



# SPECTERA Base Station



The Spectera Base Station is a 1 U hardware device that provides up to 64 channels (32 in / 32 out) and utilizes up to two wideband RF channels to accommodate all wireless transmission of the unit. It features redundant Dante® and optional redundant MADI, ensuring seamless integration into your audio network. Additional antennas can be added for redundancy, extended zone coverage, or additional spectrum capacity.

## FEATURES

- 19" 1 U Base Station with redundant power supplies
- Provides up to 64 audio channels (32 in / 32 out) and allows for up to two independent wideband RF channels in UHF or 1G4 (6 or 8 MHz) – country specific per region license
- 4 RJ45 antenna ports for redundancy, extended zone coverage, and additional spectrum usage
- Redundant Dante® audio interface
- Two slots for redundant MADI (optional, OM or BNC)
- Sample rates of 48 kHz and 96 kHz
- Individual sample rate converters for all audio interfaces
- Wordclock I/O BNC
- Synchronized clock for all audio over RF allows 3D recordings and playback
- Adjustable RF power from 10 – 100 mW (country specific)
- RJ45 network interface for full remote control
- 11 Audio link modes with selectable audio codecs (OPUS, SeDAC or PCM)
- Secure transmission of confidential content using AES 256 encryption
- Future expansion via cascade port
- Selectable headphone output with volume control on front panel
- OLED display, jog wheel navigation, and rugged metal housing
- Base Station activation via LinkDesk or WebUI: Spectera license defines system functionality and respective frequency spectrum per region (license sold separately)

## DELIVERY INCLUDES

- Base Station
- Power cables with country specific plugs (EU, UK, US)
- Quick guide
- Safety guide
- Manufacturer declaration sheet

## PRODUCT VARIANTS

**SPECTERA Base Station** Art. no. 509162

## ACCESSORIES

|                                 |  |                 |
|---------------------------------|--|-----------------|
| <b>SPECTERA MADI Card (BNC)</b> | MADI Card Coaxial for Base Station           | Art. no. 509293 |
| <b>SPECTERA MADI Card (OM)</b>  | MADI Card Optical multimode for Base Station | Art. no. 509295 |
| <b>SPECTERA Filter set</b>      | Exchangeable filter for Base Station         | Art. no. 700073 |



# SPECTERA Base Station



## SYSTEM LICENSES

| Name                   | Art. no. | Frequency range   | Certified Countries*                         |
|------------------------|----------|---|--|
| SPECTERA LIC (ZONE 01) | 700532   | UHF (470 - 608 MHz, 630 - 698 MHz)<br>1G4 (1350 - 1400 MHz)                               | EU + EFTA, United Kingdom,<br>Turkey         |
| SPECTERA LIC (ZONE 02) | 700533   | UHF (470 - 608 MHz, 657 - 663 MHz)<br>1G4 (1435 - 1525 MHz <b>Certification pending</b> ) | USA  |
| SPECTERA LIC (ZONE 03) | 700534   | UHF (470 - 608 MHz, 657 - 663 MHz)  | Canada                                       |
| SPECTERA LIC (ZONE 04) | 700535   | UHF (470 - 534 MHz, 534 - 608 MHz,<br>630 - 698 MHz)                                      | Singapore                                    |
| SPECTERA LIC (ZONE 05) | 700536   | UHF (470 - 608 MHz, 630 - 698 MHz)<br>1G4 (1350 - 1400 MHz)                               | South Africa<br><b>Certification pending</b> |
| SPECTERA LIC (ZONE 06) | 700537   | UHF (470 - 608 MHz, 630 - 694 MHz)  | Malaysia, Qatar                              |
| SPECTERA LIC (ZONE 07) | 700538   | UHF (470 - 510 MHz)   | Israel - <b>Certification pending</b>        |
| SPECTERA LIC (ZONE 08) | 700539   | UHF (487 - 608 MHz, 630 - 694 MHz)  | Indonesia                                    |
| SPECTERA LIC (ZONE 09) | 700540   | UHF (470 - 608 MHz, 630 - 694 MHz)<br>1G4 (1350 - 1400 MHz)                               | United Arab Emirates                         |
| SPECTERA LIC (ZONE 10) | 700541   | UHF (470 - 608 MHz, 630 - 698 MHz)  | Philippines                                  |
| SPECTERA LIC (ZONE 11) | 700542   | UHF (520 - 608 MHz, 630 - 694 MHz)  | Australia                                    |
| SPECTERA LIC (ZONE 12) | 700543   | UHF (510 - 606 MHz)   | New Zealand                                  |
| SPECTERA LIC (ZONE 13) | 700544   | 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.



# SPECTERA

## Base Station

### SPECIFICATIONS

#### System

|                          |   |
|--------------------------|---|
| Transmission scheme      | Multicarrier, TDMA, TDD   |
| RF channel               | Bandwidth: 6 or 8 MHz countrywise limited<br>Mobiles devices: up to 128 per RF channel<br>Audio links: up to 128 per RF channel |
| Radio frequency range    | UHF: 470 - 608 MHz, 630 - 698 MHz<br>1G4: 1350 - 1400 MHz, 1435 - 1525 MHz<br>countrywise limited                               |
| Audio frequency response | 20 Hz to 20,000 Hz ( $\pm 1$ dB) (Audio link modes with audio codecs SeDAC and PCM 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 | Latency | Range    |
|------------------------|-----------------|--------------------------|--------------------------|-------------|---------|----------|
| Raw Low Latency        | Mono            | 8                        | 12.50 %                  | PCM         | 1.0 ms  | Reduced  |
| Raw                    | Mono            | 16                       | 6.25 %                   | PCM         | 1.6 ms  | Reduced  |
| Live Low Latency       | Mono            | 8                        | 12.50 %                  | SeDAC       | 1.0 ms  | Extended |
| Live                   | Mono            | 16                       | 6.25 %                   | SeDAC       | 1.6 ms  | Extended |
| Live Link Density      | Mono            | 32                       | 3.13 %                   | SeDAC       | 2.7 ms  | Standard |
| Max Range              | Mono            | 16                       | 6.25 %                   | OPUS        | 9.9 ms  | Maximum  |
| Max Link density       | Mono            | 128*                     | 0.78 %                   | OPUS        | 15.2 ms | Reduced  |
| IEM/IFB                | Mono/<br>Stereo | Max links per RF carrier | Utilized % of RF carrier | Audio codec | Latency | Range    |
| Live                   | Mono            | 16                       | 6.25 %                   | SeDAC       | 1.6 ms  | Extended |
| Live Link Density      | Mono            | 32                       | 3.13 %                   | SeDAC       | 2.7 ms  | Standard |
| Max Range              | Mono            | 16                       | 6.25 %                   | OPUS        | 9.9 ms  | Maximum  |
| Max Link density       | Mono            | 128*                     | 0.78 %                   | OPUS        | 15.2 ms | Reduced  |
| Live Ultra Low Latency | Stereo          | 4 (8 ch)                 | 25 %                     | SeDAC       | 0.7 ms  | Extended |
| Live Low Latency       | Stereo          | 8 (16 ch)                | 12.50 %                  | SeDAC       | 1.1 ms  | Extended |
| Live                   | Stereo          | 16 (32 ch)               | 6.25 %                   | SeDAC       | 1.6 ms  | Standard |
| Live Link Density      | Stereo          | 32 (64 ch)**             | 3.13 %                   | SeDAC       | 2.7 ms  | Reduced  |

\* 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)



# SPECTERA

## Base Station

### SPECTERA Base Station

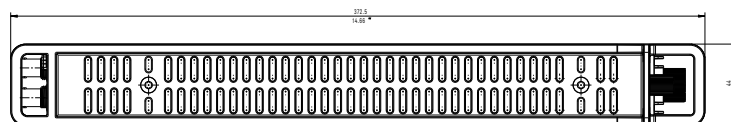
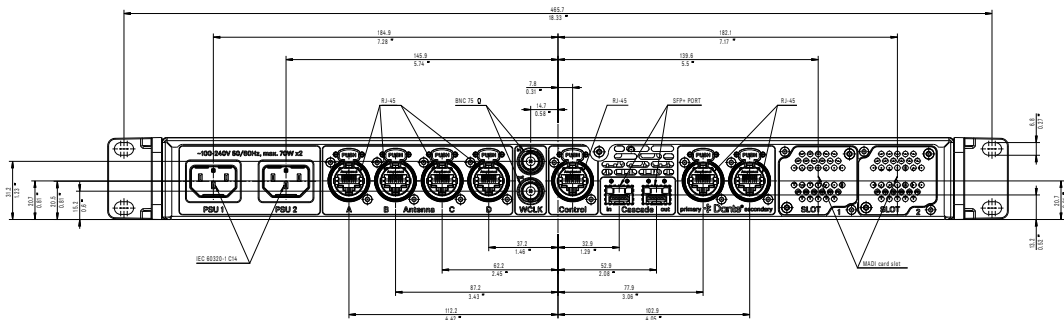
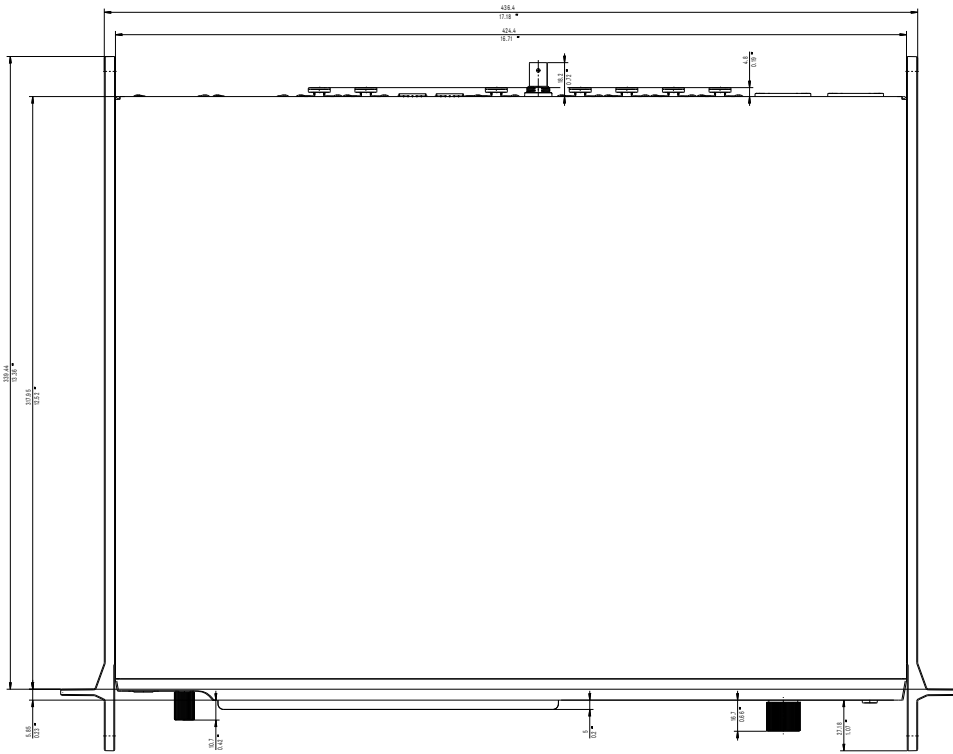
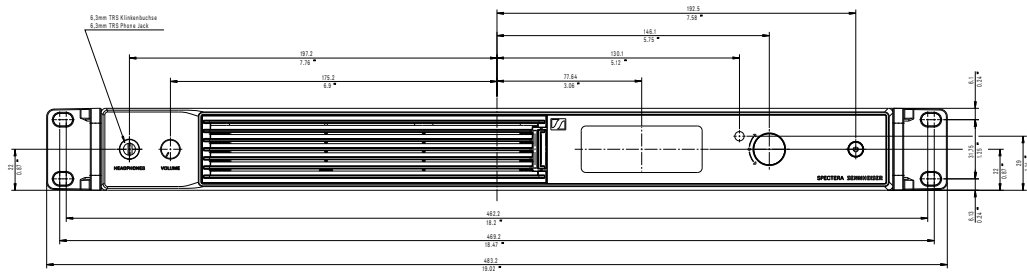
|   |  |
|---|--|
| RF channels                                   | 2  |
| Audio inputs and outputs                      | Input: up to 32 channels<br>Output: up to 32 channels<br>individually selectable from digital audio interfaces   |
| Digital audio interfaces                      | Dante®<br>Ethernet, 1 Gbit/s<br>2× ruggedized RJ45 (Primary and Secondary)<br>32 In, 32 Out, 48 kHz or 96 kHz, 16/24/32 bit<br>MADI (AES10)<br>2× Expansion Slots for MADI Card OM (optical fiber multimode) or MADI Card BNC<br>(separate accessories)<br>32 In, 32 Out, 48 kHz or 96 kHz, 16/24 bit<br>Individual sample rate for each interface |
| Headphone output                              | 6.3 mm TRS jack,<br>2 × 50 mW RMS (32 Ω, -40 dB THD, 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: BNC, 75 Ω<br>Output: BNC, 75 Ω<br>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 × internal redundant<br>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)<br>Storage: -25 °C to +70 °C (-13 °F to 158 °F)  |
| Relative 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)



# SPECTERA Base Station

## DIMENSIONS





# SPECTERA

## Base Station

### ARCHITECT'S SPECIFICATION

#### **Sennheiser Spectera/ System description / Intro text**

Digital bidirectional (uplink/ downlink) multicarrier/ TDMA/ TDD wireless system for simultaneous transmission of up to 32 audio input and output channels. The system shall use digital broadband transmission technology for this purpose. It shall be based on wireless multichannel audio systems technology (WMAS) and its combination of modulation and multiplexing methods.

Data and audio transmission, as well as remote control and monitoring data, shall be carried out via a single RF carrier, avoiding the 2.4 ISM band.

The system shall operate in the TV UHF band or the 1.4/1.5 GHz band. It shall operate with an RF channel bandwidth of 6 or 8 MHz and shall pair up to 128 mobile devices per RF channel.

It shall provide a switching bandwidth of 194 MHz (UHF) or 128 MHz (1.4 GHz), which shall be identical for all RF components in the system; the base station shall be frequency-independent and both frequency bands shall be operated simultaneously by a single base station.

The system shall consist of the following components:

- Base Station in 19"/1U format (shall allow up to two independent wideband RF carriers in UHF or 1G4 band). The base station shall process only digital audio signals without any analog components (compander, RF emphasis, etc.).
- Bodypacks for simultaneous use as both in-ear monitoring receiver and transmitter for microphone/line audio signals.
- Digital bidirectional antenna with integrated RF components (up to four pieces shall be used simultaneously).
- Proprietary desktop application for comprehensive system management.
- Handheld microphone (in development).

The system can be operated with only one antenna. Up to four antennas can be connected to a single base station and operated in multi-zone mode with improved antenna coverage and optimized signal-to-noise ratio. The connection between the base station and antennas shall be a digital 1 Gb/s connection via a CAT5e (or higher) cable with a maximum length of 100 m.

For all system components, data and audio shall be transmitted via a single RF carrier. The system shall support up to 128 audio channels per RF channel, with each channel individually configurable (audio codec, latency, operating range).

The audio frequency response of the system shall be 20 Hz to 20,000 Hz, the system latency shall be min. 0.7 ms for stereo audio links/ 1 ms for mono audio links. The system shall offer 11 audio link/transmission modes, including a mode for linear PCM format. Each channel can be operated in a different mode; Modes can be changed at any time and without rebooting. The internal audio processing shall be done in 32-bit float format.

100 – 240 V power supply units, Dante and optional MAD1 connectors shall be redundant; a total of up to four antennas can be operated simultaneously.

The system shall have AES 256 end-to-end encryption.

The system shall be remotely controlled and monitored via Windows, macOS native software and a WebUI.

The system shall comply with all relevant international standards and regulations for wireless audio transmission. It shall be certified for use in a wide variety of regions (including the EU, USA and Canada).



# SPECTERA

## Base Station

### Digital Bidirectional Base Station (Sennheiser Spectera Base Station)

Digital bidirectional 19"/ 1U base station with up to 32 individually selectable audio inputs and outputs/ 64 audio links with 11 audio link modes with selectable audio codecs and PCM for wireless transmission of audio and control data on up to two HF broadband channels (6/ 8 MHz) in the UHF or 1G4 range to match the wireless system described in the system description.

The base station shall be equipped with a 3 x 32 input/32 output audio matrix with an integrated Dante module that shall support redundant Dante (32 x 32 audio channels, AES67); it shall operate at a sampling rate of 48/96 kHz, and each audio interface shall have an individual sampling rate converter. The configured audio links shall be listened to via the headphone output.

The base station shall process only digital audio signals without any analog components (componder, RF emphasis, etc.).

A digital antenna connected for this purpose shall allow it to operate as a continuous broadband spectrum analyzer, while other connected antennas shall continue to transmit IEM, IFB and microphone signals at the same time. The antenna connections shall also be used for multi-zone distribution and range extension.

The base station shall have two redundant 100 – 240 V power supply units, a redundant Dante interface (primary/secondary), two expansion slots for redundant MADI interfaces (BNC, SC-Duplex, AES10) and four RJ45 antenna connectors. Furthermore, the base station shall have an independent RJ45 Ethernet port for remote control and monitoring of the device, which shall be physically isolated from the Audio-over-IP (AoIP) network.

### Technical requirements

#### Specifications:

- RF Channels: 2 (6 or 8 MHz)
- Audio connections: up to 128 mobile channels per RF channel
- Audio I/O: up to 32 inputs and outputs/ 64 audio links
- RF output power: 10 mW – 100 mW, adjustable
- Encryption: AES 256
- Audio frequency response: 20 Hz – 20,000 Hz

#### Connections, displays & controls on the front:

- 1 x 6.3mm Headphones (2 × 50 mW RMS @ 32 Ω)
- 1 x Encoder Headphone Volume
- 1 x OLED-Display
- 1 x Jog-Wheel

#### Connections on the back:

- 4 x RJ45 Antenna
- 2 x RJ45 Dante (primary/ secondary)
- 1 x RJ45 Control/ Remote Control
- 2 x BNC Wordclock in/ out
- 2 x SFP+ Cascade (I/O)
- 2 x IEC PSU
- 2 x MADI Expansion Slot

#### Physical Properties:

- Maße: 19" x 1U X 373 mm
- Weight: approx. 6.3 kg
- Material: Metal
- Operating temperature: approx. -10 °C to +50 °C
- Relative humidity: 25% - 95%
- Power supply: 100 to 240 V AC, 50/60 Hz
- Power consumption: 70 W

Base station shall include power cord and all necessary small parts.