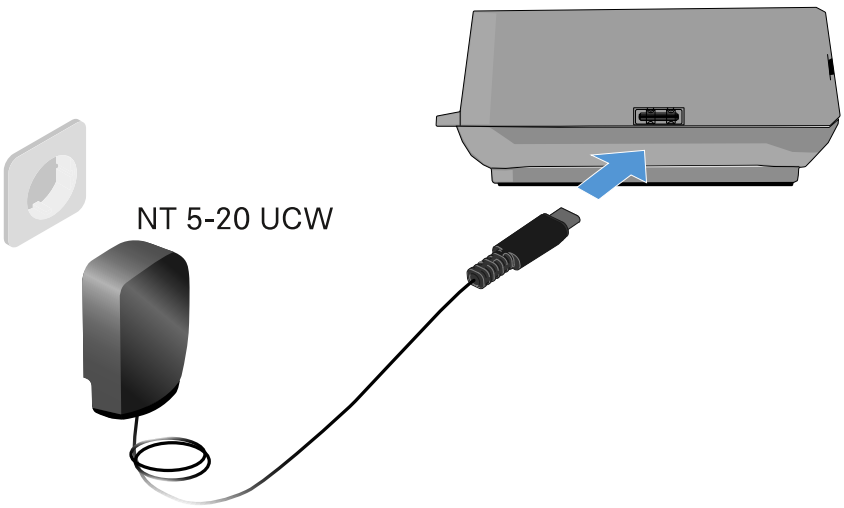
L 70 USB charger

Connecting/disconnecting the charger to/from the power supply system
Charging the rechargeable battery

Connecting/disconnecting the charger to/from the power supply system

To connect the charger to the power supply system:

- Use only the **NT 5-20 UCW** power supply unit from Sennheiser.
- Connect the USB-C plug on the charging cable to the USB-C port on the side of the charger.
- Plug the power supply unit with the correct country adapter into a suitable power outlet.



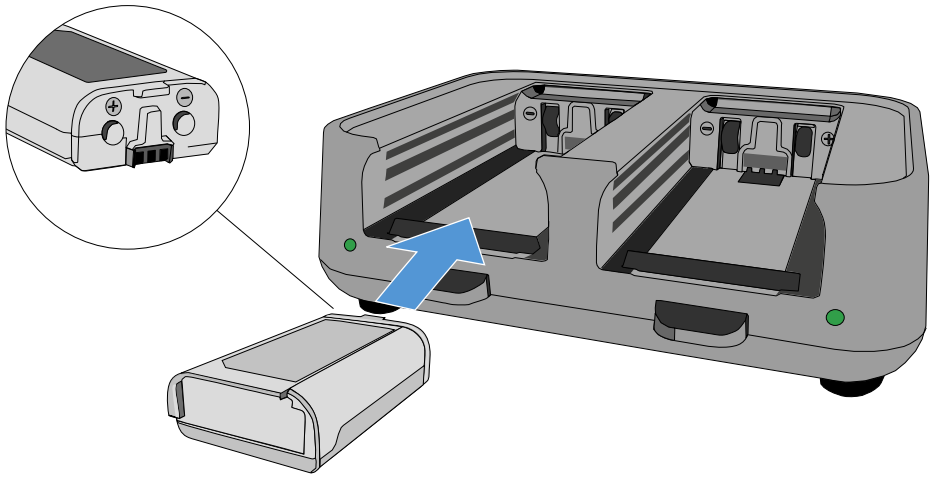
To disconnect the charger from the power supply system:

- Unplug the power supply unit from the wall socket.
- Remove the USB-C plug on the charging cable from the USB-C port on the side of the charger.

Charging the rechargeable battery

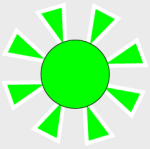
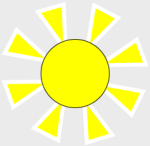
To charge the BA 70 rechargeable battery in the L 70 USB charger:

- Slide the rechargeable battery completely into the charging slot as shown in the figure.



The rechargeable battery will begin charging.

The LED on the charging slot shows the battery's charge level:

LEDs	
	100 %
	> 60 %
	> 20 %
	> 0 %
	Error

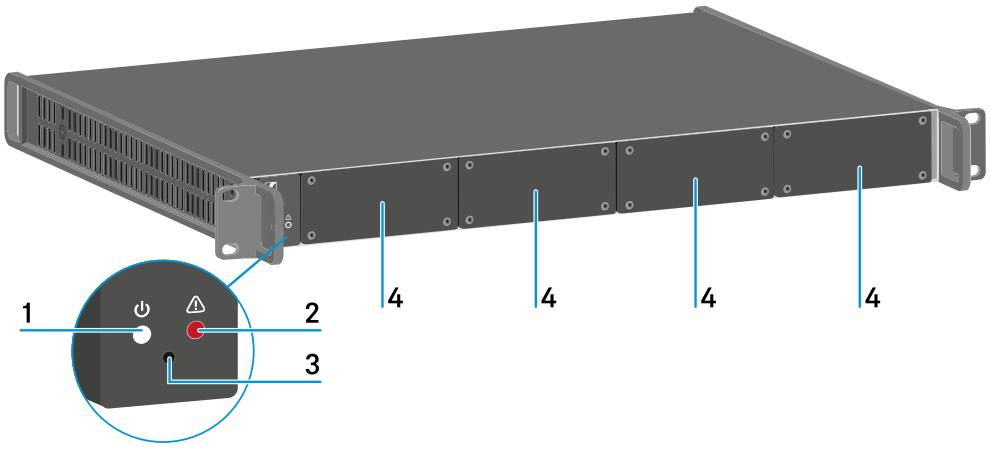
Modular L 6000 charger

These sections contain information about installing, starting up and operating the modular L 6000 charger and the corresponding charging modules.

Product overview
Connecting/disconnecting the L 6000 to/from the power supply system
Connecting the L 6000 to a network
Installing a charging module in the L 6000 charger
Installing the L 6000 in a rack
Switching the L 6000 on and off
Charging the rechargeable batteries in the L 6000 charger
Meaning of the LEDs
Preparing rechargeable batteries for storage (storage mode)
Resetting settings (factory reset)
Updating the firmware
Operating the L 6000 via a network

Product overview

Front



1 Power status LED

- See Meaning of the LEDs

2 Warning status LED

- See Meaning of the LEDs

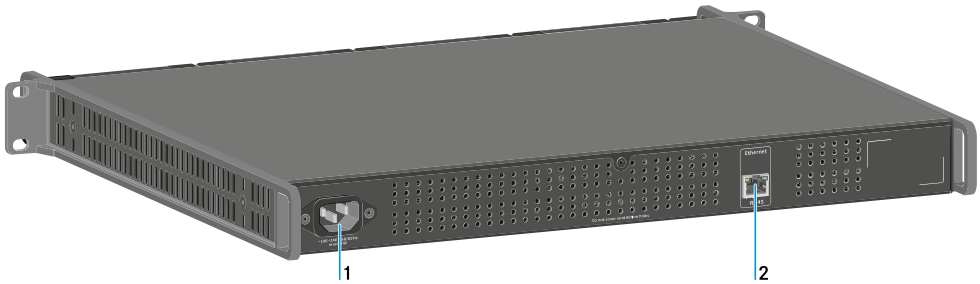
3 Reset

- See Resetting settings (factory reset)

4 Dummy caps

- See Installing a charging module in the L 6000 charger

Back



1 Power socket

- See Connecting/disconnecting the L 6000 to/from the power supply system

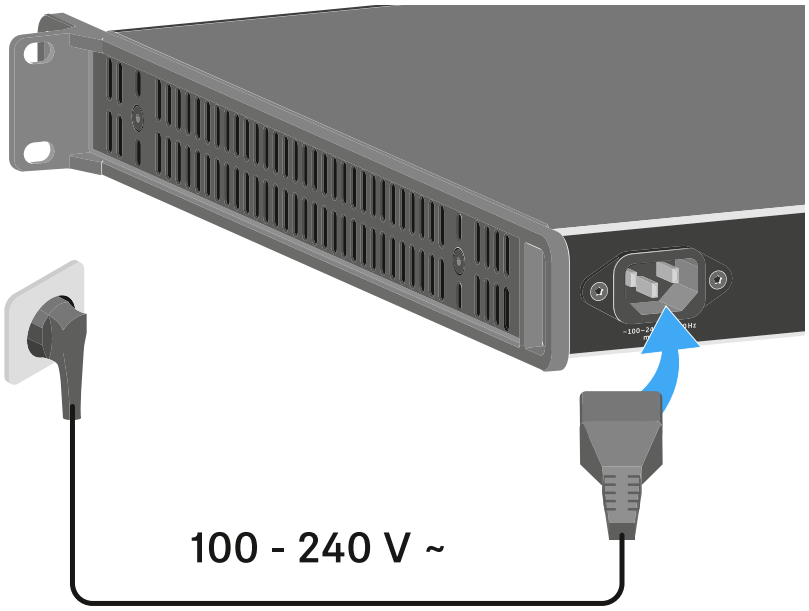
2 Ethernet socket

- See Connecting the L 6000 to a network

Connecting/disconnecting the L 6000 to/from the power supply system

To connect the L 6000 to the power supply system:

- Connect the mains cable IEC connector to the power socket on the rear side of the L 6000.
- Connect the mains cable plug into a suitable wall socket.



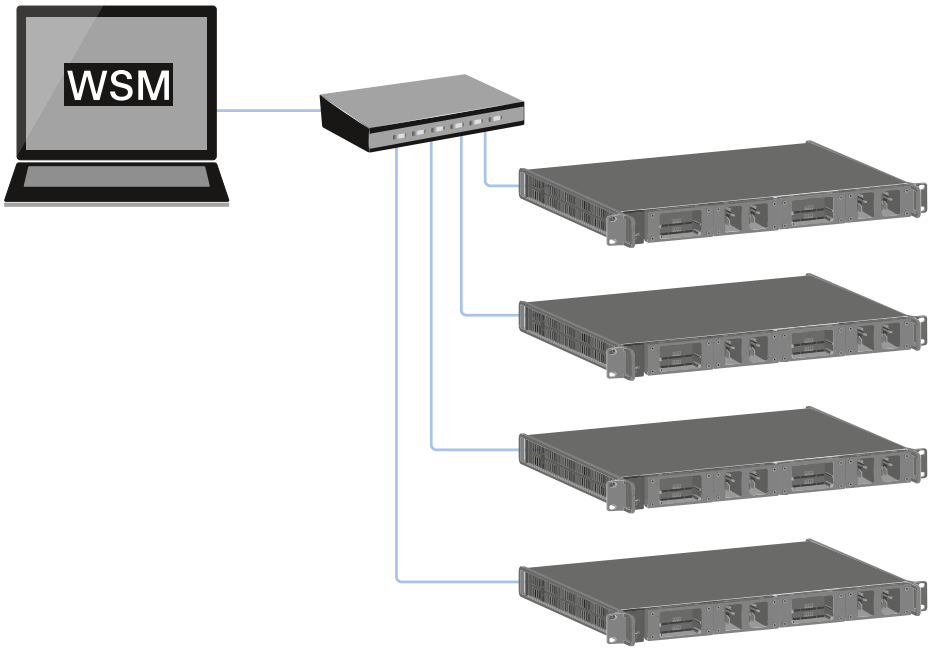
To completely disconnect the L 6000 from the power supply system:

- Unplug the mains cable plug from the wall socket.
- Unplug the mains cable IEC connector from the power socket on the rear side of the L 6000.

Connecting the L 6000 to a network

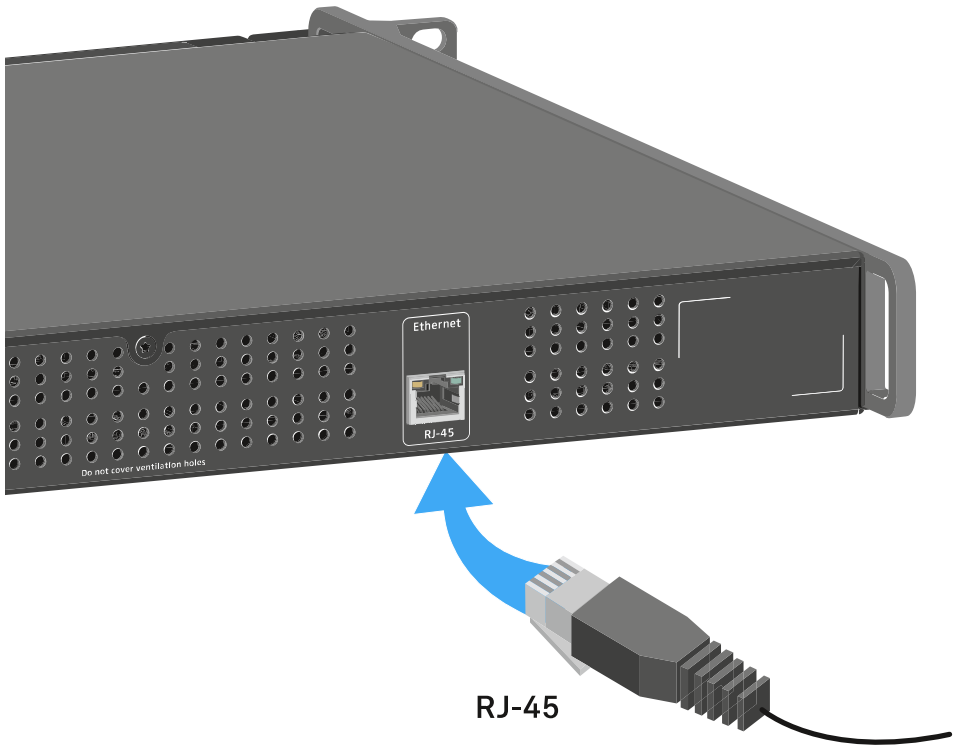
You can monitor and control one or more L 6000s via a network connection using the **Sennheiser Wireless Systems Manager** (WSM) software.

The network does not have to be a homogeneous network including only chargers. You can integrate the L 6000 into your existing network infrastructure with any other types of devices.



To connect the L 6000 to a network:

- Connect a network cable with an RJ-45 connector (Cat5 at minimum) to the **Ethernet** socket on the rear side of the L 6000.



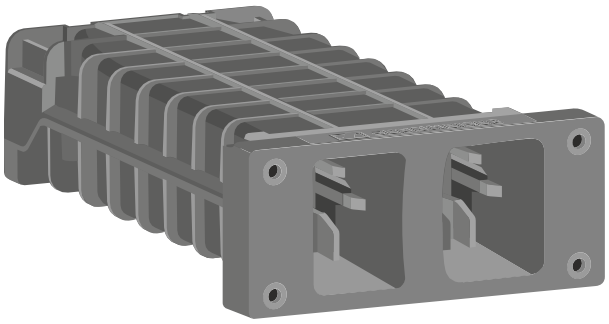
i For more information about controlling devices via the **Sennheiser Wireless Systems Manager** (WSM) software, refer to the instruction manual for the software. You can download the software here:

sennheiser.com/wsm

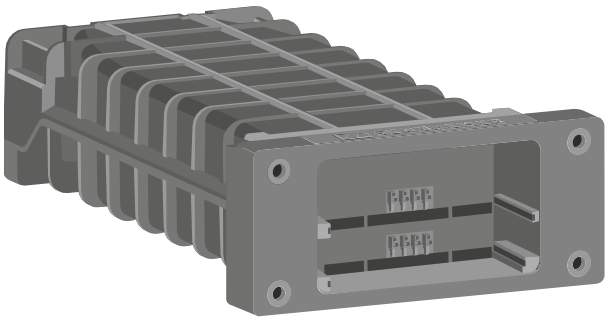
Installing a charging module in the L 6000 charger

The following charging modules are available for the L 6000 charger.

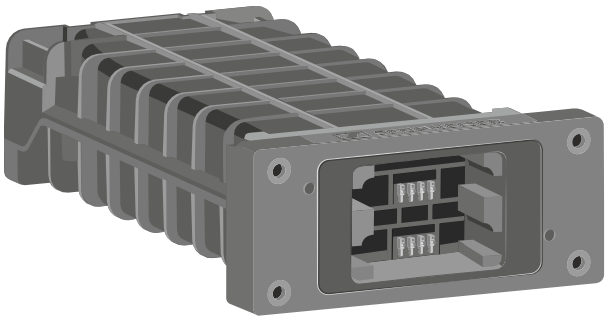
- **LM 6060** -> for charging the **BA 60** rechargeable battery



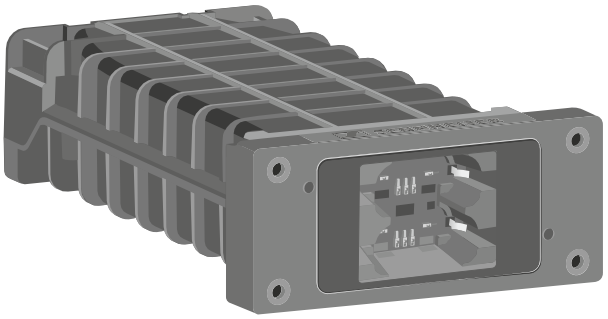
- **LM 6061** -> for charging the **BA 61** rechargeable battery



- **LM 6062** -> for charging the **BA 62** rechargeable battery



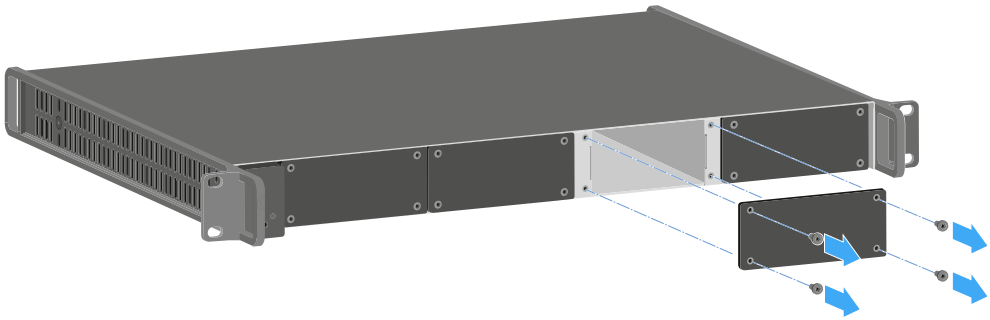
- **LM 6070** -> for charging the **BA 70** rechargeable battery



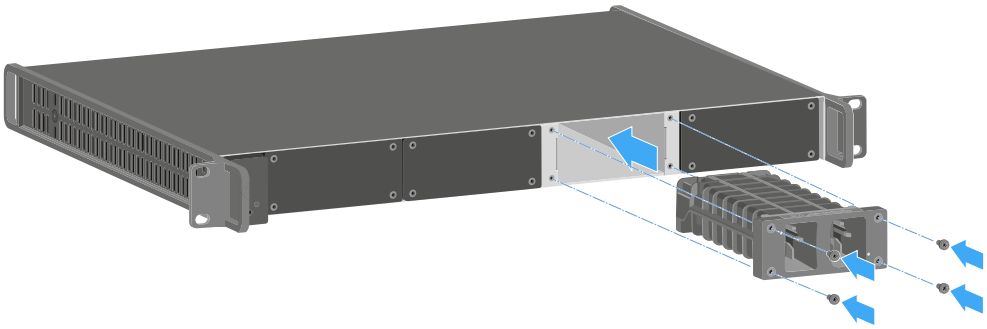
You can combine the LM 6060, LM 6061, LM 6062 and LM 6070 in any way in the L 6000 charger.

To install a charging module in the L 6000 charger:

- Completely disconnect the L 6000 charger from the power supply system. See Connecting/disconnecting the L 6000 to/from the power supply system.
- Unscrew one of the dummy caps on the L 6000.
  To do so, you require a Torx 10 screwdriver.



- Fully slide the charging module into the open charging slot as shown in the figure.
  - The charging module can be inserted into the L 6000 housing only in one direction. The Sennheiser lettering on the charging module must face upward.



- Tightly screw on the charging module.

Always use the latest firmware for the L 6000 charger (version 2.0 or later) to ensure you have access to the full range of functions. You can download the latest firmware from the following address:

sennheiser.com/l-6000

> **i** For more detailed information about charging the BA 60, BA 61 and BA 62 and BA 70 rechargeable batteries, see Charging the rechargeable batteries in the L 6000 charger.

Installing the L 6000 in a rack

You can install the L 6000 charger in any conventional 19" rack.

The rack mounting angles are already attached to the device.

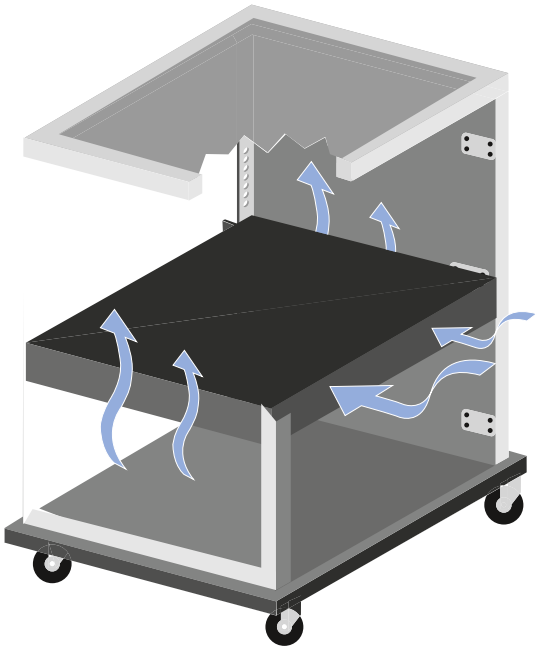
Always observe the following information during rack mounting.

NOTICE

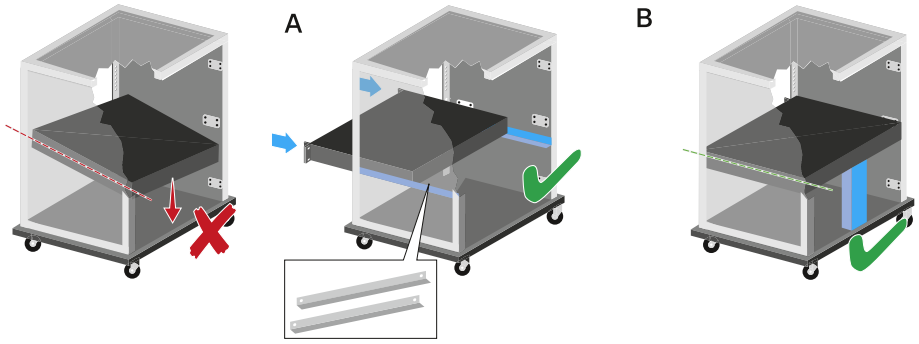
Material damages caused by devices overheating

When there is insufficient ventilation, the devices mounted in the rack may overheat.

- Ensure that there is sufficient ventilation in the rack, particularly if several devices are installed.
- If necessary, install a fan in the rack.



- Support the EM 6000 after installation in the rack. Due to the weight and depth of the device, there is a risk that it may break off in the rack and become damaged as a result.



Version A:

- Use special rack mounting rails.
- The design of the rack used must be suitable for the installation of these mounting rails.

Version B:

- Use a suitable object to support the device on the rear side.
- Ensure that this object cannot become loose.

Switching the L 6000 on and off

The L 6000 does not have a separate on/off switch.

Once the power supply is established, the device is switched on.

▶ See Connecting/disconnecting the L 6000 to/from the power supply system.

Charging the rechargeable batteries in the L 6000 charger

To charge the BA 60, BA 61, BA 62 and BA 70 rechargeable batteries with the L 6000 charger, you need the LM 6060, LM 6061, LM 6062 or LM 6070 charging modules.

Before charging, you have to install the charging modules in the L 6000 charger. For installation information, see Installing a charging module in the L 6000 charger.

Note on the charger firmware

Always use the latest firmware for the L 6000 charger (version 2.0 or later) to ensure you have access to the full range of functions. You can download the latest firmware from the following address:

sennheiser.com/l-6000

Note on the BA 62 rechargeable battery for the SK 6212 bodypack transmitter

It is possible that new rechargeable batteries cannot be fully charged to 100 % in the first few charging cycles.

The remaining operating time may still be unclear after the first few charging cycles. This will improve over time after more charging cycles because the rechargeable battery calibrates itself.

NOTICE

Damage to the charging contacts in the charging slot

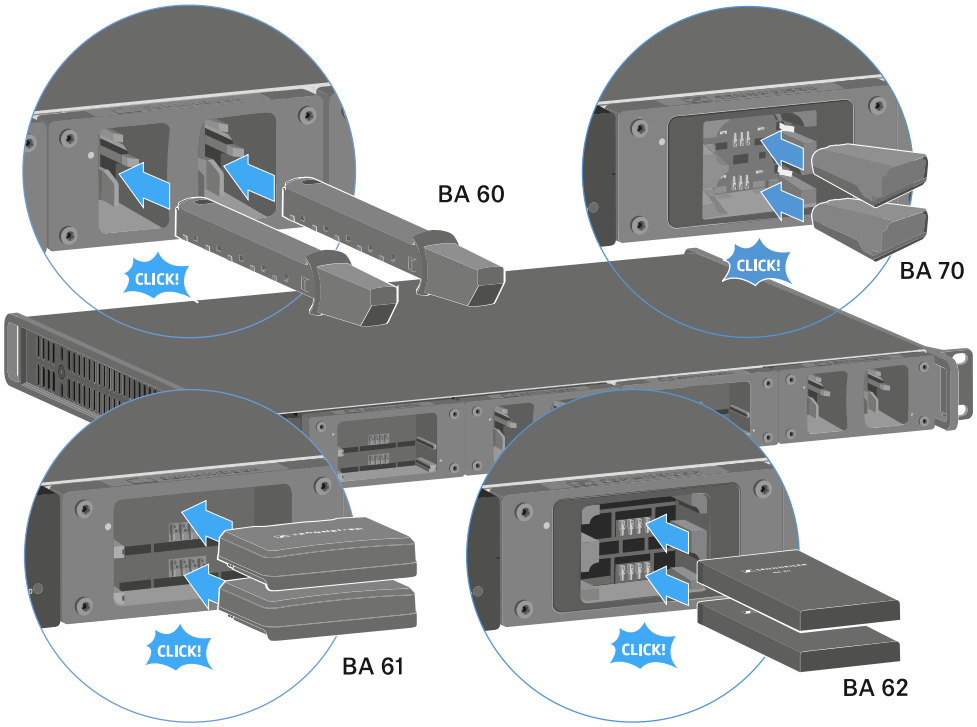
If you touch the contacts in the charging slot, they may become dirty or bent.

- When replacing and removing the rechargeable batteries, ensure that you do not touch the charging contacts in the charging slots.

To charge the rechargeable batteries:

- Insert the rechargeable battery into the charging module as shown in the figure until it audibly clicks into place.

  The rechargeable batteries can be inserted into the charging modules only in one direction. You can see the charge level of the rechargeable batteries from the LEDs on the charging modules (see Meaning of the LEDs).



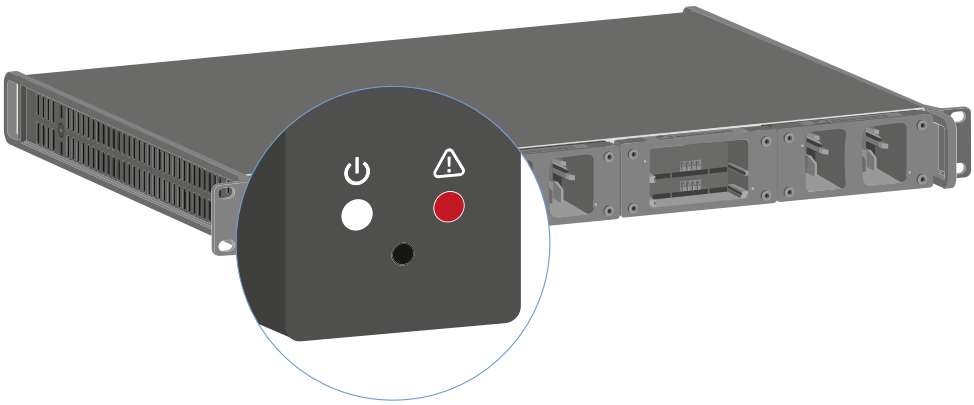
i At ambient temperatures of 45° C (113° F) and above, the rechargeable batteries can no longer be fully charged. They can only be charged to a maximum of 70 %.

Meaning of the LEDs

You can read the following information from the LEDs on the L 6000 charger and the LM 6060, LM 6061, LM 6062 and LM 6070 charging modules:

L 6000 status LEDs

The L 6000 charger has two status LEDs on the front of the device to the left.



White LED **flashing** >> device is starting or firmware is being updated

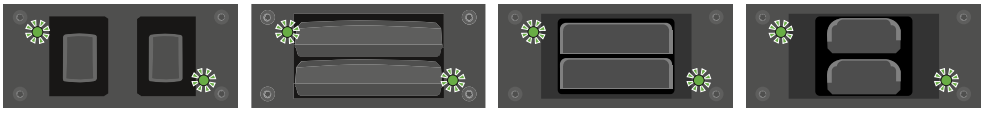
White LED **illuminated** >> device is ready for operation

Red LED **flashing** >> fan is damaged

Red LED **illuminated** >> device is too hot or too cold and the charging process was stopped

LM 6060 | LM 6061 | LM 6062 | LM 6070 status LEDs

The LM 6060, LM 6061, LM 6062 and LM 6070 modules each have two charging slots. Next to each charging slot, there is a status LED that displays the following status information:



Flashing red >> the charging slot or rechargeable battery is too hot or too cold and the charging process was stopped.

Lights up red >> the rechargeable battery is defective.

Flashing yellow >> the rechargeable battery is being regenerated.

Lights up yellow >> the rechargeable battery is being charged. Charge level **0% to 80%**

Flashing green >> the rechargeable battery is being charged. Charge level **81% to 96%**

Lights up green >> the rechargeable battery is fully charged. Charge level **100%**

LM 6060, LM 6061, LM 6062 and LM 6070 status LEDs in storage mode

If you are operating the L 6000 charger in **storage mode** via **WSM**, the meaning of the status indicators changes. You can find more information under Preparing rechargeable batteries for storage (storage mode).

Preparing rechargeable batteries for storage (storage mode)

If you are not using the rechargeable batteries for a longer period of time and therefore want to store them, the rechargeable batteries should have a charge of approx. 70%.

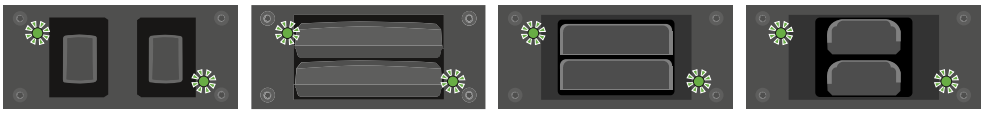
You can set this level using the **storage mode** from the Sennheiser Wireless Systems Manager (WSM) software.

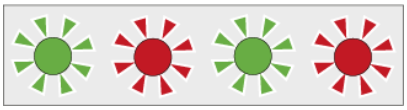
- To do so, connect the L 6000 charger to a network (see Connecting the L 6000 to a network) and establish the connection with the WSM software.

> i For more information about controlling devices via the **Sennheiser Wireless Systems Manager** (WSM) software, refer to the instruction manual for the software. You can download the software here:
>
> sennheiser.com/wsm

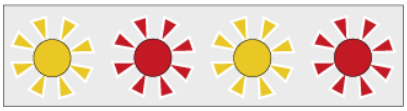
Meaning of the status LEDs in storage mode

In **storage mode**, the status LEDs next to the individual charging slots show the following status information:

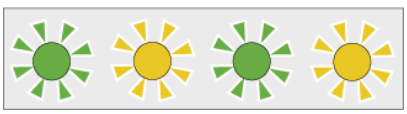




Flashing green/red >> rechargeable battery not inserted.



Flashing yellow/red >> the rechargeable battery is being charged or discharged to 70%.

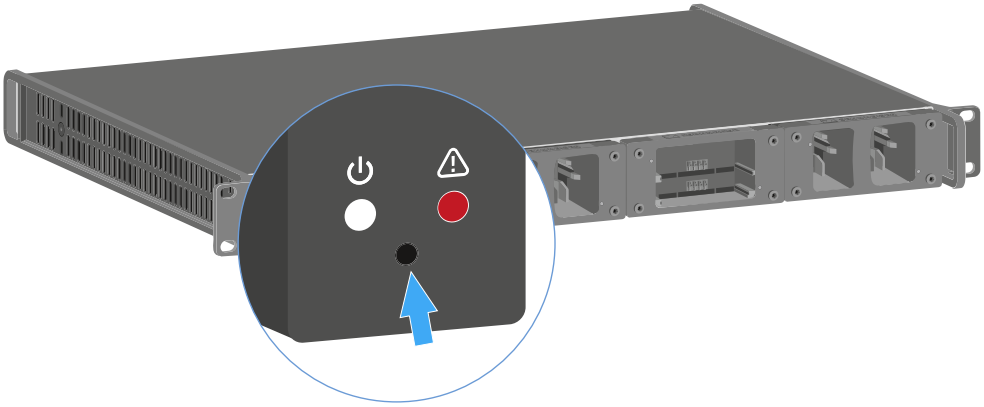


Flashing green/yellow >> the rechargeable battery has reached the storage charge level of 70%.

Resetting settings (factory reset)

To reset the L 6000 charger settings to the factory settings:

- Use a pointed object to press the Reset button on the front of the L 6000 charger.
  - The settings are reset to the factory settings.



Updating the firmware

You can update the firmware for the L 6000 charger using the Sennheiser **Wireless Systems Manager** (WSM) software.

▶ To do so, connect the L 6000 charger to a network (see Connecting the L 6000 to a network) and establish the connection with the WSM software.

> **i** For more information about controlling devices via the **Sennheiser Wireless Systems Manager** (WSM) software, refer to the instruction manual for the software. You can download the software here:
>
> sennheiser.com/wsm

> **i** You can find the **latest firmware** on the Digital 6000 product page or in the Sennheiser website's download area:
>
> sennheiser.com/digital-6000
>
> sennheiser.com/download

Operating the L 6000 via a network

You can use the Sennheiser **Wireless Systems Manager** software to operate the charger via a network connection.

▶ To do so, connect the L 6000 charger to a network (see Connecting the L 6000 to a network) and establish the connection with the WSM software.

> **i** For more information about controlling devices via the **Sennheiser Wireless Systems Manager** (WSM) software, refer to the instruction manual for the software. You can download the software here:
>
> sennheiser.com/wsm

You can perform the following actions using WSM:

- Update the L 6000 charger firmware
- Prepare rechargeable batteries for storage (see Preparing rechargeable batteries for storage (storage mode)).

Cleaning and maintenance

Note the following information when cleaning and maintaining products of the Spectera series.

NOTICE

Liquids can damage the electronics of the product

Liquids entering the product housing can cause a short-circuit and damage the electronics.

- Keep all liquids away from the products.
- Do not use any solvents or cleansing agents.
- Disconnect the mains-operated products from the power supply system and remove rechargeable batteries and batteries (if present) before you begin cleaning.
- Clean all products only with a soft, dry cloth.

- Note the special cleaning instructions below for the following products.

Replacing the Base Stations fan filter

- Check the filter from time to time and replace it if necessary. See Changing the fan filter.

Cleaning the L 70 USB and CHG 70N chargers

- Remove all rechargeable batteries from the charging slots.
- Disconnect the charger from the power supply system before cleaning.
- Clean the product with a dry cloth.
- In addition, use a brush to remove dust from the charging slots.
- Clean the charging contacts from time to time with a cotton swab, for instance.

4. Knowledge Base

Central hub for information, resources, and guides with further content on the product and/or service.

Related information
Network & Security Guide

Network & Security Guide

This document is intended for IT administrators, system integrators and event technicians and serves as an planning and configuration guide for integrating components of the Spectera offering into diverse network environments from small home networks up to enterprise networks.

The guide contains recommendations on network setup for transmission of control data and audio content (via Dante®).

Related information
General requirements
Network setups
Ports, protocols and services
Security
Best practice

General requirements

Related information
Operating systems
Network

Operating systems

The Spectera Base Station as network device is able to be controlled by network-capable PC or Mac devices.

The following system requirements apply for operation with Spectera Web UI and Sennheiser LinkDesk:

System requirements

Recommended for Host PC Client

- Intel i5 Dual Core processor/M1 Mac/or similar
- 16 GB RAM
- At least 4 GB hard disk space (5 GB for Mac devices)
- Gigabit LAN interface
- Windows® 10, 11, Server 2019, Server 2022 (x64) or higher
- Mac OS Big Sonoma or later
- IPv4 network

Port requirements

Address	Port	Protocol	Type	Service	Usage
ANY	443	HTTPS (TCP)	Unicast	Spectera Base Station API	Communication to devices
sennheiseruserinsights.matomo.cloud	443	HTTPS (TCP)	Unicast	Sennheiser user insights	Analytics of usage and operational data
cdn.matomo.cloud	443	HTTPS (TCP)	Unicast	Sennheiser user insights	Analytics of usage and operational data

Client browser

- Google Chrome (latest version)
- Mozilla Firefox (latest version)
- Microsoft Edge (latest version)
- Apple Safari (latest version)
- JavaScript must be activated

Network

Bandwidth and speed

When it comes to bandwidth requirements for high-quality audio, there are a number of factors that can affect the input and output of the audio. The network speed required for especially audio transmission via Dante® should be as high as possible to ensure a smooth listening experience. As a rule, the minimum bandwidth for transmitting and receiving audio at the Spectera Base Station is approximately the following:

The majority of audio used in professional settings is PCM (uncompressed), sampled at 48 kHz and a bit depth (word length) of 24 bits. Dante® audio is unicast by default but can be set to use multicast for cases of one-to-many distribution.

- Dante® packages audio into flows to save on network overhead.
- Unicast Audio flows contain up to 4 channels. The samples-per-channel can vary between 4 and 64, depending on the latency setting of the device. Bandwidth usage is about 6 Mbps per typical unicast audio flow.
- Bandwidth for multicast flows is dependent on the number of audio channels used. Bandwidth is about 1.5 Mbps per channel.

Source: Dante Information for Network Administrators

Internet access

For both components Spectera Base Station and Sennheiser LinkDesk we recommend to provide permanent Internet access. Please refer to chapter Ports, protocols and services to get more details about used Internet services.

> **i** At least for the initial product activation of the Spectera Base Station and for the use of the optional Sennheiser Account Login in Sennheiser LinkDesk it is mandatory to have a direct Internet access and DNS support.

> **i** At the moment it is not possible to manually configure any network proxy and DNS server at Spectera Base Station. Please make sure to provide direct Internet access e.g. via white-listing the device and any used port, protocol and domain and using DHCP to provide DNS server settings.

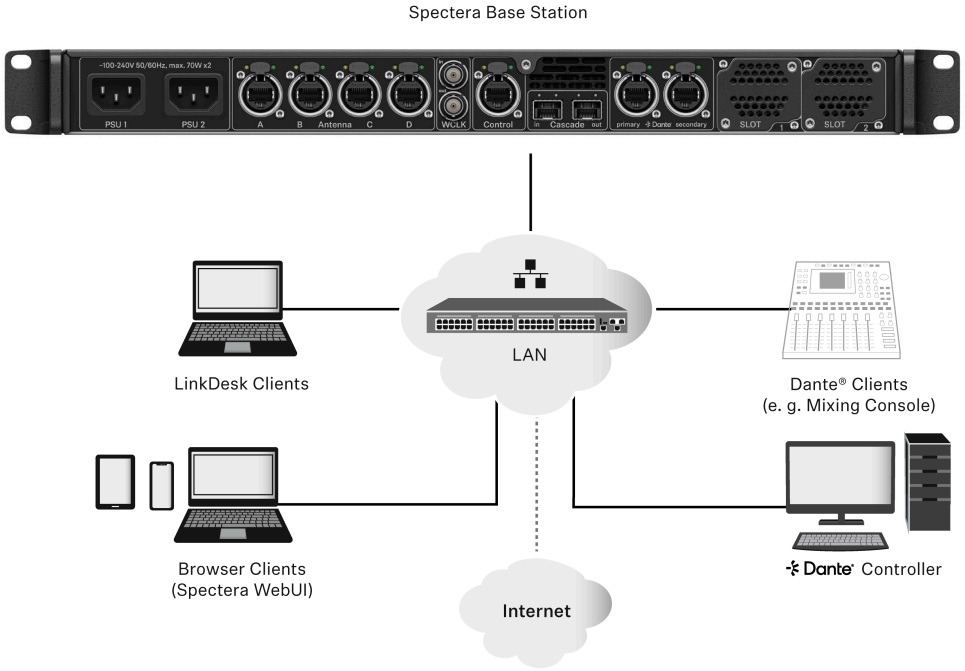
Cabeling

As long as a good Internet speed is guaranteed, the network cable used determines the actual transmission speed of data sent and received in the network.

i To ensure a reliable transmission speed of audio and control data with the Spectera Base Station, please use an RJ45 network cable with the CAT5e S/FTP standard or higher.

Network setups

To operate the several components of the Spectera offering they need to be integrated into a network setup, either existing or new. Following figure shows a general overview of the network setup and their participants.



Spectera Base Station

This Sennheiser device has 3 network interfaces. One interface dedicated for control data and two interfaces for audio data (specifically Dante®). There is a primary and a secondary interface for redundancy of the audio transmission.

Sennheiser LinkDesk client

This client can be any host computer (PC or Mac), with the LinkDesk software application installed.

Browser Client (Spectera WebUI)

This client can be any host computer (PC, Mac, Tablet, Smartphone), with a supported web browser installed, accessing the Spectera WebUI.

Dante® client

This can be any device with a Dante® network interface installed. This ranges from Virtual Dante® Soundcards installed on a host computer up to dedicated devices like a Mixing Console.

Dante® Controller

This is typically host computer (PC or Mac), with the Dante® Controller software application installed. This application configures and controls all the Dante® devices and audio streams inside the network.

Network router

This can be any router device for routing the network communication inside the Local Area Network (LAN) and providing the gateway to other networks and to the Internet.

Related information
Spectera Base Station - network configuration

Spectera Base Station - network configuration

Depending on the desired network address configuration all network interface (Control and both Dante®) can be operated in following IP Modes with IPv4 only:

- Fixed/Static IP
- Auto IP (DHCP or Zeroconf)

Additionally it can be configured if mDNS/DNS-SD information shall be published by the device or not.

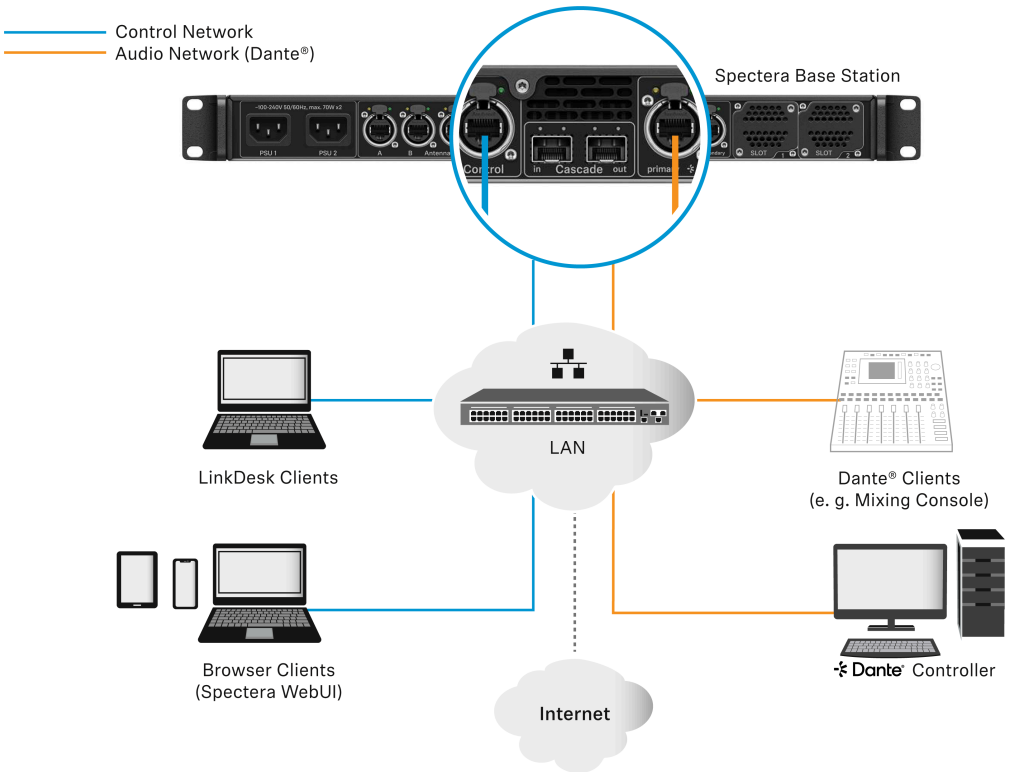
Dante® restrictions

- It is not possible to deactivate the Dante® functionality for the both Dante® ports.
- Dante® ports are shutdown when the device is in standby mode.
- Network configuration of Dante® ports can only be done via Dante® Controller software application.
- By default the Dante® ports are configured to Auto IP. If Fixed/Static IPs have been configured and the device cannot be reached anymore, the IP Mode can only be reset to Auto IP by a Factory Reset of the device.
- The Dante primary and secondary networks must not be directly connected to each other (network loop). Make sure you always connect the Base Station Dante network ports to two different networks that do not run via a common switch.

Shared Network Mode

In Shared Network Mode both networks for Control and Dante® are using the same physical network infrastructure.

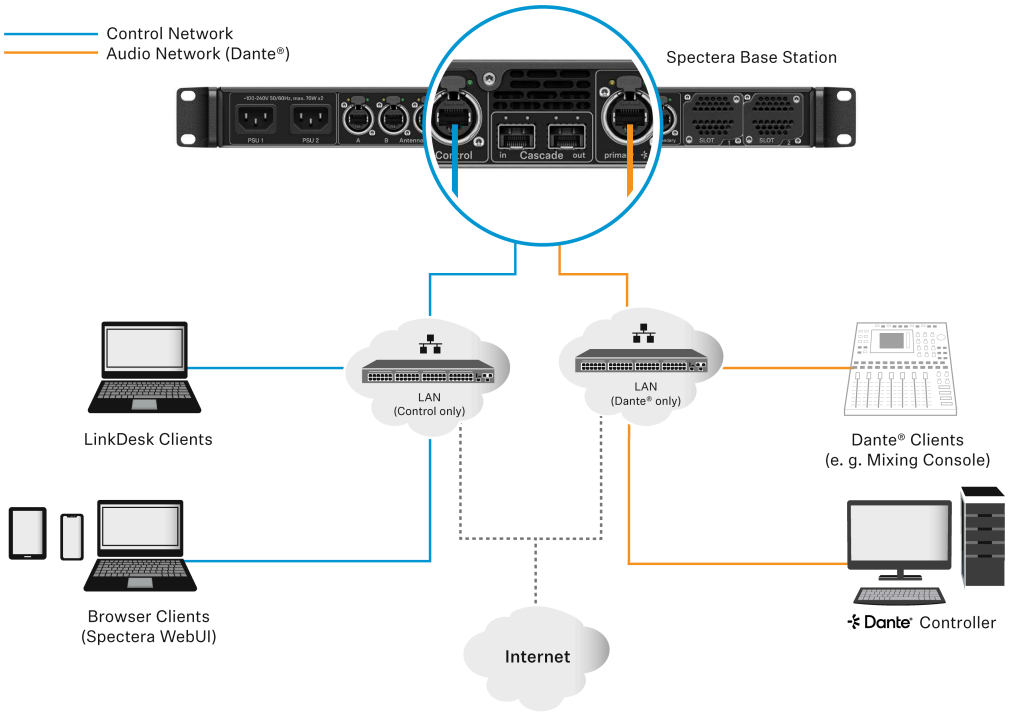
- Configure both Control and Dante® networks over one switch / router.
- Use two different IPs to address the Control network and the Dante® network separately.



Split Network Mode

In Split Network Mode both networks for Control and Dante® are using different physical network infrastructure.

- Configure both Control and Dante® networks over two different switches / routers.
- Use two different IPs to address the Control network and the Dante® network separately.



Ports, protocols and services

Related information
Sennheiser LinkDesk
Spectera Base Station
Dante® ports

Sennheiser LinkDesk

In order to use the Sennheiser LinkDesk software, certain ports must be enabled (especially for the organization/enterprise firewall) for communication between software and devices.

> **i** If necessary, please contact the local administrator to configure the required ports.

Port requirements

Address	Port	Protocol	Type	Service	Usage
LOCALHOST	54352	HTTPS (TCP)	Unicast	LinkDesk backend	Internal backend communication
ANY	443	HTTPS (TCP)	Unicast	Spectera Base Station API	Communication to devices
Accounts EMEA [1] B2C Configuration [2]	443	HTTPS (TCP)	Unicast	Sennheiser CIAM	Sennheiser account Sign-in/Log-in
User insights [3] User insights [4]	443	HTTPS (TCP)	Unicast	Sennheiser user insights	Analytics of usage and operational data
ANY	443	HTTPS (TCP)	Unicast	Spectera Base Station API	Base Station API communication from devices
224.0.0.251	5353	mDNS (UDP)	Multicast	mDNS, DNS-SD	(optional - if desired) Device/service discovery

[1] accounts-pro-emea.sennheiser-cloud.com

2	b2c-config.sennheisercloud.com
3	sennheiseruserinsights.matomo.cloud
4	cdn.matomo.cloud

Spectera Base Station

In order to use the Spectera Base Station device in a network, certain ports must be enabled (especially for the organization/enterprise firewall) for communication between software and devices.

> **i** If necessary, please contact the local administrator to configure the required ports.

Port requirements

Address	Port	Protocol	Type	Service	Usage
Device Outbound					
ANY	443	HTTPS (TCP)	Unicast	Spectera Base Station API	Device Communication to Clients
sennheiseruserinsights.matomo.cloud cdn.matomo.cloud	443	HTTPS (TCP)	Unicast	Sennheiser User Insights	Analytics of usage and operational data
my.nalpeiron.com	80	HTTPS (TCP)	Unicast	Sennheiser License Server	Activation of devices
ANY (see list of NTP servers)	123	NTP	Unicast	NTP Time Sever	Synchronize system time
224.0.0.251	5353	mDNS (UDP)	Multicast	mDNS, DNS-SD	(optional - if desired) Device/Service Discovery
ANY (see list of Dante® ports)					
Device Inbound					
ANY	443	HTTPS (TCP)	Unicast	Spectera Base Station API	Device Communication from Clients
ANY (see list of Dante® ports)					Dante® audio and control data

NTP servers

To correctly operate with licenses and certificates, the Spectera Base Station needs a correct system time. The device will use the well-established NTP mechanism from the IP protocol

stack to synchronize clock between a time server in a network and the client inside the device.

Currently for an IT administrator or system integrator it is not possible to manually configure a dedicated NTP server to be used by the Spectera Base Station. Being able to configure a dedicated NTP server manually is a planned feature for an upcoming release.

The device behaves the following way:

- If a time server configuration has been provided via DHCP or manually, it tries to connect and sync to that time server first.
- Otherwise the device is trying to access any server of following list of time server pools worldwide publicly available.

> **i** An IT administrator has to assure to provide Internet access to at least one of the server pools and to provides DNS settings via DHCP to the device.

List of NTP time server pools:

- pool.ntp.org
- time.nist.gov
- time.aws.com
- time.cloudflare.com

Dante® ports

To set up a Dante® network, defined port information is required.

The table below shows which ports, URLs and servers are used. For detailed information, please refer directly to the website: getdante.com

Dante® ports

External Dante® ports

Address	Port	Usage	Type
239.255.0.0/16	4321	ATP Multicast Audio	Multicast
239.69.0.0/16	5004	AES67 Multicast Audio	Multicast
224.0.1.129-132	319, 320	PTP	Multicast & Unicast (DDM)
224.0.0.251	5353	mDNS	Multicast
224.0.0.230 – 233	8700 - 8708	Multicast Ctrl & Monit.	Multicast
239.254.1.1	9998	Logging	Multicast
239.254.3.3	9998	TP Logging (if enabled)	Multicast
239.254.44.44	9998	Logging	Multicast
239.255.255.255	9875	SAP (AES67 discov.)	Multicast
UDP	28800, 28700-28708	Ctrl. & Monitoring.(ext)	Unicast
UDP	38800, 38700-38708	DVS control & monitoring (ext)	Unicast

Internal Dante® ports

Proto-col	Port	Usage	Type
UDP	14336 -14591	Unicast Audio [Excluding Via]	Unicast
UDP	34336-34600	Unicast Audio [Via Only]	Unicast
UDP	4440, 4444, 4455	Audio Control [Excluding Via]	Unicast
UDP	24440, 24441, 24444, 24455	Audio Control [Via Only]	Unicast
UDP	4777	Via Control [Via Only]	Unicast

Proto-col	Port	Usage	Type
TCP	4777	Via Websocket	Unicast
UDP	8850,28900, 24445	Via control & Monitoring (int.)	Unicast
UDP	8850, 38900, 8899	DVS control & monitoring (int.)	Unicast
UDP	8000	Dante Domain Manager Device Port	Unicast
UDP	8001	Dante Millau Device Proxy (int.)	Unicast
UDP	8002	Dante Lock Server	Unicast
UDP	8751	Dante Controller metering port	Unicast
UDP	8800	Control & Monitoring	Unicast
TCP	8753	mDNS clients (Internal only)	Unicast
TCP	16100-16131	HDCP Authent. for Video Endpoints	Unicast
UDP	61440-61951	FPGA level audio flow keepalive	Unicast
TCP	4778	DVS websocket (Apple Silicon only)	Unicast

Security

Related information
Certificates
Device password
Encrypted data transmission

Certificates

Spectera Base Station is using a self-signed certificate for network communication.

> **i** Currently it is not possible to replace it with a CA-signed certificate. The certificate is generated in factory and will be renewed with every factory reset.

When accessing the Spectera WebUI with a browser for the first time you will get a security warning informing about an unknown certificate. The security warning depends on the browser you are using. Depending on your browser, click on Advanced or Show Details (Safari) and then on:

- Microsoft Edge: **Continue to localhost (unsafe)**
- Google Chrome: **Proceed to localhost (unsafe)**
- Firefox: **Accept the Risk and Continue**
- Apple Safari: **[...] visit this Website** > **Visit Website**
- or similar (other browsers)

In order to prevent man-in-the-middle (MITM) attacks, Sennheiser LinkDesk has some built-in security measures. Because of these measures, you might receive a certificate mismatch warning while working with a Base Station. In some cases, these can occur even though there is actually no security issue. These are:

- The Base Station has been factory reset since the last connect. In this case you can safely confirm the connection and proceed when encountering the mismatch warning.
- A different Base Station has been connected via the same IP address. In this case please verify if the IP Address you are using is indeed the correct IP Address of the intended Base Station.

Device password

The device access via network control API and Web UI of Spectera Base Station and via Sennheiser LinkDesk is password protected, to avoid configuring the device by unauthorized actors inside the network.

After unboxing and after every factory reset of the device a new password has to be configured by the user to claim the access to the device. Every instance of Sennheiser LinkDesk remembers the passwords of the devices it has claimed already. Protecting the access by unauthorized actors to the Sennheiser LinkDesk application on a host, other mechanisms have to be applied, e.g. password protected user accounts in Windows or MacOS.

With every new browser session of the Spectera WebUI the configured password has to entered again.

Encrypted data transmission

All control data transmission on HTTPS protocol is encrypted using Transport Layer Security (TLS).

All control data transmission on HTTP protocol to the Sennheiser License Server is encrypted on Application Level.

All audio data transmission via Dante® is not encrypted, since not supported yet.

Best practice

Related information
Sharing Internet connection in small network setups

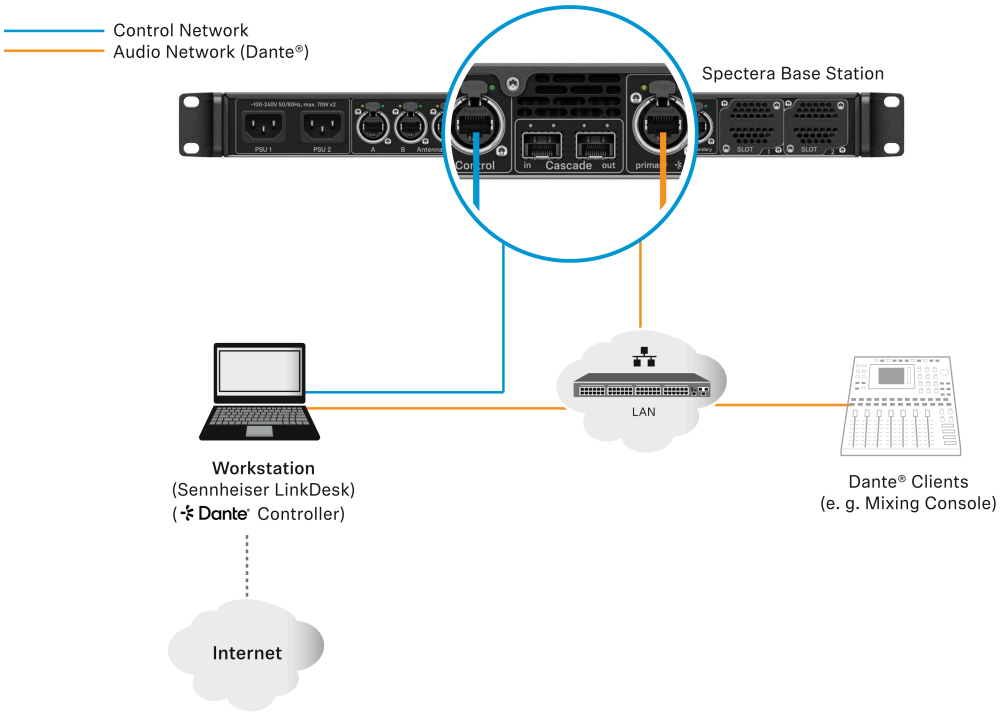
Sharing Internet connection in small network setups

It is possible to operate the Spectera offering without dedicated router networks e.g. in really small setups, but we do recommend to always use some kind of home network router for trouble-free usage.

Especially for providing Internet access to Spectera Base Station it is possible to use the builtin functionality of Windows and MacOS for Internet Connection Sharing.

> For enterprise networks we DO NOT RECOMMEND the usage of Internet Connection Sharing. Most of the times it is even prohibited by enterprise IT policy to use such service.

The network setup might look like this:



Inside this setup one workstation is used for all client software applications (Sennheiser LinkDesk, Spectera WebUI, Dante® Controller). Either two separated wired network interface

are used for control and audio (Dante®) or one interface gets shared. Please be aware that in such setups (typically) no DHCP service is activated. Use either manual IP settings or ZeroConf configuration.

For Internet Connection Sharing typically an existing network connection (Wi-Fi or Ethernet) with Internet access gets shared with another selected network interface of the host.

In order to share your Internet connection on Windows:

- Connect your client device to your host PC using an Ethernet cable. If either device doesn't have a free Ethernet port, use a USB-to-Ethernet adapter.
- Go to the **Network Connections** menu. The easiest way to get there is by searching for "Network Connections" in the Windows Search box.
- Right-click on the network adapter connected to the Internet (for example, Wi-Fi or modem), and then select **Properties**.
- Toggle **Allow other network users to connect** to **ON** from the Sharing tab and select the relevant Ethernet port from the pull-down menu.

> **i** Note that, if you have VPN software installed, you may see a lot of virtual Ethernet ports on your list and you'll need to pick the real one.

✓ After you click OK, Internet should flow to your client device over its Ethernet port. For more details on sharing an Internet connection please refer to the Microsoft Support page.

In order to share your Internet connection on MacOS:

- On your Mac, choose **Apple menu** > **System Settings**.
- Click on **General** in the sidebar and then on **Sharing** (you may need to scroll down).
- Turn on **Internet Sharing** and click on **Configure**.
- Click the **Share your connection** from pop-up menu.
- Choose the Internet connection you want to share ((For example, if you're connected to the Internet over Wi-Fi, choose Wi-Fi).
- Under **To devices using**, turn on the port other devices can use to access the shared internet connection. (For example, if you want to share your Internet connection over Ethernet, select Ethernet).

> **i** If you're sharing to devices using Wi-Fi, configure the Internet-sharing network, then click **OK**.

- Click on **Done**.

> For more details on sharing an Internet connection please refer to the Apple Support page.

✓ Your Internet connection will be shared on MacOS/Windows.

5. Specifications

All technical data, system requirements and frequencies at a glance.

Spectera System
Base Station
SEK
DAD
CHG 70N-C charger
BA 70 rechargeable battery
L 70 USB charger
Modular L 6000 charger
LM 6060 | LM 6061 | LM 6062 | LM 6070 charging modules

Spectera System

Transmission scheme

- Multicarrier, TDMA, TDD

RF channel

- Bandwidth: 6 or 8 MHz countrywise limited
- Mobiles devices: up to 128 per RF channel
- Audio links: up to 128 per RF channel

Radio frequency range

- UHF: 470 - 608 MHz, 630 - 698 MHz
- 1G4: 1350 - 1400 MHz, 1435 - 1525 MHz
- countrywise limited

Audio frequency response

- 20 Hz to 20,000 Hz (±1 dB) (Audio link modes with SeDAC and PCM audio codecs only)

Encryption

- AES 256 CTR Mode exp. >10k years

Audio link modes

MIC/LINE	Mono	Max links per RF carrier	Utilized % of RF carrier	Audio codec	La-tency	Range
Raw Low Latency	Mono	8	12.5 %	PCM	1.0 ms	Redu ced
Raw	Mono	16	6.25 %	PCM	1.6 ms	Redu ced
Live Low Latency	Mono	8	12.5 %	SeDAC	1.0 ms	Exten ded
Live	Mono	16	6.25 %	SeDAC	1.6 ms	Exten ded
Live Link Density	Mono	32	3.13 %	SeDAC	2.7 ms	Stand ard
Max Range	Mono	16	6.25 %	OPUS	9.9 ms	Maxi mum
Max Link Density	Mono	128*	0.78 %	OPUS	15.2 ms	Redu ced

IEM/IFB	Mono/ Stereo	Max links per RF carrier	Utilized % of RF carrier	Audio codec	La-ten-cy	Range
Live	Mono	16	6.25 %	SeDAC	1.6 ms	Exten ded
Live Link Density	Mono	32	3.13 %	SeDAC	2.7 ms	Stand ard
Max Range	Mono	16	6.25 %	OPUS	9.9 ms	Maxi mum
Max Link density	Mono	128*	0.78 %	OPUS	15.2 ms	Redu ced
Live Ultra Low Latency	Stereo	4 (8 ch)	25 %	SeDAC	0.7 ms	Exten ded
Live Low Latency	Stereo	8 (16 ch)	12.5 %	SeDAC	1.1 ms	Exten ded
Live	Stereo	16 (32 ch)	6.25 %	SeDAC	1.6 ms	Stand ard
Live Link Density	Stereo	32 (64 ch)**	3.13 %	SeDAC	2.7 ms	Redu ced

* Base Stations have 32 audio outputs, for 128 links in a single RF channel, 4 Base Stations and firmware update with cascade port function are required (future release)

** Base Stations have 32 audio inputs, for 32 stereo links (64 ch) in a single RF channel, 2 Base Stations and firmware update with cascade port function are required (future release)

Base Station

General

RF channels

- 2

Audio inputs and outputs

- Input: up to 32 channels
- Output: up to 32 channels
- Individually selectable from digital audio interfaces

Digital audio inputs and outputs

- Dante®
    - Ethernet, 1 Gbit/s
    - 2× ruggedized RJ45 (Primary and Secondary)
    - 32 In, 32 Out, 48 kHz or 96 kHz, 16/24/32 bit
- MADI (AES10)
    - 2× Expansion Slots for MADI Card OM (optical fiber multimode) or MADI Card BNC (separate accessories)
    - 32 In, 32 Out, 48 kHz or 96 kHz, 16/24 bit
- Individual sample rate for each interface

Headphone output

- 6.3 mm jack
- 2x 50 mW at 32 Ω -40 dB THD (1%) at 1 kHz

Antenna connections

- 4 × ruggedized RJ45, PoE supply for up to 4 DAD UHF/1G4

Antenna cable

- Category 5e or higher, S/UTP (maximum 100 m)

Word clock input

- Input: BNC, 75 Ω
- Output: BNC, 75 Ω
- Sampling rates: 48 kHz, 96 kHz

Control

- Ethernet, 1 Gbit/s, ruggedized RJ45

Cascade in / out*

- 2 × SFP+ cages (to be equipped with 10 Gbit/s modules)

Power supply

- 2 x internal redundant
- 100 to 240 V AC, 50/60 Hz

Power consumption

- 70 W

Power plug

- 3-pin, protection class I as per IEC/EN 60320-1

Dimensions (H × W × D with mounting elements)

- 44 × 483 × 373 mm (1.73" x 19.02" x 14.69")

Weight

- Approx. 6.3 kg (13.89 lbs) (without accessories)

Temperature

- Operation: –10 °C to +50 °C (14 °F to 122 °F)
- Storage: –25 °C to +70 °C –13 °F to 158 °F)

Relative air humidity

- 25 % to 95 % (non-condensing)

Dripping and splashing liquids

- The product must not be exposed to dripping and splashing liquids (IP2X)

*Software update with cascade port function required (future release)

Port requirements

Address	Port	Protocol	Type	Service	Usage
Device Outbound					
ANY	443	HTTPS (TCP)	Unicast	Spectera Base Station API	Device Communication to Clients
sennheiseruserinsights.matomo.cloud cdn.matomo.cloud	443	HTTPS (TCP)	Unicast	Sennheiser User Insights	Analytics of usage and operational data
my.nalpeiron.com	80	HTTPS (TCP)	Unicast	Sennheiser License Server	Activation of devices
ANY (see list of NTP servers)	123	NTP	Unicast	NTP Time Sever	Synchronize system time
224.0.0.251	5353	mDNS (UDP)	Multicast	mDNS, DNS-SD	(optional - if desired) Device/Service Discovery
ANY (see list of Dante® ports)					
Device Inbound					
ANY	443	HTTPS (TCP)	Unicast	Spectera Base Station API	Device Communication from Clients
ANY (see list of Dante® ports)					Dante® audio and control data

NTP servers

- pool.ntp.org
- time.nist.gov
- time.aws.com
- time.cloudflare.com

Dante® ports

External Dante® ports

Address	Port	Usage	Type
239.255.0.0/16	4321	ATP Multicast Audio	Multicast

Address	Port	Usage	Type
239.69.0.0/16	5004	AES67 Multicast Audio	Multicast
224.0.1.129-132	319, 320	PTP	Multicast & Unicast (DDM)
224.0.0.251	5353	mDNS	Multicast
224.0.0.230 – 233	8700 - 8708	Multicast Ctrl & Monit.	Multicast
239.254.1.1	9998	Logging	Multicast
239.254.3.3	9998	TP Logging (if enabled)	Multicast
239.254.44.44	9998	Logging	Multicast
239.255.255.255	9875	SAP (AES67 discov.)	Multicast
UDP	28800, 28700-28708	Ctrl. & Monitoring.(ext)	Unicast
UDP	38800, 38700-38708	DVS control & monitoring (ext)	Unicast

Internal Dante® ports

Protocol	Port	Usage	Type
UDP	14336 -14591	Unicast Audio [Excluding Via]	Unicast
UDP	34336-34600	Unicast Audio [Via Only]	Unicast
UDP	4440, 4444, 4455	Audio Control [Excluding Via]	Unicast
UDP	24440, 24441, 24444, 24455	Audio Control [Via Only]	Unicast
UDP	4777	Via Control [Via Only]	Unicast
TCP	4777	Via Websocket	Unicast
UDP	8850,28900, 24445	Via control & Monitoring (int.)	Unicast
UDP	8850, 38900, 8899	DVS control & monitoring (int.)	Unicast
UDP	8000	Dante Domain Manager Device Port	Unicast
UDP	8001	Dante Millau Device Proxy (int.)	Unicast
UDP	8002	Dante Lock Server	Unicast
UDP	8751	Dante Controller metering port	Unicast
UDP	8800	Control & Monitoring	Unicast
TCP	8753	mDNS clients (Internal only)	Unicast

Proto-col	Port	Usage	Type
TCP	16100-16131	HDCP Authent. for Video Endpoints	Unicast
UDP	61440-61951	FPGA level audio flow keepalive	Unicast
TCP	4778	DVS websocket (Apple Silicon only)	Unicast

SEK

RF transmission power

- up to 50 mW; countrywise limited

RF channels

- 1

Headphone output

- 3.5 mm TRS jack
- 2 × 300 mW RMS (32 Ω, -40 dB THD, 1 kHz)

Microphone / Instrument / Command input

- 3-pin audio socket

Power supply

- BA 70 rechargeable battery pack

Battery operating time

- up to 7 h (unidirectional microphone use)
- up to 6 h (unidirectional IEM use)
- up to 5 h (bidirectional use)

Dimensions

- approx. 83 x 62 x 21 mm (3.39" x 2.44" x 0.83") (without antenna)

Weight

- approx. 178 g (0.39 lbs) (with BA 70)
- approx. 144 g (0.32 lbs) (without BA 70)

Temperature

- Operation: –10 °C to +50 °C (14 °F to 122 °F)
- Storage: –25 °C to +70 °C –13 °F to 158 °F)

Relative air humidity

- 25 % to 95 % (non-condensing)

DAD

RF transmission power

- up to 100 mW; countrywise limited

RF channels

- 1

Base Station connection

- Ruggedized RJ45 including PoE, max. 100 m cable, CAT5e or better, 1 Gbit/s

Power consumption

- PoE class 2 (< 6.5 W)

Apex angle vertical

- vertical
    - UHF: 65 °
    - 1G4: 62 °
- horizontal
    - UHF: 109 °
    - 1G4: 93 °

Front to back ratio

- UHF: 15 dB
- 1G4: 17 dB

Gain

- UHF: 5 dB
- 1G4: 6.5 dB

Threads for tripod mounting

- Yes / Adapter 3/8" to 5/8"

Dimensions

- UHF: 349 x 292 x 39 mm (13.74" x 11.5" x 1.54")
- 1G4: 231 x 205 x 39 mm (9.09" x 8.07" x 1.54")

Weight

- UHF: 676 g (1.49 lbs)
- 1G4: 534 g (1.18 lbs)

Temperature

- Operation: –10 °C to +50 °C (14 °F to 122 °F)
- Storage: –25 °C to +70 °C –13 °F to 158 °F)

Relative air humidity

- 25 % to 95 % (non-condensing)

IP class

- IP54

CHG 70N-C charger

Power supply

- 12 V DC (single unit or cascade of up to 5 units)
- PoE IEEE 802.3af Class 0 (CAT5e or higher), single unit only

Current consumption

max. 3.5 A for a cascade of up to 5 units

Ethernet

- RJ-45 socket, IEEE802.3
- 100Base-TX (half+full duplex)
- 10Base-T (half+full duplex)

Dimensions

Approx. 200 x 104 x 116 mm

Weight

Approx. 640 g, without power supply unit

Charging slots

2

Charging capacity per slot

- BA 70 rechargeable battery **or**
- EW-DX SK with BA 70 **or**
- EW-DX SKM with BA 70

Charging voltage

4.35 V

Charging current

min. 344 mA

max. 860 mA

Full charging time

Max. 3.5 h

Temperature range

- Charging: -10 °C to +50 °C
- Storage: -20 °C to +70 °C

Relative humidity

Max. 95% (non-condensing)

BA 70 rechargeable battery

Rated capacity

1720 mAh

Nominal voltage

3.8 V

Charging voltage

max. 4.35 V

Charging time

Typically 3 h @ room temperature

Dimensions

Approx. 54 x 30 x 15

Weight

Approx. 33 g

Temperature range

- Charging: 0 °C – +55 °C (32 °F – 131 °F)
- Discharging: -10 °C to +55 °C
- Storage: -10 °C to +45 °C

Relative humidity

- Charging/discharging: 25% to 95%, non-condensing
- Storage: 30% to 70%, non-condensing

L 70 USB charger

Charging capacity

2 Sennheiser BA 70 rechargeable battery packs

Input voltage

Typically 5 V

Input current

max. 2 A

Charging voltage

nominally 4.35 V

Charging current

max. 860 mA per battery pack

Charging time

max. 3.5 h with NT 5-20 UCW power supply unit

Temperature range

- Charging: 0 °C to +55 °C
- Storage: -20 °C to +70 °C

Relative humidity

Max. 95% (non-condensing)

Dimensions

100 × 35 × 70 mm (1 3/4" x 3 7/8" x 7 3/16")

Weight

Approx. 86 g

Modular L 6000 charger

Charging capacity

- Up to 8 rechargeable batteries (BA 60, BA 61, BA 62 and BA 70) across 4 exchangeable charging modules (LM 6060, LM 6061, LM 6062 and LM 6070)

Charging times at 20° C

- BA 60
    - 80%: approx. 1:15 h (approx. 4:45 h operating time)
    - Full: approx. 2:30 h
- BA 61
    - 80%: approx. 1:45 h (approx. 5:00 h operating time)
    - Full: approx. 3:15 h
- BA 62
    - 80%: approx. 1:15 h (approx. 9:30 h operating time)
    - Full: approx. 2:45 h
- BA 70
    - 80%: approx. 1:45 h
    - Full: approx. 3:30 h

Charging temperature range

- 0 to 50 °C (32 °F to 122 °F)

Charging status display

- Multi-colored

Network

- IEEE 802.3-2002 (10/100 Mbit/s), shielded RJ-45 connection

Power supply

- AC 100 – 240 V, 50/60 Hz

Maximum power consumption

- 85 W

Minimum power consumption

- 1 W

Power plug

- 3-pin, protection class I as per IEC/EN 60320-1

Dimensions (H × W × D with mounting elements)

- 44 x 483 x 373 mm

Weight

- 5.1 kg

LM 6060 | LM 6061 | LM 6062 | LM 6070 charging modules

Dimensions (H × W × L)

- 44 x 99 x 182 mm

Weight

- 144 g

Rechargeable battery type

- LM 6060: 2× BA 60
- LM 6061: 2× BA 61
- LM 6062: 2× BA 62
- LM 6070: 2× BA 70

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