The function is triggered depending on the view where it is configured.

Functions in the view...

- **Always-On** are permanently activated.
- **Trigger** are switched by a trigger.
- **On-Talk** are automatically activated if it is talked in the respective channel.
- **On-Notification/Beep** are automatically activated if the respective channel receives a notification/beep.
- **On-Vox** are activated when and as long as the VOX is triggered.
  (The parameters for VOX activation are configurable on the page 'General'.)

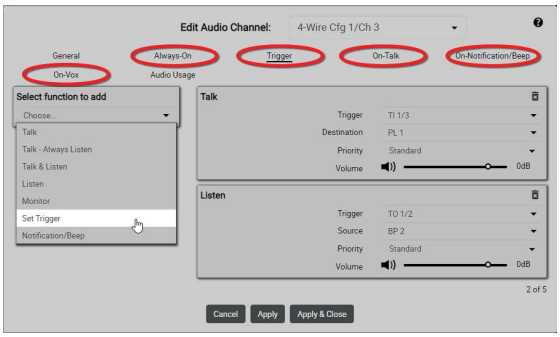


Figure 117: edit audio channel – Trigger

The page **Beltpacks** allows programming the Beltpacks key functions individually.

- Click the ✎ button to configure the respective Beltpack.

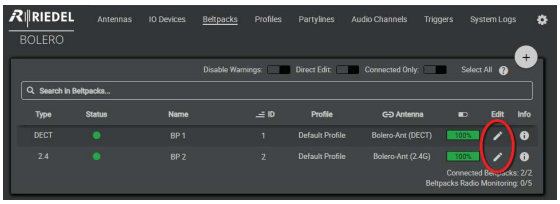


Figure 118: Registered Beltpacks

> Use the **Profiles** page to configure all Beltpacks assigned to the profile in one step.
> (⇨Profiles (User Rights))

In the **Keys** section the keys of the Beltpack can be configured and functions can be assigned.

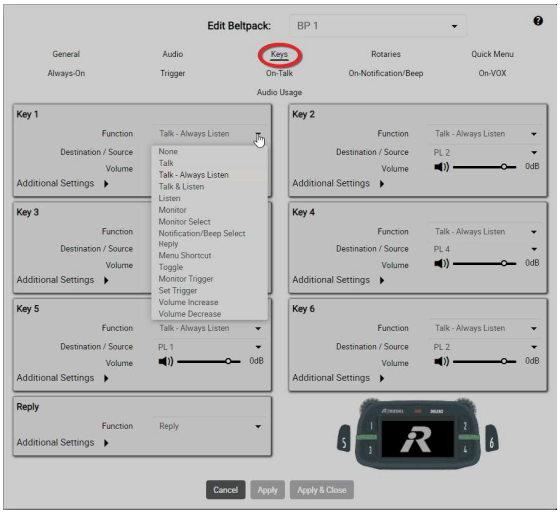


Figure 119: edit Beltpacks – Keys

After this configuration the Beltpacks are able to communicate to other Beltpacks as well as to the audio channels of the IO devices.

2.5 Add Devices

To add more Antennas to a working **Network Space**, the new Antennas must not be assigned to any other Net. If a new Antenna is already assigned to a Net, see chapter '**Remove Devices** > Antennas' to remove it from the current Net before proceeding the registration.

	New Antennas have disabled radio, if the Antenna is not known by the matrix.

- Connect the Antenna's 'AES67/Config' port to the network switch. If a PoE+ switch is used, the Antenna is also supplied with power.
- Alternatively, attach a separate DC power supply to the Antenna's power connector.

The IP address of the Antenna is shown in the bottom right of the display (e.g. 192.168.41.151).

Figure 120: Antenna Display

Open the web interface of the Antenna to access the configuration:

- Enter the IP address of a Bolero Antenna in the Web-Browser (e.g. 192.168.41.151).

Figure 121: Web interface of the Antenna

	Take care that the Antennas IP address is in the same IP range as the existing Net. The IP settings can be modified in the web interface ( ) as well as in the Antennas' menu (**IP Settings**).

- Select the unassigned Antenna(s) to be added to an existing **Network Space**.

Selected elements will be highlighted.

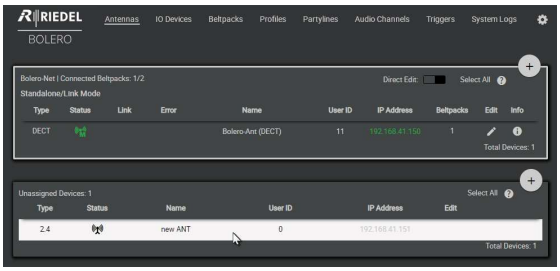


Figure 122: Selected new Antennas

- Click on the plus symbol off the unassigned Antenna(s) and select the entry '**Add Selected Antennas to Network Space...**'.

A dialog is opened to select the Net.

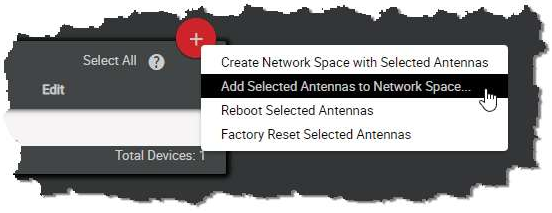


Figure 123: Add to Network Space

- Select in the drop-down menu an existing **Network Space**.
- Click the **Apply** button.

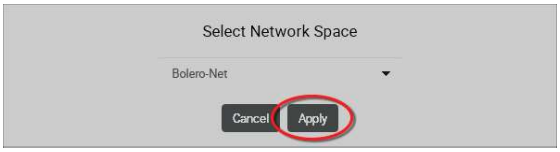


Figure 124: Dialog – Select Network Space

This example shows the new added Antenna in the existing Network Space **Bolero-Net**.

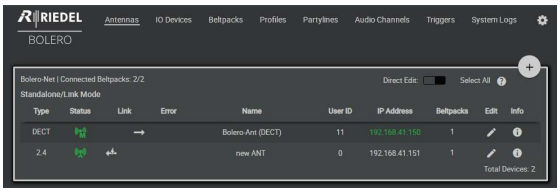


Figure 125: Added new Antenna in the Bolero-Net

Do not forget to assign a unique User ID and a name to the new Antenna.

- Click the Edit icon of the new Antenna.
- Click the **Apply** button.

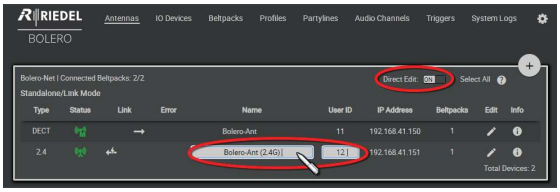


Figure 126: Apply unique User ID

In this example the Network Space consists now of two Antennas.

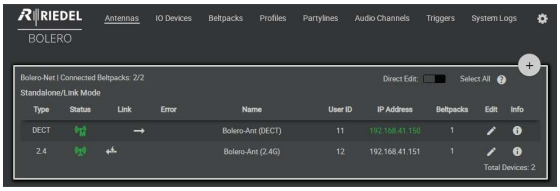


Figure 127: Devices in the Bolero-Net

2.6 Remove Devices

In the Web Interface it is possible to remove registered Antennas as well as registered Beltpacks from a Net.

2.6.1 Antennas

To de-register Antennas from a Net, choose the register '**Antennas**'.
Then select the desired Antennas.

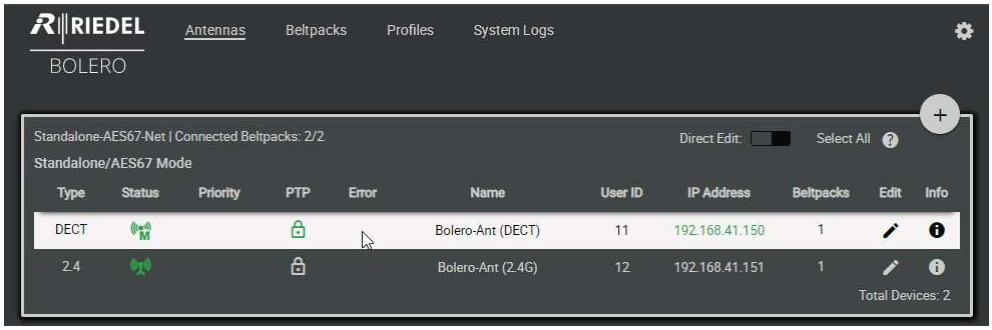


Figure 128: Web Interface – Antennas

Click on the plus symbol and select the item '**Remove Selected Antennas**'.

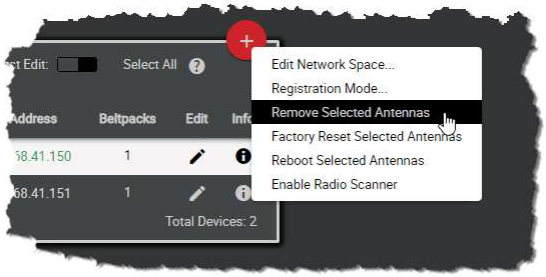


Figure 129: Remove Selected Antennas

Confirm the opened dialog by clicking '**Ok**'.

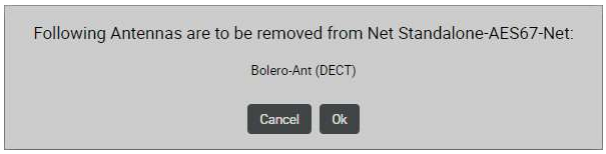


Figure 130: Confirmation dialog

The Antennas will be removed immediately from the Net.

2.6.2 Beltpacks

To de-register Beltpacks from a Net, choose the register '**Beltpacks**'.
Then select the desired Beltpacks.

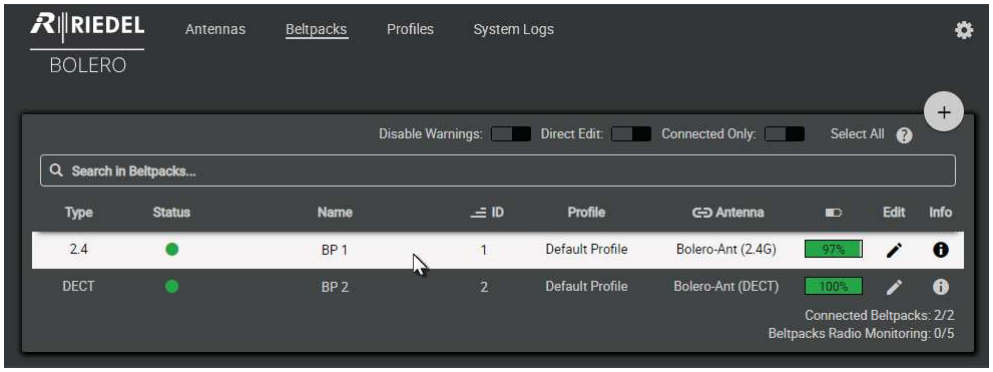


Figure 131: Web Interface – Registered Beltpacks

Click on the plus symbol and select the menu item '**Deregister**'.

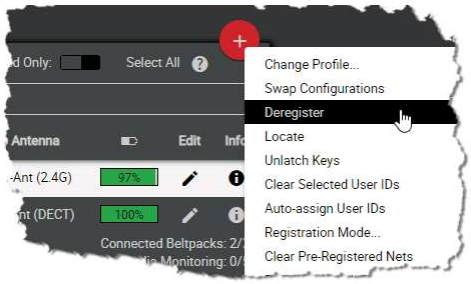


Figure 132: Deregister

Confirm the opened dialog by clicking '**Ok**'.

Figure 133: Confirmation dialog

The Beltpacks will be removed immediately from the Net.

2.7 Firmware Update

Upgrading From Earlier Versions
The Network Space configuration and the Antenna configuration is preserved when updating from version 1.0.x/1.1.x/1.2.x/2.0.x. Configurations saved with version 1.0.x/1.1.x/1.2.x/2.0.x can be loaded in version 2.1.1. As final step of the update, all devices are rebooted. Please refresh your browser tab when the connection is re-established to conclude the update.

Updating From Version 1.x.x
If you plan to use Standalone/Link mode with Link-Power, you should update the system from version 1.x.x while the antennas are powered via XLR. Before an antenna can be powered via Link-Power or deliver power over the links after an update, it must be powered by XLR for at least a couple of minutes (to complete the update of the remote power controller firmware).

Updating From Version 1.0.x
Bolero Antennas running version 1.0.x have to be updated twice to this version. After a successful update you will see the package version 2.1.1 in the "Current Firmware" column of the Firmware Manager.

Downgrading From This Version
When downgrading to a previous version, the Network Space, Antenna configurations, and the IP address settings will be lost. Note that the Network Space name may be empty and the admin pin may be set to "1234" after a downgrade to version 1.0.x/1.1.x. Saved configurations of this version cannot be loaded on previous versions.

This chapter describes the update procedure of Bolero Antennas. Depending on the system mode, following devices are required:

	Standalone AES67 Mode	Standalone Link Mode	Integrated Artist Mode
PC	✓	✓	✓
Bolero firmware package (for example "bolero_v1.2.3-456.package")	✓	✓	✓
Network Switch (optionally with PoE+ functionality)	✓	✗	✓
Bolero-Antennas	✓	✓	✓

Standalone/AES67 Mode & Integrated/Artist Mode:
- Attach the PC to the network switch.
- Attach the 'AES67/Config' connector of the Bolero-Antennas to the network switch.
  If the Antennas are connected to a 'PoE+' switch, they are also powered via the switch.
- Otherwise power the Antennas via external DC power supplies.

Standalone/Link Mode:
- Attach the 'AES67/Config' connector of one Bolero-Antenna to the PC.
- Cascade further Antennas via the Link connectors (Link-1 to Link-2, and vice-versa).
- Power the Antennas via external DC power supplies.
- Otherwise power the middle Antenna (of up to five daisy-chained Antennas) via BL-EPS-1005 power supply.

After the Antennas' bootup is finished, the respective IP address is displayed in the bottom right of the Antennas display (for example 192.168.41.150).

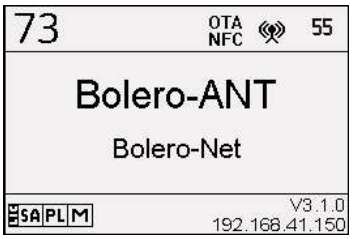


Figure 134: Antenna display

Open the web interface of an Antenna:

- Enter the IP address in the web browser (e.g. 192.168.41.150).

Figure 135: Web interface of the Antenna

- Click on the ⚙ settings icon and select the entry **Firmware Manager**.

Figure 136: Firmware Manager

A dialog is opened to enter the **Admin-PIN** of the Net.

- Enter the **Admin PIN** that was defined when the Network Space was created.

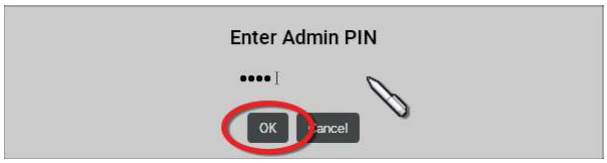


Figure 137: Dialog – Admin PIN

The Firmware Manager is opened.

- Click on the '**Choose File**' button.
- Navigate to the location of the firmware package and select the desired one by clicking the **Open** button.

In this example the Bolero Network Space consists of two Antennas.

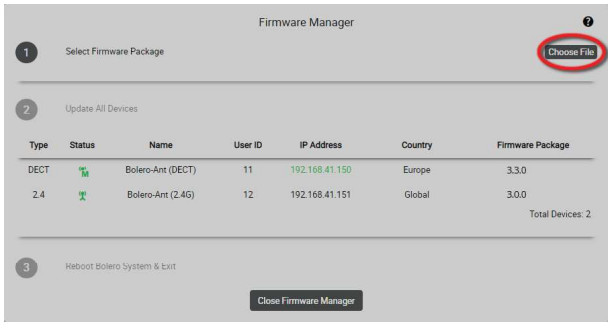


Figure 138: Firmware-Manager – Select Firmware Image

The firmware package is transferred to the Bolero system.
A bar graph visualizes the upload progress.

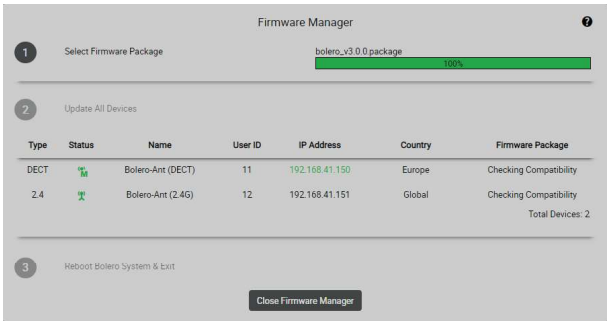


Figure 139: Firmware-Manager – Upload to Network Space

If '**Incompatible**' is displayed for an Antenna after the upload, the selected firmware package is not compatible. The update will not be installed on this device.

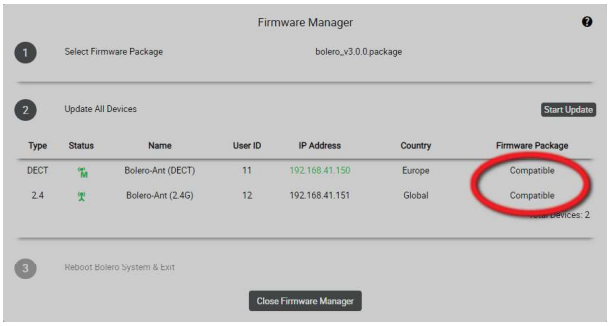


Figure 140: Firmware-Manager – Compatible Firmware-Package

- All **compatible** devices will be updated by clicking the '**Start Update**' button.

	Audio and radio interruptions will occur from this point on.

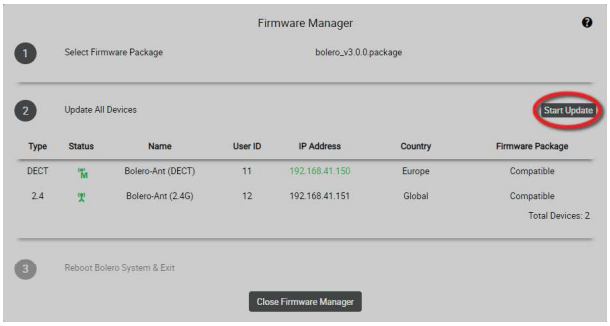


Figure 141: Firmware-Manager – Start Update

A dialog is opened to confirm the update of all compatible devices.

- Click the **Apply** button to proceed.

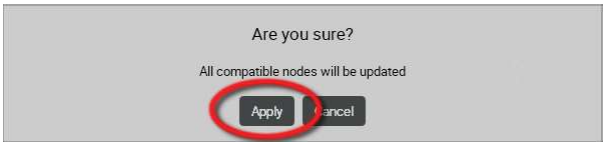


Figure 142: Firmware-Manager – Confirmation

Bar graphs visualize the update progress.

Caution: Do not remove the power from any devices.

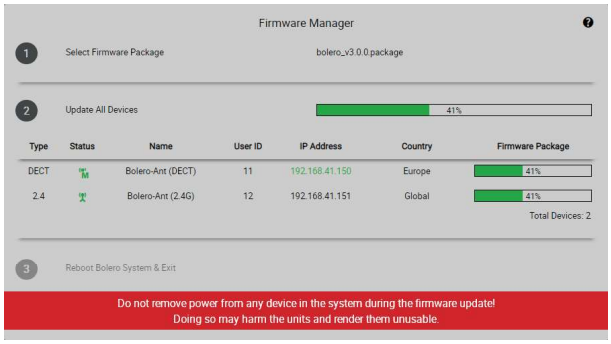


Figure 143: Firmware-Manager – progress

All devices must be rebooted to finish the update process.

- Click the '**Finish & Reboot System**' button.

The connection to the Antenna will be interrupted while the device is rebooting.

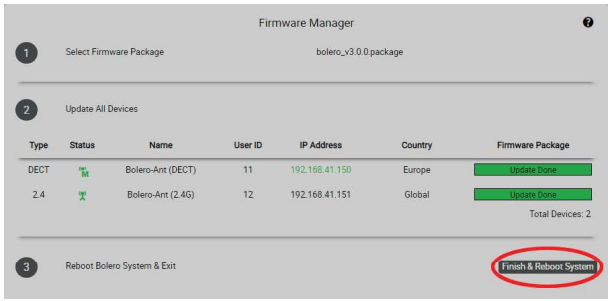


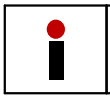
Figure 144: Firmware-Manager – Reboot devices

2.8 Advanced Radio Monitoring

DECT-Antennas as well as DECT-Beltpacks can be used to scan or monitor the radio spectrum utilized by DECT devices. This can be used to diagnose radio issues as well as help in planning system expansions.
Note that an 'Advanced Monitoring' license is required on at least one Antenna in the Network Space to use this feature. The Antenna display shows an AM icon in the bottom left corner on each Antenna with the Advanced Monitoring license, in combination with other icons for other licenses installed on the Antenna. New license files obtained from Riedel can be installed using the License Manager view in the Web Interface (⇨License Manager).

2.8.1 Antenna Radio Scanner

The advanced radio monitoring app enables Bolero Antennas in the network to scan the DECT environment. Antennas in the network can switch to a Radio Scanner mode when at least one antenna in the network holds the Advanced Monitoring license (AM).
An antenna in scanner mode will analyze the radio spectrum. The scan evaluates how many timeslots are interfered or used by the Bolero net. In addition, the radio scanner is looking for other Bolero and third party systems in the air.
To be able to use an Antenna in a Network Space as '**Radio Scanner**', it must be selected in the Web Interface antenna list and using the '**Enable Radio Scanner**' entry in the action menu (⇨Action Button (Antennas)).

	In radio scanner mode the Antenna is not available for Beltpacks anymore and all Beltpacks connected before will be disconnected.

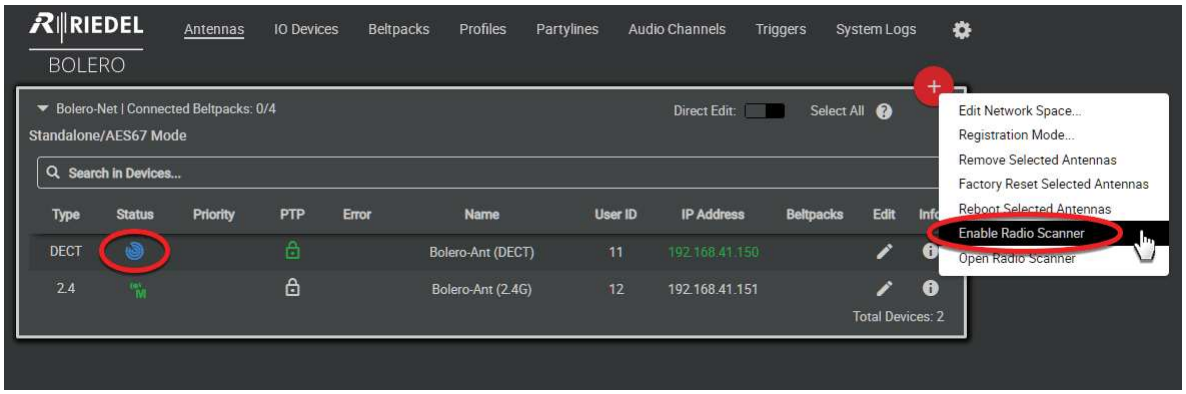


Figure 145: Web-Interface – Antennas (Enable Radio Scanner)

The gathered data (timeslot usage, detected systems, etc.) can be viewed in the Web Interface in the **Antennas** view if data has been recorded and is available:

New in 3.1 Action Button (Antennas)
(⇨ 'Features in Detail > Web Interface > Antennas > Action Button (Antennas): Open Radio Scanner')

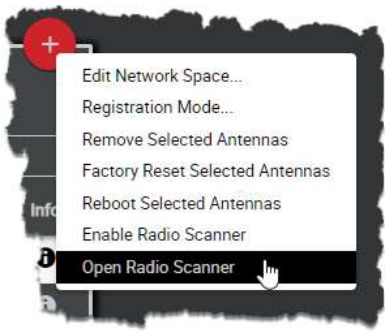


Figure 146: Web-Interface – Antennas (Open Radio Scanner)

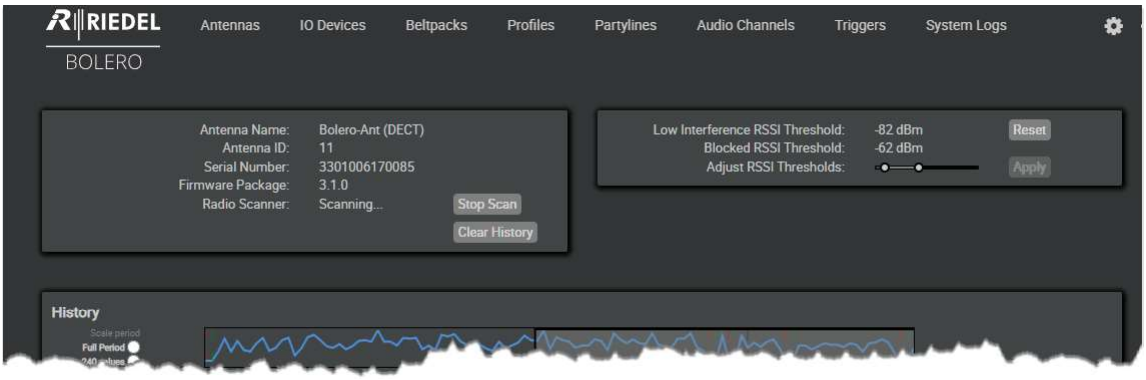


Figure 147: Antenna Radio Scanner

Antenna Name	Name of the Antenna.	
Antenna ID	Unique ID of the Antenna.	
Serial Number	Serial number of the Antenna.	
Firmware Package	Package version of the Antenna.	
Radio Scanner	**Off / Scanning...**	Shows the current state of the Radio Scanner
	Start Scan	Starts a new scan. The data of an existing scan will not be deleted.
	Stop Scan	Stops a scan in progress.
	Clear History	All data stored in this Antenna will be deleted after confirmation. The Admin PIN is required to delete the data.
RSSI Thresholds		Slider to adjust RSSI thresholds used to classify time slots as "Blocked" or "Light Interfered".
	Reset	Resets the values to the default setting. (-82 / -62 dBm)
	Apply	Adopts the changed values.

The most recent data entries are permanently stored on the Antenna until manually cleared via the Web Interface, i.e. the Radio Scanner results are available even after an Antenna reboot.

The measurement data are displayed in the two sections **History** and **Snapshot**:

History section

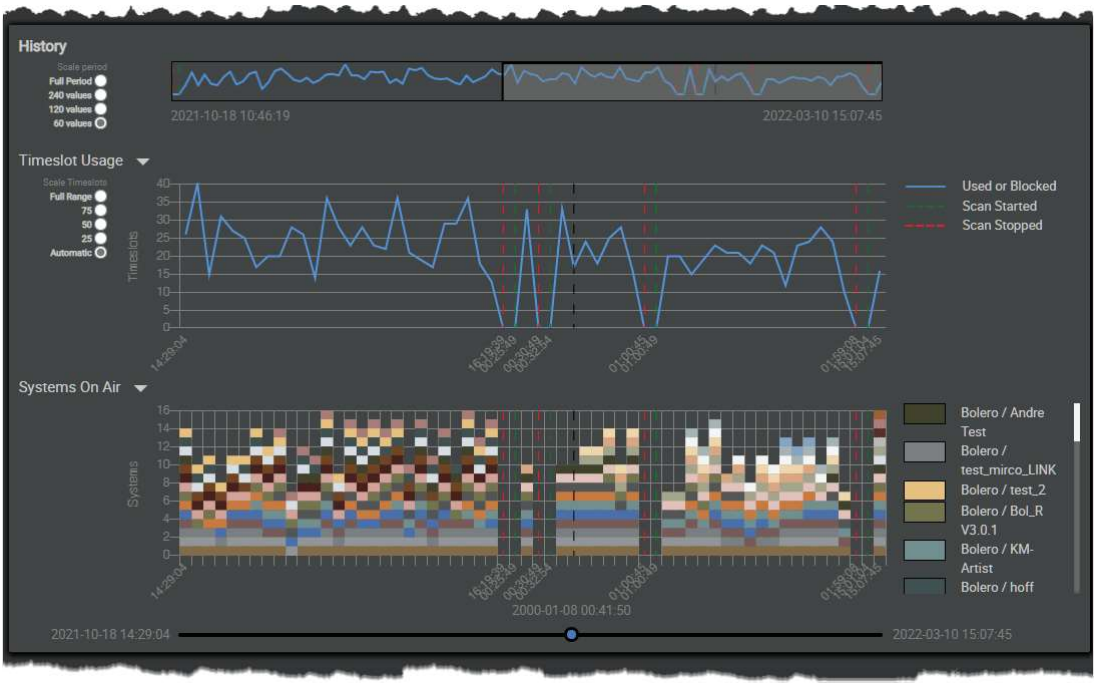


Figure 148: Antenna Radio Scanner (History Section)

The upper diagram shows the period for which collected data is available.
For large time periods, you can use the **Scale period** radio buttons to set whether 480, 240, 120 or 60 values should be displayed.

The middle diagram **Timeslot Usage** shows the logged timeslots used in the radio spectrum.
Country dependent the total amount of available timeslots varies between 40 and 120.
With the radio buttons '**Scale Timeslots**' the vertical resolution (number of displayed timeslots) of the diagram can be adjusted (**Full Range, 75/50/25, Automatic**).

The lower diagram **Systems On Air** shows all simultaneously operating DECT systems within the radio range of the Antenna. Each detected device has a color and is indicated by a box at the corresponding position in the diagram. On the right side all devices detected in the period are listed with their corresponding color.

The Antenna will do one scan approximately every minute and stores up to three days of data.

With the slider below it is possible to select an earlier time and to check the history information in detail.

Snapshot section

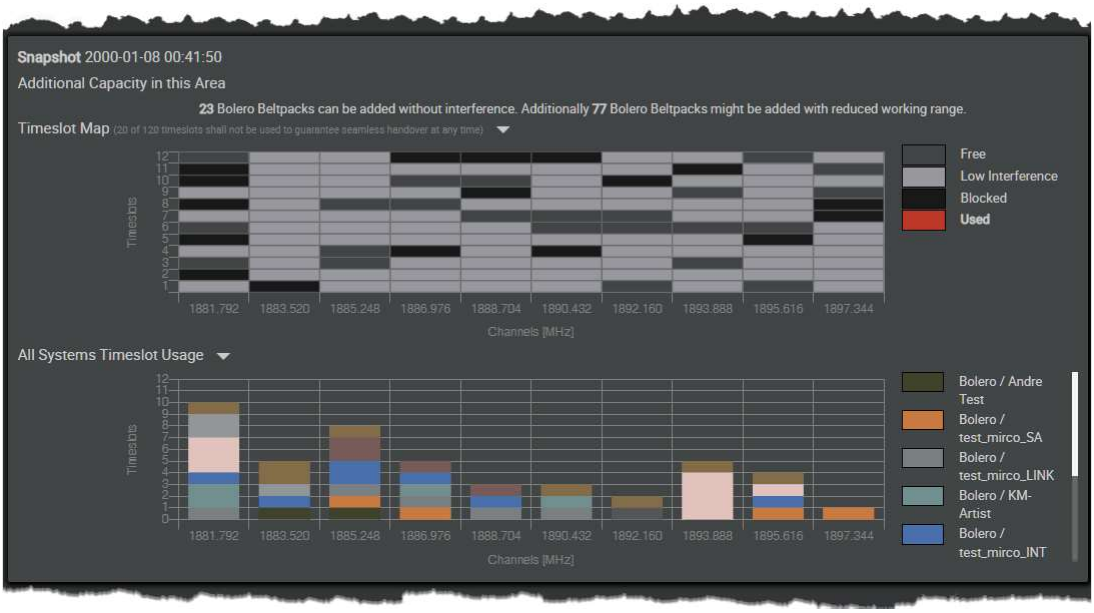


Figure 149: Antenna Radio Scanner (Snapshot Section)

The '**Snapshot**' section shows all available carrier frequencies and timeslots. It gives an idea about additional capacity within the Antenna's radio area.
There are 12 timeslots available per carrier. For operation a Bolero Beltpack uses one timeslot.

The upper diagram **Timeslot Map** shows detailed information about used and interfered timeslots.

The lower diagram **All Systems Timeslot Usage** shows which frequencies are used by the Bolero network space or interfered by different systems.

2.8.2 Beltpack Radio Monitoring

The advanced radio monitoring app enables Bolero Beltpacks in the network space to monitor the DECT environment. Beltpacks are monitoring the environment continuously in the background when at least one antenna in the network space holds the Advanced Monitoring license (EM).
Up to five Bolero Beltpacks in the network space can operate in this detailed Radio Monitoring mode.
To be able to use a Beltpack in a Network Space as '**Radio Monitor**', it must be selected in the Web Interface Beltpack list and using the '**Enable Beltpack Radio Monitoring**' entry in the action menu (⇨Action-Button (Beltpacks)).

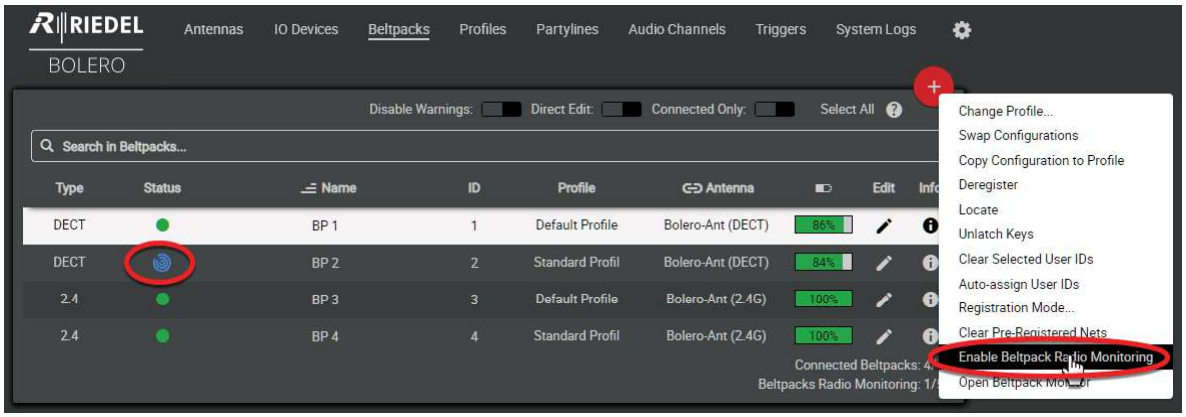


Figure 150: Web-Interface – Beltpacks (Enable Radio Monitoring)

The gathered data (timeslot usage, detected systems, etc.) can be viewed in the Web Interface in the **Beltpacks** view, even if the Beltpack is currently not connected:

New in 3.1 Action Button (Beltpacks)
(⇨ 'Features in Detail > Web Interface > Beltpacks > Action Button (Beltpacks): Open Beltpack Monitor')

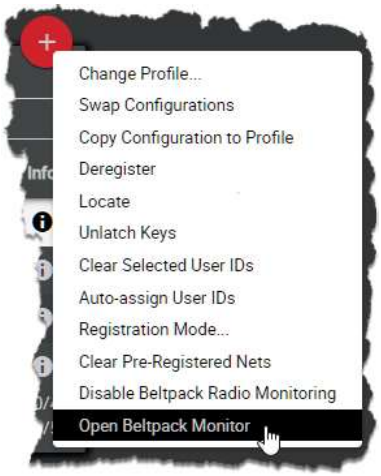


Figure 151: Web-Interface – Beltpacks (Open Radio Monitoring)

Figure 152: Beltpack Radio Monitoring

Beltpack Name	Name of the Beltpack.	
Beltpack Radio Monitoring	**Off / Scanning...**	Shows the current state of the Radio Monitoring.
	Start Scan	Starts a new scan. The data of an existing scan will not be deleted.
	Stop Scan	Stops a scan in progress.
	Clear History	All data stored in this Beltpack will be deleted after confirmation. The Admin PIN is required to delete the data.
RSSI Thresholds		Slider to adjust RSSI thresholds used to classify time slots as "Blocked" or "Light Interfered".
	Reset	Resets the values to the default setting. (-82 / -62 dBm)
	Apply	Adopts the changed values.

The measurements are not stored permanently on the Antenna or Beltpack but is only maintained in the currently active radio master Antenna, i.e. previous Beltpack monitoring data is discarded when a different Antenna becomes radio master or the radio master Antenna is turned off.

The measurement data are displayed in the two sections **History** and **Snapshot**:

History section

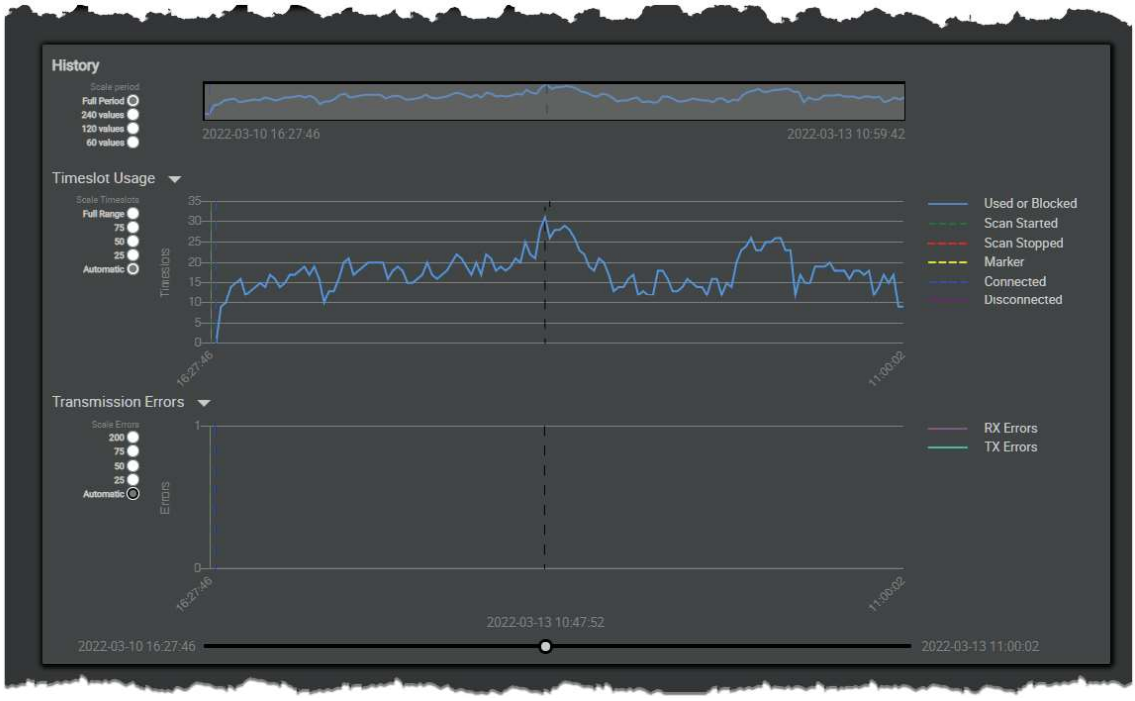


Figure 153: Beltpack Radio Monitor (History Section)

The upper diagram shows the period for which collected data is available.
For large time periods you can set the **Scale period** by using the radio buttons whether the entire period (**Full Period**) or only parts of it should be displayed (**240/120/60 values**).

The middle diagram **Timeslot Usage** shows the logged timeslots used in the radio spectrum seen by the Beltpack..
Country dependent the total amount of available timeslots varies between 40 and 120.
To identify Beltpacks/areas were the radio spectrum is fully occupied or interfered, all Beltpacks scan their environment constantly if an Advanced Monitoring license is present in the network space.
With the radio buttons '**Scale Timeslots**' the vertical resolution (number of displayed timeslots) of the diagram can be adjusted (**Full Range, 75/50/25, Automatic**).

The lower diagram **Transmission Errors** shows the TX and RX frame error rate. Frame errors below 10 are typically not audible.

The Beltpack will do three to six spectrum scans every minute and stores up to three days of data.

With the slider below it is possible to select an earlier time and to check the history information in detail.

Snapshot section

Figure 154: Beltpack Radio Monitor (Snapshot Section)

The '**Snapshot**' section shows all available carrier frequencies and timeslots. It gives an idea about additional capacity within the Antenna's radio area.
There are 12 timeslots available per carrier. For operation a Bolero Beltpack uses one timeslot.

The diagram **Timeslot Map** shows detailed information about used and interfered timeslots.
Yellow marked slots are not monitored because the Beltpack is blind on these slots as it operates on one of these timeslots.

2.9 License Installation

This chapter describes how to change licenses on Bolero Antennas.

The license on Antennas can be changed by a license file that is provided by your local distributor. The name of the license file needs to be equal to the serial number of the Antenna where the license will be installed. The serial number of an Antenna is 13 digits long and contains numbers only (e.g. "1234512345678"). The license file is a "bin"-file (e.g. "1234512345678.bin"). Every license file is only readable by the Antenna matching the serial number.

A license file (.bin) must be packed into a zip-archive (.zip). Licenses of multiple Antennas can be changed at the same time, as they are combined in one zip-archive.

	A license file is valid for two weeks after building. If the license file will be installed after that period, the license file will be rejected and needs to be regenerated; even with the same content. The building date of a license file that should be installed must be newer as date of the already installed license.

Follow these steps to install licenses:

- Click on the  settings icon and select the entry **License Manager**.

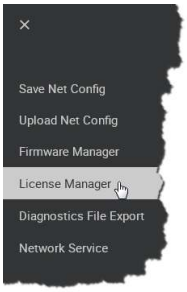


Figure 155: License Manager

A dialog is opened to enter the **Admin-PIN** of the Network-Space.

- Enter the **Admin PIN**, that was defined when the Network-Space was created.

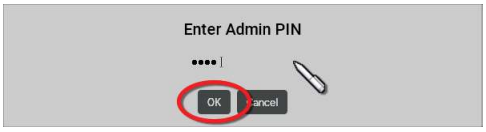


Figure 156: Dialog – Admin-PIN

- Click on the '**Install License**' button.
- Navigate to the location of the license file (zip) and select the desired one by clicking the **Open** button.

	Use the '**Create License Info File**' button to create a csv-file with all Antenna information like name, serial number and license information.

Figure 157: License-Manager – Install License

A dialog is opened to confirm the installation of all compatible licenses.

- Click the **Apply** button to proceed.

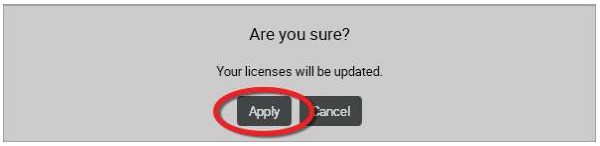


Figure 158: License-Manager – Confirmation

The license manager installs the loaded licenses on the respective Antennas.
After installation a report is opened and lists errors as well as Antennas with and without installed license.

- Click the **Close** button to exit the license manager.

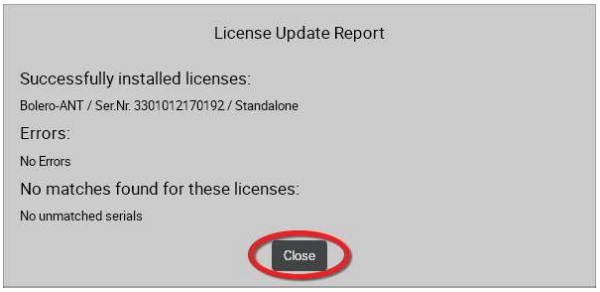


Figure 159: License-Manager – Report

2.10 Switch Recommendations

This page describes all technologies that are needed for Bolero traffic and describes a simple network classification that can be used to specify the switch that you need to choose.

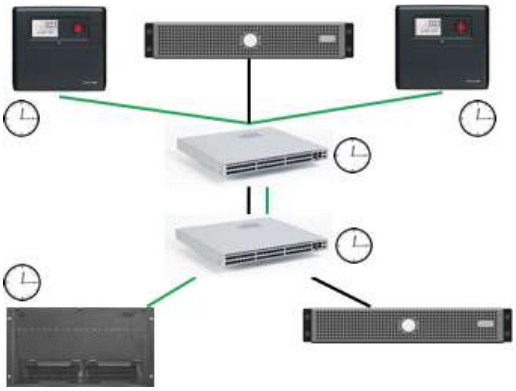
	After reading these pages, you should be able to determine, if a switch is suitable for Bolero by looking at the spec sheet. If you classify the network you are building, choosing a switch can be done without excessive testing.

The Bolero system requires following key technologies for a seamless and reliable operation. In case one of the network switches does not support all these features, it might happen that Antennas connected to these switches reboot during operation.

PTPv2 (IEEE 1588)

PTPv2 boundary clock or transparent clock is required on every switch. PTPv2 is necessary for the synchronization of Bolero Antennas. The synchronization offset and jitter must not exceed a certain threshold for a reliable operation and beltpack handover. Switches without PTP may exceed these limits in idle mode or only when occasionally a higher data traffic is present. Supported PTP modes are AES67 profile, End-to-End delay measurement, and multicast traffic mode.

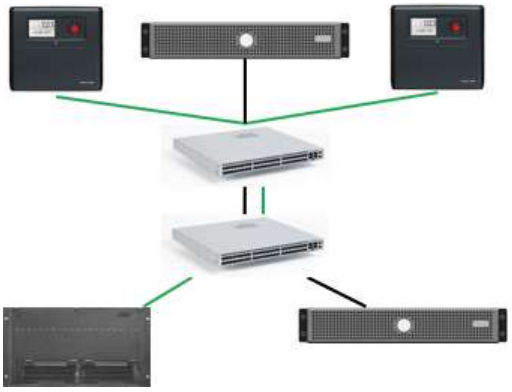
- Provides better synchronization of Bolero Antennas. The synchronization offset must not exceed 1 microsecond.
- Critical, if the network contains a lot of other devices (Video over IP, Servers, ...).
- Supported PTP mode:
  • AES67 profile
  • End-to-End delay measurement
  • Multicast traffic mode



QoS (IEEE 802.1p), based on DiffServ (RFC 2474)

With QoS the traffic from the Bolero Antennas can be prioritized when transmitted through a larger network. This is extremely important when the network contains more than one switch. Prioritization is needed for PTP [E, F] and AES67 [AFU1] traffic.

- Traffic from the Bolero Antennas can be prioritized when transmitted through a larger network.
- Extremely important when the network contains more than one switch.
- Prioritization on:
  a. PTP [E, F]
  b. AES67 [AFU1]

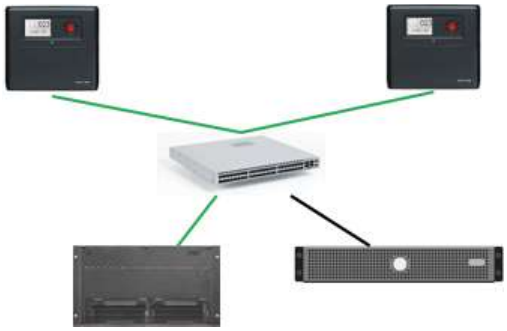


IGMP snooping (v2)

Required on the switch so that the multicast traffic only reaches ports that explicitly ask for it. It also prevents Artist CPU card from being flooded with Bolero traffic. Please note the limit of Multicast groups of a switch. Bolero needs 6 plus the amount of Beltpacks Multicast groups. (Example: 42 Beltpacks require min. 48 multicast groups). Cascading of switches does not raise the system limit. The lowest supported number of multicast groups of a switch in the complete system is the limit.

- Multicast traffic only reaches ports that explicitly ask for it
- Also prevents Artist CPU card from being flooded with Bolero traffic

Please note the limit of Multicast groups of a switch. Bolero needs 6+[amount of Beltpacks] Multicast groups (example: 42 Beltpacks require 48 Multicast groups). Cascading of switches does not raise the system limit. The lowest supported number in the complete system is the limit.



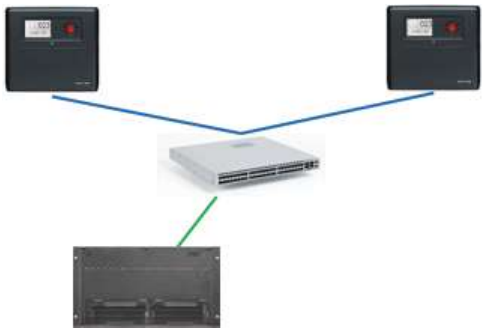
PoE+ (IEEE 802.3at)

Required to power the device without external PSU. When using power over Ethernet the Antenna can be powered from the switch. PoE+ provides up to 30 W of power per port. Please note that the most switches do not power all ports simultaneously. The power supply limits the total power.

- Provides up to 30 W of power per port
- Antenna can be powered from the switch

Please note that the most switches do not power all ports simultaneously. The power supply limits the total power.

When using Power over Ethernet use PoE+ switches only.



Jitter / Throughput / Latency

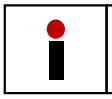
Bolero requires non-blocking switches and low jitter for a reliable and stable operation. Each Switch has a certain throughput that defines the speed of the backplane/switch fabric to transport packets from port to port. Cheaper switches have a smaller throughput than the sum of all ports speed. These switches are "blocking" and can cause higher jitter values.
Speeds are usually given in "Mpps" (Million packets per second) and are counted for 64byte packets. One Gbit port needs 1.488Mpps to be "non-blocking", so a 24-port switch needs at least 35,71 Mpps to be non-blocking.

	When using Power over Ethernet use PoE**+** (PoE **plus**) switches only! The power of switches that are supporting PoE only is not sufficient!

	A 1Gbit Ethernet connection is necessary to operate the Bolero net.

2.11 Network Requirements

Bolero uses a number of network addresses that must be open for the system to work. If you want to restrict multicast traffic to and from the Antennas, please make sure that the following addresses are open.



Not all multicast groups are used all the time. For example, the firmware update multicast groups are only used during firmware updates.

Integrated Mode

Traffic	Address	Port	Source IP
WebUI Discovery (Bonjour)	224.0.0.251	5353	Every Bolero Antenna
PTP v2	224.0.0.107, 224.0.1.129	319, 320	Acting PTP Master, every PTP Slave
Firmware Update	230.4.4.1, 230.5.5.1	1044	Every Bolero Antenna
Topology Change	224.0.0.38	40000, 40001	Every Bolero Antenna
Loop Detection	239.192.29.10	30181	Every Bolero Antenna
Bolero Configuration & Antenna Discovery	239.202.29.2	30301, 30304, 30312	Every Bolero Antenna
Beltpack Discovery & Assignment	239.202.29.3	30321	AES67-108-G2-Client Cards and Artist-1024-SICs with configured Beltpacks
AES67 Streams (Active Antenna ⇨ Artist)	Varying, one address per Beltpack (configured via Director) Artist/Director restriction: IPv4 Range: 224.0.2.0 ... 239.255.255.255 Multicast Port: 1024 ... 65535	Default: 5004 (configured via Director)	One Source IP per Bolero Antenna
AES67 Streams (Artist ⇨ Active Antenna)	Same Multicast Group as the other direction (Active Antenna ⇨ Artist)	AES67-108-G2 Client Card: 42000 or 42001 Artist-1024-SIC: Default: 42000 (configured via Director)	One Source IP per Client Card

Standalone Mode

Traffic	Address	Port	Source IP
WebUI Discovery (Bonjour)	224.0.0.251	5353	Every Bolero Antenna
PTP v2	224.0.0.107, 224.0.1.129	319, 320	Acting PTP Master, every PTP Slave
Firmware Update	230.4.4.1, 230.5.5.1	1044	Every Bolero Antenna
Topology Change	224.0.0.38	40000, 40001	Every Bolero Antenna
Loop Detection	239.192.29.10	30181	Every Bolero Antenna
Bolero Configuration & Antenna Discovery	239.202.29.2	30301, 30304, 30312	Every Bolero Antenna
AES67 Streams (Active Antenna ⇨ IO Device)	Any valid Multicast Address (configured via Bolero Web Interface "IO Device Config")	Dynamically assigned by Bolero Firmware: 40000 + IODevice ID	One Source IP per Bolero Antenna
AES67 Streams (IO Device ⇨ Active Antenna)	Same Multicast Group as the other direction (Active Antenna ⇨ IO Device)	Dynamically assigned by Bolero Firmware: 41000 + IODevice ID	One Source IP per IO Device
AES67 Streams (Beltpack ⇔ Beltpack)	Any valid Multicast Address, one Address per Network Space (configured via Bolero Web Interface "Edit Network Space")	Dynamically assigned by Bolero Firmware	One Source IP per Bolero Antenna

2.12 PTP Grandmaster Selection

New in 3.1

To synchronize all Antennas, Bolero uses PTP. The Precision Time Protocol (PTP) is a protocol used to synchronize clocks throughout a network. Bolero Antennas are using the Best Master Clock Algorithm (BMCA) to identify the Grandmaster clock.

The BMCA allows a Bolero Antenna to automatically take over the duties of Grandmaster when the previous Grandmaster gets disconnected due to a switch fault, a broken cable or is unable to continue for any other reason.

After power up the Bolero Antenna is listening for Announce messages from the PTP general multicast address. An Announce message contains the properties of the clock which sent it. If the Bolero Antenna sees an Announce message from a better clock it goes into a slave state. If the Bolero Antenna does not see an Announce message from a better clock within the Announce Time Out Interval, then it takes over the role of Grandmaster.

This process runs continuously so master capable devices are constantly looking for the possible loss of the current master clock.

The Announce message contains properties of the clock that defines if a device becomes a Grandmaster.
The following list shows the criteria in order of precedence.

1.	**Priority 1**	In Bolero this value is set to 128 and cannot be changed. Smaller numeric values indicate higher priority. Normally this is set to 128 for master capable devices and 255 for slave only devices. If you want to overrule the normal selection criteria some devices can change the Priority 1 and create any pecking order you wish. (Not Bolero!)
2.	**Clock Class**	Bolero Antennas have a Clock Class of 228. A clock with a GPS receiver locked to Universal Coordinated Time (UTC) has a different class than one which is free running like Bolero. There are also states for various levels of holdover when a clock which had a GPS receiver lost the connection.
3.	**Clock Accuracy**	Not applicable for Bolero as it has a free running clock. This is an enumerated list of ranges of accuracy to UTC, for example 25-100 ns.
4.	**Clock Variance**	Not applicable for Bolero as it has a free running clock. This is a complicated log scaled statistic which represents the jitter and wander of the clocks oscillator over a Sync message interval.
5.	**Priority 2**	This is the Bolero “PTP Master Priority” setting. The main purpose is to select an internal grandmaster for the net, if no other device with better Clock Class or Priority 1 is found. It allows system integrators to identify primary and backup clocks among identical redundant Grandmasters. Smaller numeric values indicate higher priority.
6.	**Source Port ID**	This is a number which is required to be unique. Bolero is using the Ethernet MAC address. It guarantees that there is no draw.

3 Bolero Beltpack

The Bolero Wireless Beltpack is a light and compact, digital station with six individually configurable keys for intercom, IFB or GPO triggering use. Two rotary level controls on the front of the Beltpack allow volume-control for each key and menu navigation. Pushing the Talk key toggles talk on/off with momentary or latching operation as well as an Auto mode that combines both functions in one. Activation is indicated in the display and a button backlit LED. Optional super bright call LEDs and a vibration motor are able to indicate an incoming call or warnings. The Beltpack features a sunlight readable color display which by default shows the labels for the six function keys. In addition, the display gives the user access to the Quick menu and the intuitive configuration menu.
With the new "Touch&Go" Beltpack registration a quick and user-friendly registration is implemented. Just touch the Beltpack to the Antenna and GO.
The Bolero Wireless Beltpack has a user replaceable XLR connector for headset, a 3.5mm jack for a line-in signal and a USB port for firmware updates. Bolero DECT-Beltpacks support Bluetooth 4.1, allowing a Smartphone to be connected. When a Smartphone is connected, the Beltpack can act like a car's "hands free" setup so the user can receive calls on their phone and talk and listen via their Beltpack headset. Users can also inject phone calls directly into the intercom channels, providing new levels of workflow flexibility. A fully charged Bolero rechargeable Battery allows more than 17 hours of operation. The rugged housing with rubber protectors houses the internal antennas.

New in 3.1 The Bolero product portfolio has been expanded by a 2.4GHz type Antenna and Beltpack that operate exclusively in the 2.4GHz range.
The Beltpacks do not differ in functionality, but 2.4GHz-Beltpacks will only connect to 2.4GHz-Antennas and DECT-Beltpacks will only connect to DECT-Antennas. Talking from a 2.4GHz-Beltpack to a DECT-Beltpack or vice versa works as long as they are both in the same Network Space or connected to the same Artist net. All Beltpack types can use the same Charger (even at the same time) for charging and updating.
All types of Beltpacks can be registered via NFC on all types of Antennas, i.e. registering a 2.4GHz-Beltpack on a DECT-Antenna or a DECT-Beltpack on a 2.4GHz-Antenna is possible. Of course OTA (over-the-air) registration works only for Beltpacks and Antennas of the same type (both 2.4GHz or both DECT).

3.1 Operating Elements

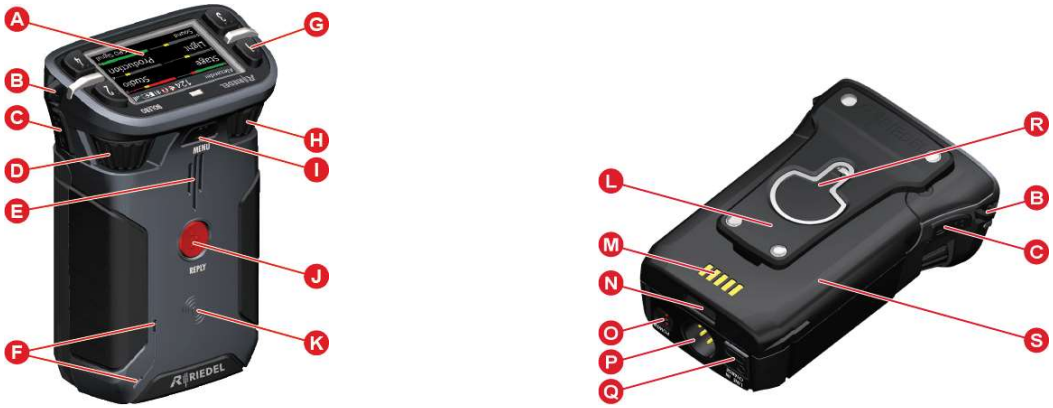
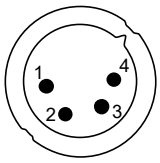


Figure 160: Beltpack – Operating Elements (front/top, rear/bottom)

A	Full color sunlight readable display
B	Lanyard or safety cord mounting holes
C	Walkie-Talkie keys 5+6 (side)
D	Rotary encoder (**2**)
E	Speaker
F	Microphones
G	Keys 1...4 (top)
H	Rotary encoder (**1**)
I	Menu key
J	Reply key
K	NFC contact point
L	Belt clip
M	Charging contacts
N	Battery release button
O	Power button
P	Headset connector (XLR-4)
Q	Line-In and charging sockets (3.5mm jack / USB Type-C) underneath a rubber cover
R	Screw head mount and bottle opener
S	Removable battery pack

XLR-4 (male)



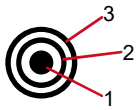
Pin	Description
1	Microphone -
2	Microphone + (+5 VDC)
3	Earphones -
4	Earphones +

Figure 161: XLR 4 male

The headset connector is a 4-pole male XLR connector and supports mono headsets with electret or dynamic microphones, depending on the menu setting.

The microphone power (+5 VDC) will be switched on if the menu setting '**Audio** > **Headset Type**' is set to **Electret**, **Electret detect** or **Auto** and an electret microphone is attached.

3.5mm jack (female)

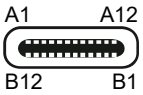


Pin	Description
1 (Tip)	Left
2 (Ring)	Right
3 (Sleeve)	GND

Figure 162: 3.5mm jack female

The 3.5 mm jack is a line input connector. The maximum input level is +12 dBu.

USB Type-C



Pin	Description	Pin	Description
1	GND	7	Dn1
2	SSTXp1	8	SBU1
3	SSTXn1	9	VBUS
4	VBUS	10	SSRXn2
5	CC1	11	SSRXp2
6	Dp1	12	GND

Figure 163: USB Type-C

The USB connector is used to charge the Beltpack.

Charging is only possible with >500 mA USB ports. 100 mA are not supported.
The charge current is limited to 500 mA by the Beltpack.

3.2 Status LEDs

Figure 164: Beltpack – Status LEDs (top)

1	**Status**	***off***	Beltpack is turned off
		green	• Beltpack ready (System ok) • Beltpack off, USB charging, battery full
		green blinking	USB charging, battery level >90
		red	• Booting • Beltpack not registered/not connected • Low battery level (<15%) • Outside the Antenna coverage area
		red blinking	Critical battery level (<8%)
		red fast blinking	Critical error (no function)
		orange	Mic unmuted, Sidetone on
		orange blinking	USB charging, battery level <90%
		orange fast blinking	Locate function active
		orange-red blinking	• Mic unmuted • Sidetone on • Critical battery level (<8%)
2, 3	**Call**	***off***	No active call
		green	Incoming call
		green blinking	Volume increase/decrease
		bright orange	Incoming / outgoing notification (beep)

3.3 Basic Operation

3.3.1 Startup

Turn the Beltpack on (or off) by pressing the '**Power**' button on the bottom.

i	If the Beltpack is already registered to a Net, the Beltpack will try to establish a connection to it. An unregistered Beltpack shows "**Not registered!**" on the splash screen. Pushing the '**Reply**' key for a second opens the **Registration** menu to register the Beltpack in a Bolero-Net. (⇨'Add Beltpacks'.)

Figure 165: Power on/off

The Main-View appears after successful registration and establishing a connection to a Net:

Figure 166: Main-View

Status bar	Beltpack name		Alexander
	Beltpack ID		24
	Silent mode		
	Speaker mode (Walkie-Talkie)		
	Headset not connected		
	Listen / Monitor information		
	Bluetooth	paired	
		connected	
	Battery status	Charge level indicator	
		USB charging	
		USB charging (battery full)	USB
	Radio level status		
Main area	6 keys	Key number	1 ... 6
		Level meter	
		Name of the channel or function that is assigned to the respective key (e.g. Reply, Set Trigger, Menu-Shortcut, Toggle Setting, etc.).	Stage

3.3.2 Key Functions

While the display is showing the Main View, users may talk or listen individually or at the same time to all channels.

A channel can be activated by pressing one of the six corresponding keys (e.g. key 1).
All active channels are highlighted in color in the display and inactive channels are shown in dark gray.

Figure 167: outgoing call

The keys 1 to 4 are latching by default. Push again the key to deactivate the respective channel.
The keys 5, 6 and Reply are none latching by default (momentary). That means releasing this key will stop talking to this channel (Walkie-Talkie mode, PTT – push to talk).

Incoming calls are additionally indicated by the green Call LED on the corresponding side. (Channel 1, 3 and 5 on the left side and channel 2, 4 and 6 on the right side).

Figure 168: incoming call

i	The key mode (Latching / PTT) is set in Director if the system is set to **Integrated/Artist** mode. For a new configuration in Director, all 6 keys are in momentary mode by default.

Menu Key

Three different functions can be triggered by pressing and holding the Menu key for a certain time.

Hold time of the Menu key	Description
short key press (<0.5 sec.)	Setting of individual volume or muting of individual channels.
middle key press (0.5 ... 3 sec.)	The Quick Menu contains shortcuts to frequently used menu items.
long key press (>3 sec.)	Information can be called up and settings can be made in the Main Menu.

Abbildung 169: Menü-Taste

Navigation

Following keys can be used to navigate in the menu:

• **Rotary Encoder 1** • **Rotary Encoder 2**	• Select the next or previous menu item • Change values/settings
• **Key 3** • **Reply Key**	• Back to parent menu item • Cancel editing of values/settings
• **Key 4** • **Menu Key**	• Enter selected menu item • Confirm values/settings

3.3.3 Volume Adjustment

The two knobs allow you to adjust and limit the overall volume of all channels or the volume of individual channels.

Master volume

By turning one of the two rotary encoders while the display shows the main view, the overall volume of the speaker or headset can be adjusted.
The current total volume is shown in a level meter in the header.

Figure 170: Master Volume

Channel volume

To change the volume of individual channels, briefly press the menu key (**1.** <0.5 sec.).
Then use the two rotary controls (**2.** A+B) to adjust the volume of the first two channels (1+2). The level meters above the key labels indicate the channel volumes set in each case.
Further short keystrokes on the menu key change to the next channels 3+4, 5+6 and finally to the Reply key. Another short key press returns to the main view.
If no change takes place for 3 seconds, the Beltpack also switches back to the main view.

Figure 171: Channel Volume

3.3.4 Quick Mute

A Beltpack user is able to quickly mute a Partyline (or any other audio source) assigned to a key without turning the volume down to minimum. This is done by entering the volume menu (**1.** short press on the menu button) and then pressing the desired key (**2.** e.g. key 1) to mute or unmute. When the key is unmuted, the original volume is restored.
The volume level can be changed even while the audio source is muted.
Muting an active audio source will deactivate it.

Figure 172: Quick Mute

This feature has slightly different behavior in **Standalone** system mode:

• **Integrated/Artist Mode**	Muting behaves as described above.
• **Standalone/AES67 Mode** • **Standalone/Link Mode**	The behavior of a muted key can be customized: • In the Web Interface: (⇨ Edit (Beltpacks)) **Beltpacks** > **Edit** > **Keys** > **Action - Muted Key Pressed** • In the Beltpack Main Menu: (⇨ General Settings) **General Settings** > **Key Assignment** > **Key 1 ... 6, Reply** > **Action - Muted Key** Options: • **Keep Mute State**: No changes, the incoming audio signal stays muted. • **Unmute**: The incoming audio signal is immediately unmuted when the key is activated. • **Momentary Unmute**: The incoming audio signal is immediately unmuted when the key is activated and automatically muted when the key is deactivated again.

3.3.5 Quick Menu

The Quick-Menu is opened by pressing and holding the Menu key (0.5 ... 3 sec.).
The Quick-Menu allows using up to 16 user defined shortcuts to frequently used menu commands.

Navigate with one of the rotary encoders to the desired menu item and press the menu key to open the respective menu.
The selected menu item can be deleted in the Quick Menu by pressing the Key-1.
A user defined menu item can be assigned to the Quick-Menu by pressing the Key-2 and selecting the desired menu item.

Figure 173: Quick-Menu

Header	Time		14:43
	Silent mode		
	Speaker mode (Walkie-Talkie)		
	Headset not connected		
	Listen / Monitor information		
	Bluetooth	paired	
		connected	
	Net name / Net ID		Bolero-Net / 2
	Microphone type (dynamic, electret, error)		D-Mic E-Mic Mic-Err
	Battery status	with remaining operation time	12h30m
		Battery error	ERR
		USB charging	
		USB charging (battery full)	USB
	Radio level status with level indication		-58 dBm
Main area	User defined menu shortcuts: • Brightness Mode • Lock Keys • Headset Type • Side Tone • Silent Mode		Brightness Mode Medium Lock Keys Headset Type Auto Detect Side Tone -12 dB Silent Mode Off
Navigation Bar	Reply key or Key 3 – one layer back		Back
	Key 1 – delete the selected item		1 Del
	Key 2 – add item		2 Add
	Menu key or Key 4 – select item		M Select

3.4 Main Menu

The Main Menu is opened by pressing and holding (>3 sec.) the Menu key.
Basic information is displayed and settings can be modified in the Main Menu.

Abbildung 174: Hauptmenü

> The Beltpack language can be changed in the menu "**Allgemeine Einstellungen** > **Language**" to '**English**'.

The Main-Menu contains following entries:
(Default values are *underlined*.)

- Audio
- Brightness
- General Settings
- Bluetooth (***New in 3.1*** not available for 2.4GHz-Beltpacks)
- Registration
- Admin
- Service

3.4.1 Audio

Gain Settings	**Headset Volume**	Volume level of the headset: Mute, -60 ... *-12* ... +12 dB
	Speaker Volume	Volume level of the speaker: Mute, -60 ... *0* ... +12 dB
	Side Tone	Volume level of the Sidetone: Mute, -60 ... *0* ... +12 dB
	Headset Microphone	Gain level of the headsets microphone: 0 ... *+8* ... +30 dB
	Internal Microphone	Gain level of the internal microphone: 0 ... *+15* ... +30 dB
	Line Input	Gain level of the Aux input: Mute, -60 ... *-12* ... +12 dB
	Priority Dim	Dim level of priority calls: Mute, -72 ... *-20* ... 0 dB
	Beep Notification	Volume level of the beep tones (relative to Headset/Speaker volume): -24 ... *-12* ... +12 dB
	Voice Notification	Volume level of the voice notifications (relative to Headset/Speaker volume): -24 ... *-6* ... +12 dB
	Microphone Limiter	Threshold level of the microphone limiter: *Off*, -72 ... 0 dB
	Headset Limiter	Threshold level of the headset limiter: *Off*, -72 ... 0 dB
	Bluetooth Mobile/PC Volume *1	Volume level of the Bluetooth audio signals: Mute, -60 ... *0* ... +12 dB
	Bluetooth Microphone *1	Bluetooth microphone amplification: -24 ... *0* ... +12 dB
	Headphone Lower Limit	Lower volume level of the headset: *Mute*, -60 ... +12 dB
	Speaker Lower Limit	Lower volume level of the speaker: *Mute*, -60 ... +12 dB

*1 only for DECT-Beltpacks

VOX	**BT/Line Input VOX Dim**	**Off**: The VOX functionality is turned off. The audio signal is always going through. **Standard**: The VOX functionality is turned on. BT/Line audio is switched through depending on the configurable parameters **Threshold** and **Hold Time**. **Adaptive**: The adaptive VOX functionality is switched on and the threshold is continuously adapted to the current background noise. BT/Line audio is switched through depending on the configurable parameters **Delta** and **Hold Time**.	
Audio Usage HSA	**Name of the Audio Ports 1 ... 35**	List of all audio ports the Beltpack is able to listen to.	
		Volume	Volume level of the audio ports: Mute, -60 ... *0* ... +12 dB
		Mute	Muting of the audio ports: *Off*, On
Listen & Monitoring Devices HSA	List of other devices that are currently monitoring or listening to this Beltpack.		
Headset Type	Selection of the microphone type in the headset: *Auto detect*, Dynamic detect, Electret detect, Dynamic, Electret		
Plug Function	Checkbox to adjust behavior when (dis)connecting a headset at the XLR connector.		
	Plug	The Beltpack activates the headset mode if a headset is connected. *On*, Off	
	Unplug	The Beltpack activates the speaker mode if the headset is disconnected. On, *Off*	
Enhancements	**Microphone Filter**	Headset microphone filter: *off*, low-cut 60/120Hz, filter for AIR/PRO/MAX/RUN headsets dynamic/electret	
	Headphone Filter	Headphone filter: *off*, low-cut 80/150Hz, filter for AIR/PRO/MAX/RUN headsets standard/plus	
	Headset Echo Suppression	Prevents/reduces acoustic echo distortions to improve voice quality of headsets: *Off*, On. **Echo suppression** is always on in Speaker mode.	
Speaker	Enables the internal speaker and microphone (walkie-talkie mode): *Off*, On If the silent mode is active while the speaker mode is enabled, the silent mode is turned off and a warning is shown (Silent Mode is turned off).		

HSA only in **Standalone/AES67** or **Standalone/Link** mode

3.4.2 Brightness

Brightness Mode	Selection between one user defined and four pre-defined brightness definitions: Off, Low, *Medium*, High, Custom	
Settings	**Display**	Normal brightness level of the display: Off, 0 ... *50* ... 100% (10% steps)
	Display Dim	Dimmed brightness level of the display: Off, 0 ... *50* ... 100% (10% steps)
	Display Dim Timer	After this time of inactivity, the display illumination is dimmed: Off, 1 ... *10* ... 240 sec.
	Display Timeout	After this time of inactivity, the display illumination is switched off: *Off*, 1 ... 240 sec.
	Keys	Normal brightness level of the keys: Off, 0 ... *60* ... 100% (20% steps)
	Keys Dim	Dimmed brightness level of the keys: Off, 0 ... *20* ... 100% (20% steps)
	Keys Dim Timer	After this time of inactivity, the key illumination is dimmed: Off, 1 ... *10* ... 240 sec.
	Keys Timeout	After this time of inactivity, the key illumination is switched off: *Off*, 1 ... 240 sec.
	Call LED Brightness	Brightness level of the Call LED: 20 ... *40* ... 100% (20% steps)
	Status LED Brightness	Brightness level of the Status LED: 20 ... *80* ... 100% (20% steps)

3.4.3 General Settings

Name & ID	**Name**	Entry of the 12-digit Beltpack name.	
	ID	Entry of the 3-digit Beltpack ID.	
Profile	In a profile user rights, keys and parameter settings are defined. Profile changes are possible in the web interface.		
	Change Profile	Changes the profile of the Beltpack. A list of available profiles is displayed.	
Key Assignment	**Key 1 ... 6, Reply**	**Function**	• none • Talk • Talk - Always Listen • Talk & Listen • Notification/Beep Select • Reply • Menu Shortcut • Toggle • Monitor Trigger • Set Trigger • Volume + • Volume -
		Destination/Source	• Beltpack • Partyline • Audio Channel
		Mode	• *Momentary* (default Key Reply) • Latched • *Auto* (default Key 1 ... 6)
		Priority	• Defines the priority of the function: **High**: All other audio signals with lower priorities (Standard or Low) are dimmed at the sink when the audio signal with high priority is active. **Low**: This audio signal is dimmed when the sink receives an active audio signal with higher priority (Standard or High).
		Key Group	Local key group on the Beltpack in which only one key can be active at a time: *Off*, 1 ... 5
		Action-Muted Key	Action when a muted key is pressed: (⇨ Quick Mute) • **Keep Mute State**: No changes, the incoming audio signal stays muted. • **Unmute**: The incoming audio signal is immediately unmuted when the key is activated. • **Momentary Unmute**: The incoming audio signal is immediately unmuted when the key is activated and automatically muted when the key is deactivated again.
	External Key 1 / 2	**Function**	Remote Key
		Mode	• *Momentary* • Latched • Auto • On only • Off only
		Destination	• Key 1 ... 6 • Key Reply

Rotary Assignment	**Volume Rotary 1/2**	Defines the channels adjusted by the rotary encoder: *Master*, Key 1...6 , Reply, Bluetooth, Line Input
Notification	**Call**	Defines the signalization mode of a call: *Light*, Vibrate, Beep
	Notification/Beep	Defines the signalization mode of a notification e.g. beep call: *Light*, *Vibrate*, *Beep*
	Info/Low Battery	Defines the signalization mode if the battery power is low: *Light*, *Vibrate*, Beep, *Voice*
	Out of Range	Defines the signalization mode if the Beltpack loses the connection to the Antenna: *Light*, *Vibrate*, Beep, *Voice*
	Volume Keys	Defines the signalization while using the volume keys: Vibrate, *Beep*, Voice
Silent Mode	Disables the speaker and vibrator: On, *Off*	
Display Mode	In all modes the font size is automatically reduced to fit long content into the fields:	
	Standard	default value
	Alternative	Key 5 and 6 are in the middle of the screen.
	Standard Flip	Standard, display upside down
	Alternative Flip	Alternative, display upside down
Replay	The Replay function allows repeated listening to the last call. Recordings are VOX controlled. Thus, no silence is recorded.	
	Playback	Starts the playback of the latest recording.
	Recording Time	Defines the duration of recordings: Off, 1 ... *3* ... 15 Sec.
	Store Time	Defines the time, how long the recording is stored: 1 ... *60* ... 240 Min.
Timeout	**Menu**	After this time of inactivity, the menu will be closed and the display shows the Main-View: 5 ... *120* ... 240 sec.
	Volume Change	After this time of inactivity, the volume adjustment is terminated: 1 ... *3* ... 240 sec.
Language	Selection of a pre-programmed language: *English*, Deutsch ***New in 3.1*** Besides German and English, a Chinese translation of all Beltpack menus is now available.	
Lock Keys	Lock the keys to prevent accidental key actions: locked, *unlocked*	

SA only in **Standalone/AES67** or **Standalone/Link** mode

3.4.4 Bluetooth

New in 3.1 This menu is not available for 2.4GHz-Beltpacks.

Bluetooth State	Enable the Bluetooth functionality: Off, Connect to Headset, Connect to Mobile/PC
Connect / Disconnect	• Disconnect: If connected to a device • Connect: if not connect to a device
Pair / Delete Pairing	Activates the paring mode and will be visible for other devices.
Share to net *1	Shares an active telephone call (no music) via intercom: *Local*, Public
Dim Level *1	Dimmed Bluetooth audio level if Beltpack has an active intercom conference: *Mute*, -24 ... +12 dB

*1 only if "Connect to Mobile/PC"

Further information can be found in chapter 'Bluetooth'.

3.4.5 Registration

Register to net	Registers the Beltpack to an existing net. The OTA registration PIN is necessary (Admin PIN by default). A list of available nets is displayed: • Over The Air (OTA)
Connect to pre-registered net *1	Registers the Beltpack to previous registered nets. A list of available pre-registered nets is displayed: • Select one to connect • Currently connected net is shown with radio select icon
Delete pre-registered net	Deletes previous registered nets in the Beltpack. A list of pre-registered nets is displayed: • Select one to delete
Allow multi-registration *2	*On*: The Beltpack can be registered in up to 10 Nets. If the Beltpack is registered in another new Net, the 'oldest' Net form the list will be automatically overwritten. Off: For security reasons the multi-registration can be set to Off. The Beltpack can be registered to a single net only. All pre-registered nets except the current connected net will be deleted.
Automatic net change	*Off*: The Beltpack will only ever try to reconnect to the last connected Network Space. On: This allows the Beltpack to search for any of the pre-registered Network Spaces when trying to connect (the last connected Network Space will be checked first).

*1 only if **Allow multi-registration** is enabled
*2 automatically enabled if **Automatic net change** is enabled

Further information can be found in chapter 'Add Beltpacks'.

3.4.6 Admin

The Admin PIN is required to access the Admin menu.

Registration Mode	**Local Beltpack NFC**	Registers a Beltpack at an already registered Beltpack via NFC: • NFC (local BP) active as long as you exit
	Over The Air (OTA)	Registers a Beltpack at an already registered Antenna via DECT: **On**, ***Off*** (all Antennas)
	Antenna NFC	Allows registering a Beltpack at an already registered Antenna via NFC: **On**, ***Off*** (all Antennas NFC)
	Timeout	After elapsing this time, the registration mode is disabled: **Off**, 1 ... *2* ... 60 min. (for OTA, System wide NFC, Charger)
OTA Pin	Defines the legitimation during OTA registration	
	Disable PIN	No PIN entry is required for OTA registration.
	Set new Pin	Insert a new 4-digit PIN that is required for the OTA registration.
	Set to Admin Pin	Defines to use the Admin PIN for OTA registration.
Admin Pin	Defines the legitimation to open the Admin menu in the Beltpack or to log into the web interface of the Antenna.	
	Disable PIN	No PIN entry is required for administration.
	Set new PIN	Insert a new 4-digit PIN that is required for administration purposes.
Time Source	Selects the synchronization source of the Beltpacks time setting: *PTP*, NTP, Internal	
System Time	Allows entering the system time if the time source is set to **Internal**.	
System Date	Allows entering the system date if the time source is set to **Internal**.	
Time Format	Define the time format: 12h, *24h*	
Date Format	Defines the date format: (dd/mm/yyyy, mm/dd/yyyy, *yyyy/mm/dd*)	

3.4.7 Service

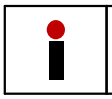
Test	**Walk Test**	Analyzes the signal quality to the visible Antennas. Following values are shown:	
		DECT	• Antenna ID • Antenna RPN • current Signal Strength • current Signal Quality
		New in 3.1 **2.4GHz**	• Antenna ID • available channels • Bars to show interference level of carrier frequencies • Radio error rate • audio error rate • retransmitted load
	Walk Test Pro	Lists all Antennas that are visible at the current position. Following values are displayed: • Antenna ID • Antenna RPN • Signal strength • Busy: available Antenna capacity (**ok**, **full**) • Errors downlink • Errors uplink	
Reset	**Profile Defaults**	Resets the profile to default values. All individual changes will be reset. All registration data stays in memory.	
	Factory Reset	Resets the Beltpack to factory default settings. All data (Net lists, Profiles, Registrations) will be lost! A new registration is required.	
Information	**Radio**	Displays a table with radio information. Following values are displayed: • Visible Antennas • Current Radio Level • Radio Quality • Antenna Name • Antenna Number	
	Beltpack	Displays a table with Beltpack information. Following values are displayed: • Package Version: **x.x.x** • Firmware Version: **Vxx.xx.xx** • Main Version: **xxx** • Display Version: **xxx** • Serial number: (13 digits)	
	Battery	Displays a table with Battery information. Following values are displayed: • Charge Status: **xx %, xxxx mAh** • Charge Mode:(**not charging**, **xxxx mA** • Temperature: (**too cold!**, **cold**, **normal**, **warm**, **too hot!**) • Battery Health: **xxx** % of max. capacity • Capacity Max.: **xxxx mAh** • Hardware: **xx.xx** • Serial Number: (13 digits)	
Area	Protected menu – for Riedel service purpose only		

3.5 Features in Detail

3.5.1 Headset Type

Open the Beltpack Menu by pressing and holding (>3 sec.) the Menu key and select ' **Audio** > **Headset Type**'. Select the microphone type of the headset:

Auto Detect	The Beltpack automatically detects the headset type.
Dynamic Detect	The Beltpack is fixed to a headset type but turns on audio only if a headset is detected.
Electret Detect	
Dynamic	The Beltpack is fixed to a headset type and audio is enabled.
Electret	



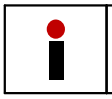
For Headset MAX D2, the "Auto Detect" function is only available for headset revisions equal or higher than 10.01.

3.5.2 Speaker

In the menu '**Audio** > **Speaker**' is defined, if the audio signal is routed to the internal speaker or to an attached headset.

The following table shows the usage of the internal and headset microphone:

	Speaker Mode: On	**Speaker Mode: Off**
Headset connected	Beltpack microphone	Headset microphone
no Headset connected	Beltpack microphone	no microphone active



In the speaker mode the echo cancellation is always active.

3.5.3 Brightness Mode

The menu '**Brightness** > **Brightness-Mode**' allows switching between different predefined and one user specified display settings. Under '**Brightness** > **Custom Settings**' the single parameters can be modified.

The predefined modes have following values:

Element	Description	Off [*1]	Low	Medium	High
Display	normal display brightness	0%	20%	60%	100%
Display Dim	dimmed display brightness	0%	10%	20%	50%
Display Dim Timer	inactivity timer to dim the display	off	5 sec.	20 sec.	Off
Display Off Timer	inactivity timer to turn off the display	off	60 sec.	Off	Off
Keys	normal key brightness	0%	20%	60%	100%
Keys Dim	dimmed key brightness	0%	20%	20%	60%
Keys Dim Timer	inactivity timer to dim the keys	off	20 sec.	20 sec.	Off
Keys Off Timer	inactivity timer to turn off the keys	off	240 sec.	Off	Off
Call LED Dim	dimmed Call LED brightness	0%	20%	40%	100%
Status LED Dim	dimmed Status LED brightness	0%	20%	60%	100%

[*1] Note that even if the display brightness is set to 0%, the display automatically turns on with 10% brightness when the Beltpack main menu, volume menu or quick menu is entered. It turns off immediately when the menu is left again.

3.5.4 Profiles

A Profile is assigned to every Beltpack when it is registered. The profile contains default settings for the whole Beltpack-Config and user rights indicating which settings of the Beltpack-Config the Beltpacks user is allowed to see and/or to change.

Using the Admin or Registration PIN, a profile can be chosen in the Antennas Web Interface or in the Beltpack-Menu that should be assigned to all newly registered Beltpacks. The Beltpack stays associated to its profile as long as it is registered.

Changes to a profile in the web interface are immediately applied to all Beltpacks using the edited profile, regardless of the previous setting on the Beltpack. Note that only the changed profile settings (highlighted in blue) are applied to all Beltpacks using this profile, while all other settings on the Beltpacks remain unaffected. Some settings are grouped (e.g. Keys, Always-On, Rotaries functions, etc.), meaning they can only be edited together. For example, changing a single key in the Profile Configuration will re-apply the settings for all keys on all Beltpacks using this profile since all keys are in one group.

The profile of a Beltpack can be changed by the Beltpack-User in the Beltpack-Menu ("Change Profile"; if he has the right), by the Admin using the Web Interface or by (re-)registering the Beltpack while a different profile is selected to be used on all newly registered Beltpacks. A profile change means that a complete reset to the new profile defaults regarding the whole Beltpack-Config.

When a user chooses to load the same profile that the Beltpack already has, the Beltpack-Config is reset back to profile defaults. Should a Beltpack be (re-)registered using the same profile that it already has, nothing is changed (e.g. no changes in the Beltpack-Config).

3.5.5 Notification

In the menu '**General Settings** > **Notification**' is defined, how different events are signalized. It is possible to combine multiple signalization types.

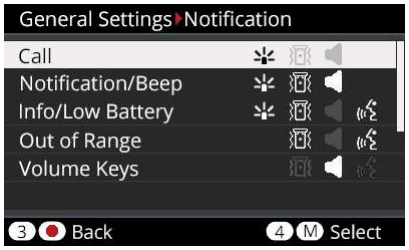


Figure 175: Notification

Events	Signalizations
Call	orange flashing Call LED
Notification/Beep	Vibration
Info/Low Battery	Signal sound (beep)
Out of Range	Voice announcement
Volume Keys	

3.5.6 Silent Mode

In the menu '**General Settings** > **Silent Mode**', the speaker and vibration can be disabled.

3.5.7 Display Mode

The menu '**General Settings** > **Display-Mode**' allows selecting between the standard view, a '**Flip**' and an '**Alternative**' view. The display modes can be combined.

The **Flip** mode flips the single rows in the display horizontally.
The **Alternative** mode displays the keys 5 and 6 in the middle.

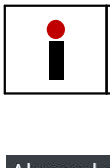
	In all modes the font size is automatically reduced to fit long content into the fields.

Figure 176: Standard

Figure 177: Standard Flip

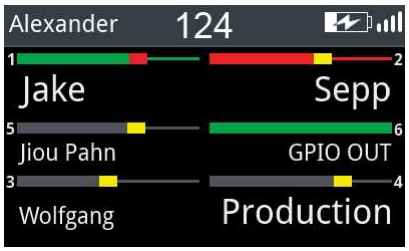


Figure 178: Alternative

Figure 179: Alternative Flip

3.5.8 Lock Keys

The menu '**General Settings** > **Lock-Keys**' allows locking the keys to prevent accidental key actions.

To unlock the keys:

1. If any key is pressed, the display shows '**Keys/rotaries locked. To start the unlock sequence, press the Menu key.**".
2. Once the menu key is pressed, the display shows "**Press Key 4 to unlock.**".
3. If key 4 is pressed during the timeout, the keys are unlocked. Otherwise the keys remain locked and the display returns to the Main-View.

3.5.9 Bluetooth

New in 3.1 This menu is not available for 2.4GHz-Beltpacks.

The Beltpack provides a Bluetooth 4.1 wireless connection, which is available even when no Antenna connection is available or the Beltpack is not registered.

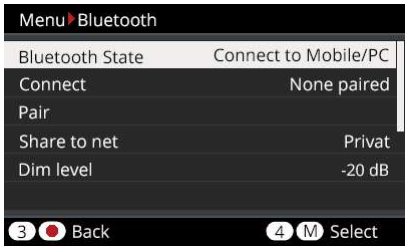


Figure 180: Bluetooth

The menu Bluetooth State allows defining the device to be paired (Headset or Mobile/PC).
After that the menu Pair / Discoverable allows pairing the desired device.

If the Beltpack is not connected to any device, the command **Connect** is displayed and allows establishing the connection to the paired device. If a connection is established, the command **Disconnect** is displayed.

After losing the Bluetooth connection:

	Bluetooth State: Mobile/PC	**Bluetooth State: Headset**
Connection loss (out of range)	The last connection is *not* reestablished.	The last connection is reestablished.
Reboot of the Bluetooth device	The last connection is *not* reestablished.	
Reboot of the Beltpack	The last connection is reestablished.	

The Mobile/PC is able to force re-establishment via button press.
During Music or Telephone call, the title or Name or number is visible in Status line.

3.5.9.1 Bluetooth State

In the menu '**Bluetooth** > **Bluetooth State**' is selected, if the Beltpack should be connected to a Mobile/PC or to a headset.

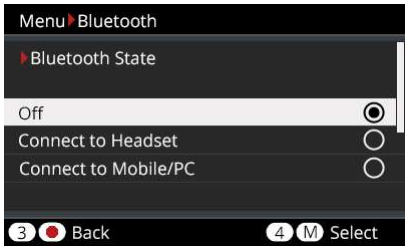


Figure 181: Bluetooth – Bluetooth State

Off	The Bluetooth functionality of the Beltpack is switched off.
Connect to Headset	The headset mode allows connecting a wireless Bluetooth headset to the Beltpack. In this mode the Bluetooth headset replaces the Beltpack's wired headset.
Connect to Mobile/PC	The Mobile/PC mode allows connecting a mobile device (mobile phone, tablet) or PC to the Beltpack. In this mode the Beltpack (including the wired headset) acts like a Bluetooth headset. The user is able to pick up a telephone call or skip forward to the next music track via the Beltpack user interface. A telephone call can be connected to one or more channels of the Beltpack (Public) or is only hearable on the connected Beltpack (Local). Music can only be heard at the local Beltpack. • Telephone call audio quality (bidirectional): Standard (20 Hz ... 4 kHz) • Music audio quality (unidirectional): HQ (20 Hz ... 20 kHz)

The Line-Input is disabled in following conditions:
- "**Connect to Headset**" mode: If there is a connection to a headset established.
- "**Connect to Mobile/PC**" mode: While playing music.
  (When the music playback is stopped, the Line-Input is enabled again.
  The Line-Input remains active even during a telephone call.)

3.5.9.2 Pair

In the menu '**Bluetooth** > **Pair**' the pairing process between the Beltpack and a Bluetooth device can be started. After selecting this menu the Beltpack is visible as an audio device called "Bolero" for other Bluetooth devices. Discovered devices are listed in the display.

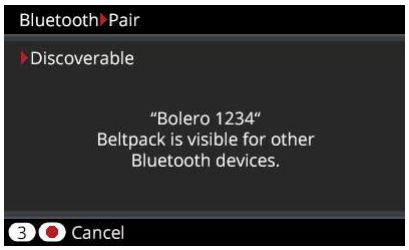


Figure 182: Bluetooth – Pair

Start the pairing process on the desired device. If a Mobile/PC is paired, confirm the generated PIN on this device. Confirm the PIN also on the Beltpack by pressing Key-4.

Figure 183: Bluetooth – Pair – Confirm

	Pairing a new device will overwrite the previous settings.

3.5.9.3 Share to Net

The telephone signal from the mobile phone can be either heard/talked-to locally or be relayed to a public/intercom channel. Therefore the user is able to share the audio signal from the Beltpack connected mobile device via an activated intercom conference (**Public**) or listen to the audio signal at the Beltpack (**Local**) only. The audio signal is mixed to all active keys (channels).

The **Public** mode is indicated by a yellow status bar.

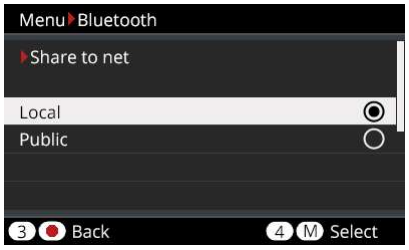


Figure 184: Share to net

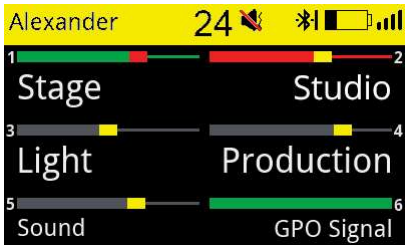


Figure 185: Public Mode enabled

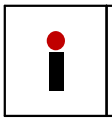
	In Public mode the Dim-Level function for the Beltpack device is disabled because the audio signal is part of the conference.

3.5.10 Add Beltpacks

Before a Beltpack can connect to a Bolero-Net, it has to be registered to it. Registration means, that the Bolero-Net knows the Beltpack, the Beltpack knows the Bolero-Net and an encryption key is generated to be used by both sides.

There are different ways to register a Beltpack to a Bolero Net:

Antenna OTA	Allows registering a Beltpack at an already registered Antenna via radio. (**O**ver **T**he **A**ir)
Antenna NFC	Allows registering a Beltpack at an already registered Antenna via NFC (**N**ear **F**ield **C**ommunication).
Beltpack NFC	Allows registering a Beltpack at an already registered Beltpack via NFC.



If the function **Allow multi-registration** is activated, up to 10 Nets can be registered in a Beltpack. Otherwise the Beltpack can be registered in a single Net. (⇨'Beltpack > Main Menu: Registration' and 'Antenna > Web-Interface > Beltpacks > Edit: Registration')

3.5.10.1 Antenna OTA

This registration mode allows registering a Beltpack at an already registered Antenna over the air.
Following steps are necessary to register a Beltpack via Antenna-OTA to a Bolero Net:

- At first the '**Registration Method (OTA)**' must be activated. This can be done in two ways:
  a) Via the Antennas web interface
  (⇨'Bolero Antenna > Features in Detail > Add Antennas').
  b) Via another Beltpack that is already registered in the Net:
  Menu '**Admin** > **Registration Mode** > **Over The Air** > **On**'.

	• This setting is system wide and stays active until disabled or the registration timeout runs out. • The registration timeout is restarted each time a Beltpack is registered.

- Then start the registration process in the Beltpack that should be connected to the Net:
  a) If the Beltpack is not registered to any Net, press and hold the '**Reply**' key for one second. The Beltpack starts automatically searching for available Nets.
  b) If the Beltpack is already connected to another Net, push the Beltpack's Menu key for >3 seconds (long key press), navigate to the menu '**Registration**' and select '**Register to net**'.

The Beltpack begins to search for available Nets and displays them one at a time.

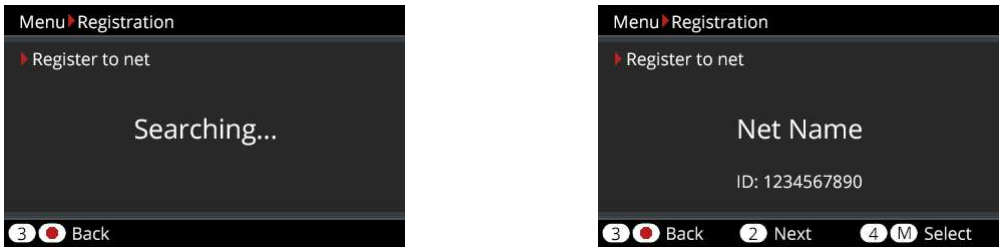


Figure 186: Net searching

- The Beltpack will continue to search until a Net is found or '**Back**' is pressed.
- If '**Back**' is pressed, the Beltpack will stop searching and return to the **Registration** menu.
- If '**Next**' is pressed, the current Net is blocked and the Beltpack will continue searching for other Nets. The blocking list is cleared by reentering the **Registration** menu.
- If '**Select**' is pressed, the user will be asked for the **OTA Registration PIN** that was defined via the Antennas Web-Interface or via the Beltpack where the registration mode was enabled (by default the **Admin PIN** is used).
- After registration, the Beltpacks are immediately connected to the Bolero net.

3.5.10.2 Antenna NFC

This registration mode allows registering a Beltpack at an already registered Antenna via NFC.
Following steps are necessary to register a Beltpack via Antenna-NFC contact point ( ) to a Bolero Net:

- At first the '**Registration Method (NFC)**' must be activated. This can be done in two ways:
  a) Via the Antennas web interface
  (⇨'Bolero Antenna > Features in Detail > Add Antennas').
  b) Via another Beltpack that is already registered in the Net:
  Menu '**Admin** > **Registration Mode** > **Antenna NFC** > **On**'.

	• This setting is system wide and stays active until disabled or the registration timeout runs out (timeout is the same as for OTA registration). • All Antenna-NFCs are switched to registration mode. • The Beltpack-NFCs of connected Beltpacks are NOT switched to registration mode.

- The Beltpacks to be registered have to be turned on; no other special setting or user intervention is required.
- Just hold the NFC contact point of the Beltpacks close to the NFC contact point of any Antenna. The Beltpacks will be registered to the same net that the Antenna belongs to.
- After registration, the Beltpacks will immediately connect to the Bolero net.

3.5.10.3 Beltpack NFC

This registration mode allows registering a Beltpack at an already registered Beltpack via NFC.
Following steps are necessary to register a Beltpack via Beltpack-NFC contact point ( ) to a Bolero Net:

At first the Registration Method '**Local Beltpack NFC**' must be activated at the already registered Beltpack:
- Push the Menu key of the registered Beltpack for >3 seconds (long key press).
- Navigate to the '**Admin**' menu.
- Enter the '**Admin PIN**' of the net.
- Select '**Registration Mode**' > '**Local Beltpack NFC**'.

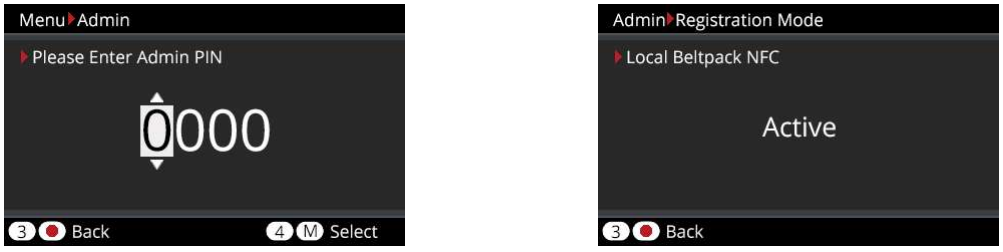


Figure 187: Registration Mode 'Local Beltpack NFC'

- The Beltpacks to be registered have to be turned on; no other special setting or user intervention is required.
- Just hold the NFC contact point of other Beltpacks close to the NFC contact point of the registered Beltpack with active local NFC. These Beltpacks will be registered to the same net that the registered Beltpack belongs to.
- After registration, the Beltpacks will immediately connect to the Bolero net.

	The Beltpack remains in active NFC registration mode until the user exits the "Local Beltpack NFC" menu. (There is no timeout.)

3.5.11 Remove Beltpacks

To de-register a Beltpack from a Net, choose the Menu '**Registration** > **Delete pre-registered Net**'.

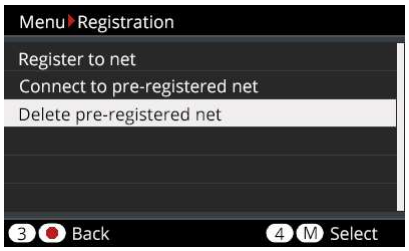


Figure 188: De-Registration

Select the Net to be removed from the list and confirm the de-registration by pressing Key-4.
If the Beltpack is connected to this Net, it will be immediately disconnected.

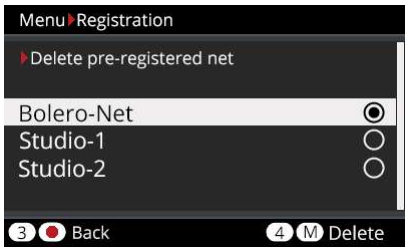


Figure 189: Delete pre-registered net

The De-Registration is also possible via the Antennas web interface.
(⇨'**Bolero Antenna** > **Features in Detail** > **Remove Devices** > Beltpacks')

3.5.12 Walk Test

The Walk Test (Pro) allows the analysis of the link quality to the visible Antennas while traversing the operating range of a Beltpack.
This feature is started in the Beltpack Menu '**Service** > **Test** > **Walk Test (Pro)**'.

While the Walk Test (Pro) is being performed, the display continuously shows measurement results. Even if the main view of the display is not visible, the keys (1-6) retain their original functionality. This means that calls can be made or stopped and volume changes can be made while the Walk Test data is displayed at the same time. The Reply key is an exception, as it is used to end the range test and therefore does not have the same functionality as in the main view.

> If the Beltpack Monitoring feature is enabled, the Beltpack user can forcefully generate a special measurement (including a marker) by pressing the menu key. The gathered data (including the markers) is presented in the Beltpack information view in the Web Interface (⇨Info (Beltpacks) > Radio Monitoring).

Walk Test

Depending on whether it is a DECT or 2.4GHz-Beltpack, different readings can be seen:

- For DECT Beltpacks, the walk test displays the current signal strength and signal quality of the Antenna to which the beltpack is connected.
- ***New in 3.1***
  For 2.4GHz-Beltpacks, the Walk Test displays the interference level of all carrier frequencies in green, yellow, orange and red. In addition, the currently used carrier frequencies are displayed with a stripe. Furthermore, the radio and audio error rate for the receive and transmit direction, as well as the number of retransmitted packets are displayed.

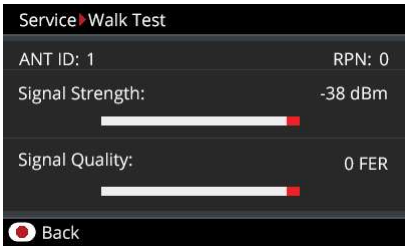


Figure 190: Walk Test (DECT Beltpacks)

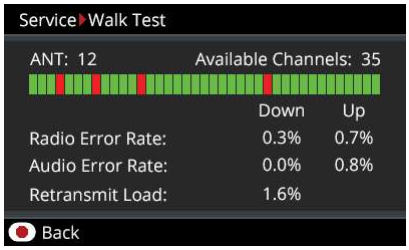


Figure 191: Walk Test (2.4GHz-Beltpacks)

DECT-Antennas	
ANT ID	Antenna ID number.
RPN	Unique number for the Antenna in the network space. The Antenna with RPN 0 is always the Master.
Signal Strength	Current signal strength.
Signal Quality	Current signal quality.
FER	Current number of errors.

2.4GHz-Antennas	
ANT	Antenna ID number.
Available Channels	Number of available channels.
Interference Level	Shows all carrier frequencies in green, yellow, orange and red.
Radio /Audio Error Rate	Radio and Audio error rate for the receive and transmit direction.
Retransmit Load	Number of retransmitted packets.

Walk Test Pro

The Walk Test Pro displays the signal levels of all Antennas that are within sight of the Beltpack. The Antenna to which the Beltpack is connected is highlighted.
There are no differences between the DECT and 2.4GHz-Beltpacks in the Walk Test Pro.

Figure 192: Walk Test Pro (DECT & 2.4GHz-Beltpacks)

ANT	Antenna ID number.
RPN	Unique number for the Antenna in the network space. The Antenna with RPN 0 is always the Master.
Signal	Average number of receive signal strength. The value may vary due to fading.
Busy	Shows if the Antenna is full occupied by Beltpacks.
Error (downlink)	Average number of detected errors in the link from the Antenna to the Beltpack (e.g. sync error or CRC).
Error (uplink)	Average number of detected errors in the link from Beltpack to Antenna.
Phase	Phase difference from the Antenna, the Beltpack is connected to, and a secondary Antenna. This number has to be below ±2. If it is outside this range, the clock in the network is not in sync. In this case, handover will not be possible as the Beltpack cannot see other Antennas anymore. The Beltpack clock is always synchronized to the clock of the connected Antenna.
AM	If an Antenna with an 'Advanced Monitoring' license is present in Bolero-Net, the number of available channels and frequencies is displayed in the bottom line.

3.5.13 Reset

The Beltpack-Menu '**Service** > **Reset**' offers two different ways to reset the Beltpack to factory default settings.

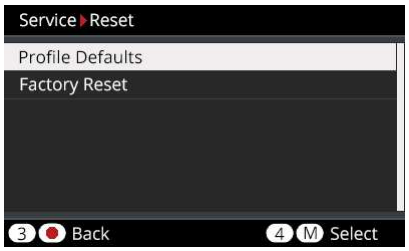


Figure 193: Beltpack menu – Reset

Profile Defaults

This resets the Beltpacks' Profile data the current default settings of the net.
All registration data stays in memory.

Factory Reset

This resets all data and settings to factory default.
All Net lists and registrations data will be deleted.

3.5.14 Opening the USB rubber cover

The USB rubber cover yields protection against ingressing dirt and water inside the Beltpack.
The rubber cover can be removed as follows:

- Turn the Beltpack's rear side upwards.
- Push your fingernail gently in the slit on the top of the rubber cover...
- and pull the rubber cover out of the Beltpack's connectors.
- Take care to seal the Beltpack when the connectors are not in use.

Figure 194: Insert fingernail

Figure 195: Pull rubber cover

3.5.15 Battery

Light and powerful custom lithium rechargeable battery packs are used to operate the Beltpacks. A good battery usually lasts about 500 full charging cycles. If the Beltpack is charged 50% every day, the battery will last for about 3 years.
Batteries can be charged in following ways:

- Beltpack (with battery) in the Bolero-Charger
- Battery (separate, without Beltpack) in the Bolero-Charger
- Beltpack (with battery) via USB device (USB plug power supply, PC/Laptop, etc.)

The charging characteristic depends on the ambient temperature and the Charger:

Temperature		Display	Bolero-Charger	USB device
<0°C	<32°F	too cold !	no charging	
0°...10°C	32°...50°F	cold	gentle charging 1.00 A / 4.06 V	gentle charging 0.50 A / 4.06V
10°...45°C	50°...113°F	normal	normal charging 1.50 A / 4.20 V	normal charging 0.50 A / 4.20 V
45°...60°C	113°...140°F	warm	gentle charging 1.50 A / 4.06 V	gentle charging 0.50 A / 4.06V
>60°C	>140°F	too hot !	no charging	

3.5.15.1 Charging via USB in the Beltpack

- Connect the Beltpack with an USB power supply or an USB connector that has a minimum current supply of 500mA.

During charging the Beltpack is still operable. The main screen shows in the top right the charge icon:

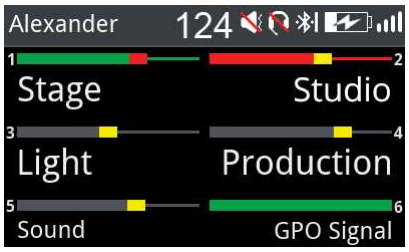


Figure 196: USB Charging view

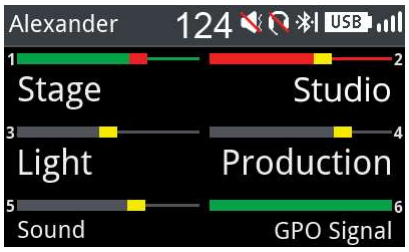


Figure 197: Fully Charged view (USB still connected)

Some USB chargers may not be compatible with Bolero Beltpacks. For example some USB chargers may charge the Beltpack with only 100mA, even though the charger is capable of providing 1A or more. The Beltpack shows an ERR in the battery symbol.

More information is displayed in the Beltpack Menu '**Service** > **Information** > **Battery**':

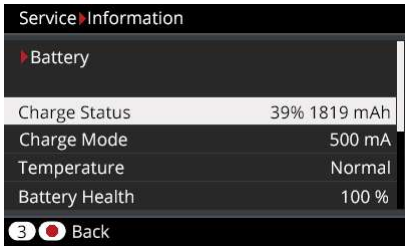


Figure 198: Charging information in the Beltpack menu

3.5.15.2 Charging in the Charger

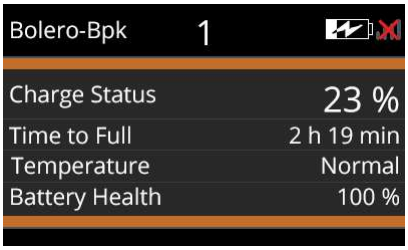
- Plug the Beltpack or just the battery itself in an empty position in the Charger.

	The radio is switched off when the Beltpack is plugged into the Charger.

- The charging procedure will start automatically.
- The corresponding slot LED indicates the charging state:

red blinking	below 20%
orange blinking	20 ... 90%
green blinking	above 90%
permanent green	100%
green, orange flashing	100%, battery life <60%

- The Beltpack's display shows the charging state.



For further information refer chapter Bolero Charger.

3.5.15.3 Replacing the Battery

The Beltpack battery can be replaced by following these steps:

- Pull the battery release button upwards...
- and push the battery at the belt clip to the bottom side of the Beltpack.
- Lift the battery upwards.
- Insert the battery in the opposite order.

Figure 199: Pull release button

Figure 200: Push battery

Figure 201: Lift battery

3.5.15.4 Removing the Belt Clip

The belt clip can be removed by following these steps:

- Pull the lock clip upwards...
- and push the belt clip to the top side of the battery.
- Insert the belt clip in the opposite order.

Figure 202: Pull lock clip

Figure 203: Push belt clip

3.5.16 Firmware Update

It is possible to update the firmware of up to five Beltpacks in one Bolero-Charger. As long as a USB flash drive with valid firmware package is connected to the Charger, the Charger functions as an update station. The Beltpacks are charged simultaneously while updating.

A step-by-step guide for the update can be found in chapter 'Bolero Charger > Firmware Update'.

3.6 Bolero Beltpack Cover

The Beltpacks can be individualized by colored covers, which will be clipped over the display.

Color	Product code
black	BL-BPK-COVER-BLACK
blue	BL-BPK-COVER-BLUE
gray	BL-BPK-COVER-GRAY
green	BL-BPK-COVER-GREEN
red	BL-BPK-COVER-RED
violet	BL-BPK-COVER-VIOLET
white	BL-BPK-COVER-WHITE
yellow	BL-BPK-COVER-YELLOW

3.7 Technical Drawing

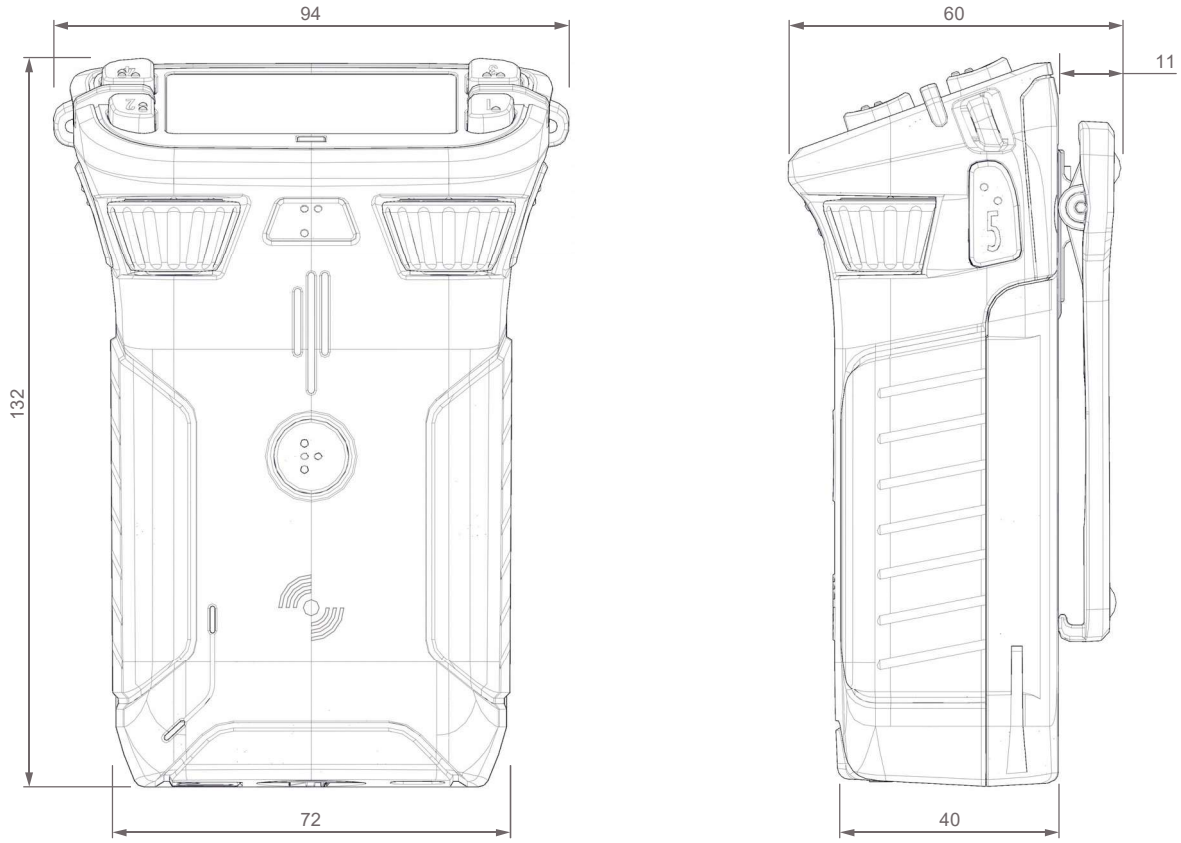


figure 204: Beltpack (front, right), dimensions in millimeter

3.8 Technical Specifications

Beltpack Product Code	DECT	BL-BPK-1006-19
	2.4GHz	BL-BPK-1006-24
Multi-path delay spread protection	Yes, ADR (Advanced DECT Receiver)	
Audio Bandwidth	200 Hz ... 7 kHz (-3dB)	
Mode of Operation	Full-duplex on all routes	
Encryption	AES256 Bit encryption	
Line Input	3.5 mm jack, 40 Hz ... 20 kHz, max. +12 dBu input level (local audio mix only)	
Talk Controls	4x push buttons + 1x reply key + 2x walkie-talkie keys (PTT, Latching & Auto mode)	
Volume / Level Controls	2x rotary encoders + menu navigation	
Display	High contrast sunlight readable full color LCD	
Audio prompts	Out of range, Bluetooth connected / disconnected, battery low, volume change, Beltpack registered / deregistered / not connected	
Number of Full-Duplex Audio Paths	6 with individual level control	
Handheld Operation	Walkie-talkie mode	
Vibrate Module	Programmable vibrate indicates incoming calls, low battery, out of range and other notifications.	
Internal Loudspeaker	Freq. <500Hz ... >7kHz 80dB/SPL/0.5W/1m, @ <5% THD	
Remote Health Monitoring	Battery charge status, via web browser	
Battery	Lithium Ion external removable battery pack with user removable clip	
USB Charging	USB Type-C connector for Beltpack charging.	
Operation Time	~17 hours typical	
Headset Connector	4-pin male XLR, user replaceable	
Microphone Type	Electret (~5V bias voltage) or dynamic, user selectable or automatic	
Side-tone and microphone gain	Individually adjustable for each Beltpack & via remote control	
Bluetooth	V4.1 (HFP - hands free profile, HSP - headset profile, A2DP - streaming profile) ***New in 3.1*** Bluetooth is not supported for 2.4GHz-Beltpacks.	
Bluetooth phone call mix into intercom	Yes	
Lanyard anchor points	Yes	
Dimensions	Width	86 mm / 3.4"
	Height	130 mm / 5.1"
	Depth	48 mm / 1.9"
Weight	420 g (incl. battery and clip)	
Environmental	IP-65 environmental sealing; protected against dust ingress and water spray from all angles (with XLR connector plugged in)	
Operating Environment	Temperature	-10° ... +40°C (device operating up to 55°C)
	Humidity	0 % ... 90 % rel. (non-condensing), Ta=40°C
Storage Temperature	-20° ... +50°C (long term) / -20° ... +60°C (short term)	

4 Bolero S-Beltpack

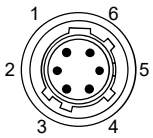
The Bolero Wireless S-Beltpack is a very light and compact, digital station with six individually configurable keys for intercom, IFB or GPO triggering use. Two of the keys are able to allow volume-control for each key. Pushing the Talk key toggles talk on/off with momentary or latching operation as well as an Auto mode that combines both functions in one. Activation is indicated by an LED. A vibration motor is able to indicate an incoming call or warnings.
With the new "Touch&Go" Beltpack registration a quick and user-friendly registration is implemented. Just touch the Beltpack to the Antenna and GO.
The Bolero Wireless S-Beltpack has a 6-pin Hirose HR10 socket for headset and a USB port for firmware updates. A fully charged Bolero-S-Beltpack allows more than 7 hours of operation. The rugged housing houses the internal Antennas.

4.1 Operating Elements

Figure 205: S-Beltpack – Operating Elements (front/top, rear/bottom)

A	Key 2 (channel 2, top)
B	Lanyard or safety cord mounting holes
C	NFC contact point
D	Headset connector (Hirose)
E	Key 1 (channel 1, top)
F	Key 3 (channel 3, side)
G	Key 5 (volume down, side)
H	Charging contacts
I	Beltclip (optional)
J	Screw head mount and bottle opener
K	Power button
L	USB Type-C (underneath a rubber cover)
M	Key 6 (volume up, side)
N	Key 4 (channel 4, side)

Hirose (male)



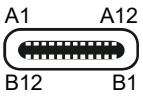
Pin	Description	Pin	Description
1	Microphone + (+5 VDC)	4	Microphone - (shield)
2	PTT (GND)	5	PTT (signal)
3	Earphones +	6	Earphones -

Figure 206: Hirose male

The headset connector is a 6-pole male Hirose connector and supports mono headsets with electret or dynamic microphones, depending on the menu setting.

The microphone power (+5 VDC) will be switched on if the menu setting '**Audio** > **Headset Type**' is set to **Electret**, **Electret detect** or **Auto** and an electret microphone is attached.

USB Type-C



Pin	Description	Pin	Description
1	GND	7	Dn1
2	SSTXp1	8	SBU1
3	SSTXn1	9	VBUS
4	VBUS	10	SSRXn2
5	CC1	11	SSRXp2
6	Dp1	12	GND

Figure 207: USB Type-C

The USB connector is used to charge the Beltpack.

Charging is only possible with >500 mA USB ports. 100 mA are not supported.
The charge current is limited to 500 mA by the Beltpack.

4.2 Status LEDs

Figure 208: S-Beltpack – Status LEDs (top)

1	**Status**	***off***	Beltpack is turned off
		green	• Beltpack ready (System ok) • Beltpack off, USB charging, battery full
		green blinking	USB charging, battery level >90%
		red	• Booting • Beltpack not registered/not connected • Low battery level (<15%) • Outside the Antenna coverage area
		red blinking	Critical battery level (<8%)
		red fast blinking	Critical error (no function)
		orange	Mic unmuted, Sidetone on
		orange blinking	USB charging, battery level <90%
		orange fast blinking	Locate function active
		orange-red blinking	• Beltpack not registered, USB charging, battery level <90% • Beltpack registered, Mic unmuted, Sidetone on, critical battery level (<8%)
		green-red blinking	Beltpack not registered, USB charging, battery level >90%
2	**Call**	***off***	No active call
		green	Incoming call
		green blinking	Volume changing
		red blinking	Beltpack not registered/connected
		orange	Outgoing call
		orange blinking	Incoming indication (beep)

4.3 Key Functions

While the green status LED indicates ready for operation, users may talk individually or at the same time to all channels.
Pushing one of the four keys allows talking in the respective channel.
The respective Call LED is indicating if one channel is active at least.
The keys 1 to 4 are latching. Push again the key to deactivate the respective channel.
The keys 5 and 6 (-/+) allow adjusting the master volume of the channels.

	The key mode (Latching / PTT) is set in Director if the system is set to **Integrated/Artist** mode. For a new configuration in Director, all 6 keys are in PTT mode by default.

4.4 Battery

Light and powerful custom lithium rechargeable battery packs are used to operate the S-Beltpacks.
Bolero S-Beltpacks have half of the capacity of standard Bolero Beltpacks.

Batteries can be charged in following ways:

- S-Beltpack in the Bolero-Charger
- S-Beltpack via USB device (USB plug power supply, PC/Laptop, etc.)

The charging characteristic depends on the ambient temperature and the Charger:

Temperature		**Display**	**Bolero-Charger**	**USB device**
<0°C	<32°F	too cold !	no charging	
0°...10°C	32°...50°F	cold	gentle charging 1.00 A / 4.06 V	gentle charging 0.50 A / 4.06V
10°...45°C	50°...113°F	normal	normal charging 1.50 A / 4.20 V	normal charging 0.50 A / 4.20 V
45°...60°C	113°...140°F	warm	gentle charging 1.50 A / 4.06 V	gentle charging 0.50 A / 4.06V
>60°C	>140°F	too hot !	no charging	

4.4.1 Charging via USB

- Connect the S-Beltpack with an USB power supply or an USB connector that has a minimum current supply of 500mA.

During charging the S-Beltpack is still operable. The status LED shows the charging information.

S-Beltpack connected:

	orange blinking	below 90%
	green blinking	above 90%

S-Beltpack not connected:

	orange/red blinking	below 90%
	green/red blinking	above 90%

Some USB chargers may not be compatible with Bolero S-Beltpacks. For example some USB chargers may charge the S-Beltpack with only 100mA, even though the charger is capable of providing 1A or more.

4.4.2 Charging in the Charger

- Plug the S-Beltpack in an empty position in the Charger.

	The radio is switched off when the S-Beltpack is plugged into the Charger.

- The charging procedure will start automatically.

The corresponding slot LED indicates the charging state:

	red blinking	below 20%
	orange blinking	20 ... 90%
	green blinking	above 90%
	permanent green	100%
	green, orange flashing	100%, battery life <60%

For further information refer chapter Bolero Charger.

4.5 External PTT

Two buttons (External Keys) via the headset socket are supported. These External Keys are used to "remote control" other keys on the Beltpack. In addition to the existing key modes (Momentary, Latching, Auto), two new modes can be configured for the external keys:

- On only
- Off only

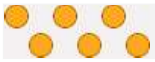
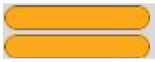
The configuration for these External Keys can be found in the **Rotaries** tab in the 'Beltpack Configuration' and 'Profile Configuration' views.

Note that the Beltpack hardware has to support the headsets with External Keys (currently the standard Bolero Beltpack BL-BPK-1006-19 does not support this feature, only the Bolero S Rev. 12.00 (or higher) Beltpack can be used with External Keys at the moment).

4.6 Firmware Update

It is possible to update the firmware of up to five S-Beltpacks in one Bolero-Charger. As long as a USB flash drive with valid firmware package is connected to the Charger, the Charger functions as an update station.

New in 3.1 Since S-Beltpacks do not have a display, the update information is indicated via the key LEDs 1+2:

	green (on for 15 seconds, then off)	S-Beltpack runs with the current firmware
	orange alternately blinking	Firmware update in progress
	orange	Update in progress during reboot
	green	Update successfully completed
	red flashing 2x	Update error

The S-Beltpacks are charged simultaneously while updating.
The charging status is displayed via the respective slot LED. (⇨Charging in the Charger).

A step-by-step guide for the update can be found in chapter 'Bolero Charger > Firmware Update'.

4.7 Technical Drawing

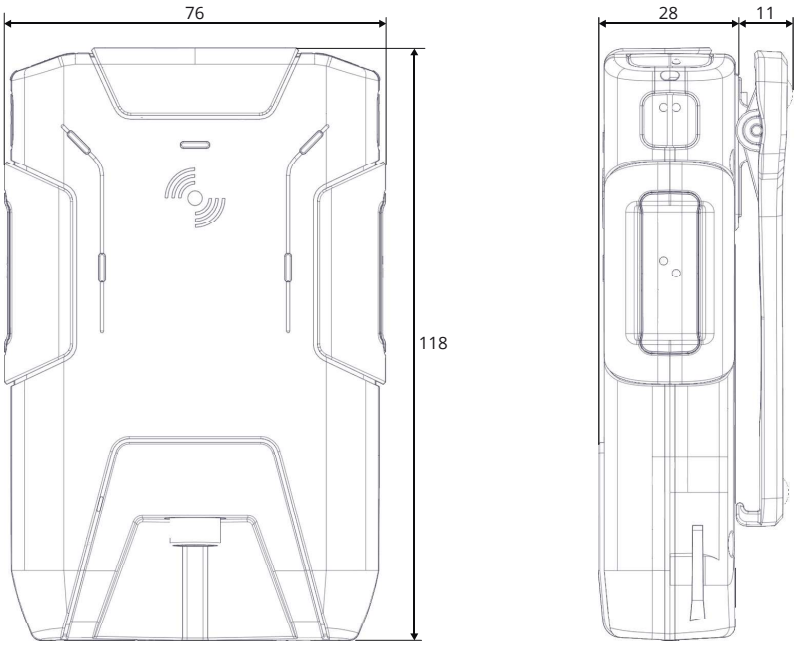


figure 209: S-Beltpack (front, right), dimensions in millimeter

4.8 Technical Specifications

Beltpack Product Code	BL-BPK-1004-19, BL-BPK-1004-24	
Multi-path delay spread protection	Yes, ADR (Advanced DECT Receiver)	
Audio Bandwidth	200 Hz ... 7 kHz (-3dB)	
Mode of Operation	Full-duplex on all routes	
Encryption	AES256 Bit encryption	
Line Input	No	
Talk Controls	4x push buttons (momentary, latching & auto mode) + 2 volume keys	
Volume / Level Controls	Volume keys programmable	
Display	No	
Audio prompts	Out of range, Battery full, Battery good, Battery low, Beltpack registered	
Number of Full-Duplex Audio Paths	4 with individual level control	
Vibrate Module	Vibrate indicates incoming call or silent call is active	
Remote Health Monitoring	Remote via Antenna and computer (Battery remaining time)	
Battery	Lithium Ion internal battery	
USB Charging	USB Type-C connector for Beltpack charging.	
Operation Time	~7 hours typical	
Headset Connector	6-pin male Hirose HR10	
Microphone Type	Electret (~5V bias voltage) or dynamic, user selectable or automatic	
Side-tone and microphone gain	Individually adjustable for each Beltpack & via remote control	
Bluetooth	V4.1 (HFP - hands free profile, HSP - headset profile, A2DP - streaming profile) ***New in 3.1*** Bluetooth is not supported for 2.4GHz-Beltpacks.	
Beltclip	Yes, user removable clip (optional)	
Lanyard anchor points	Yes	
Environmental	IP-65 environmental sealing; protected against dust ingress and water spray from all angles	
Storage Temperature	-20° ... +50 °C long term; -20° ... +60 °C short term	
Environment Temperature	-10° ... +40°C (device operating up to 55°C)	
Humidity	0 % ... 90 % rel. (non-condensing), Ta=40°C	
Dimensions	Width	76 mm / 3.0"
	Height	118 mm / 4.6"
	Depth	28 mm / 1.1"
Weight	165 g / 5.82 oz (without clip)	

5 Bolero Antenna

When used with Artist, Bolero active Antennas run over a standard AES67 IP network. Up to 100 Antennas and 250 Beltpacks are able to connect to a system. The intelligent and highly efficient use of bandwidth results in 10 Beltpacks per Antenna. The decentralized Antennas allow the use of existing standard structured cabling and provide a wide area between the Antennas connected to AES67 capable switches and the Artist frames equipped with AES67 client cards. This provides a fully integrated point-to-point roaming intercom ecosystem. The more decentralized Antennas added, the more robust the network becomes. The Antenna is powered via Power-over-Ethernet (PoE+), simplifying installations by eliminating local power supplies or alternatively via a separate DC supply.

When used in Standalone/Link application, Antennas can be used individually, in a ring structure, or daisy-chained as the situation demands. Also, up to 100 Antennas and 128 audio channels (Beltpacks and NSA-002A) can be integrated into a single system. These Antennas can be placed up to 300 meters apart and up to five can be powered via the CAT5 network using a new external PSU. The system is quickly and easily configured over the IP connection using a web browser. Finally, a throw-down box can be used to interface the standalone Bolero with other intercom systems via 4-wire.

	The radio operation is disabled by default for Antennas configured for countries outside Europe and may only be activated in the respective countries. This is done in the web interface of the respective Antenna: **Antennas** > Edit () > **Antenna RF** (). (⇨'Edit (Antennas)')

New in 3.1 The Bolero product portfolio has been expanded by a 2.4GHz type Antenna and Beltpack that operate exclusively in the 2.4 GHz range.
Each 2.4GHz-Antenna supports up to eight 2.4GHz-Beltpacks. The different Antenna types (2.4GHz and DECT) can be added to the same Network Space. 2.4GHz-Antennas can be configured and used in the same way as DECT-Antennas. The different Antennas can even be used in the same Standalone/Link ring topology. The 2.4GHz-Antennas have the same (remote) power capabilities as the DECT-Antennas. The Beltpacks also work the same, but 2.4GHz-Beltpacks will only connect to 2.4GHz-Antennas and DECT-Beltpacks will only connect to DECT-Antennas. Talking from a 2.4GHz-Beltpack to a DECT-Beltpack or vice versa works as long as they are both in the same Network Space or connected to the same Artist net.

5.1 Operating Elements

Figure 210: Antenna Operating Elements (front, bottom)

A	E-ink display
B	Navigation buttons (cursor and menu button)
C	NFC contact point
D	Kensington Security Slot
E	DC power supply connector (XLR-4)
F	Mounting element (spigot, 3/8" & 5/8" microphone stand mounting)
G	AES67/Config connector (RJ45, 1GBit)
H	LINK connector 1 (RJ45)
I	LINK connector 2 (RJ45)
J	USB connector (USB Type-C)

XLR-4 (male)

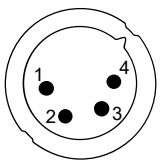


Figure 211: XLR-4 male

Pin	Description
1	-PWR
2	Chassis
3	Data
4	+PWR (10...57 VDC / 3 A)

The length of the DC power cable should not exceed 1.5 meters.

RJ45

Pin	AES67/Config	LINK 1+2
1	D1+ / PoE+ (p)	D1+
2	D1- / PoE+ (p)	D1-
3	D2+ / PoE+ (n)	D2+
4	D3+ / PoE+ (p)	D3+
5	D3- / PoE+ (p)	D3-
6	D2- / PoE+ (n)	D2-
7	D4+ / PoE+ (n)	D4+
8	D4- / PoE+ (n)	D4-

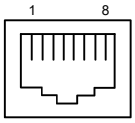


Figure 212: RJ45

1Gbit Ethernet connection is necessary to operate the Bolero net.

Standalone/AES67 Mode & Integrated/Artist Mode

- The AES67/Config port is connected to the IP net (which also hosts the Artist card in **Integrated Artist mode**).
- The other two ports are not used. If they are connected anyway, an error will be issued and radio transmission will be disabled.

	Cable requirements: Cat-5e / Cat-6 or better (according to ISO/IEC 11801), S/FTP or better, up to 100 m. Make sure ISO/IEC specification applies for the used length of the cable (in particular attenuation).

Standalone/Link Mode

- The AES67/Config port is primarily used as config port, i.e. to provide a connection to the Web-UI.
- One can also directly attach up to two IO Devices (NSA-002A) to this port in a daisy chain as well.
- Link-1 and Link-2 are used to interconnect the Antennas in a daisy chain ("open") or ring ("closed") topology.
  - A closed topology provides redundancy:
    either **one** cable in the ring can be detached without interrupting audio transmission.
  - In an open topology there's no more redundancy:
    if a cable is detached, the affected nodes cannot be reached any more.
- Link-1 on the local device must always be connected to Link-2 on the remote device (and vice versa).
- CAT cables with a maximum length of 300 meters are supported.
- With an External Power Supply (EPS), you can power up to 5 Antennas:
  2 Antennas over each Link-1 and Link-2 and the center Antenna with the EPS attached.
- It is not possible to use routers, switches or other standard IP devices.

	Cable requirements: Cat-5e / Cat-6 or better (according to ISO/IEC 11801), S/FTP or better, up to 300 m. Make sure ISO/IEC specification applies for the used length of the cable (in particular attenuation). The cable resistance between two Antennas shall below 17 Ohm.

USB Type-C

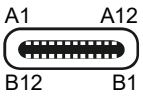


Figure 213: USB Type-C

Pin	Description	Pin	Description
1	GND	7	Dn1
2	SSTXp1	8	SBU1
3	SSTXn1	9	VBUS
4	VBUS	10	SSRXn2
5	CC1	11	SSRXp2
6	Dp1	12	GND

5.2 Status LEDs

Figure 214: Antenna – Status LEDs (front, bottom)

1 **Status**	***off***	Not powered
	green	Antenna in operation (radio enabled)
	orange	Antenna in operation (radio disabled)
	orange blinking	Antenna is powering up
	red blinking	Antenna is powering down / firmware not running
2 **Power**	***off***	No XLR input power
	green	XLR input power ok
3 **AES67-PoE**	***off***	No PoE+ input power
	green	PoE+ input power ok
4 **AES67-LNK**	***off***	no Ethernet connection present
	green	Ethernet link ok
5, 7 **LINK-PWR**	***off***	No remote power (neither outgoing nor incoming).
	orange	Remote power is provided to power other Antennas (outgoing power).
	green	The Antenna uses remote power as main power-supply (incoming power).
6, 8 **LINK-LNK**	***off***	No LINK connection present
	green blinking	LINK connection ok
	orange	Authentication denied: This occurs when protocol versions of the connected Antennas do not match. It is required to run the same firmware version on all devices.
	orange blinking	Linkup is pending: Another network space is connected to the Antenna. You can choose to join the local and remote nets.
	red	LINK connection failure: A link has been connected to the same link on another Antenna. (E.g. local Link 1 → remote Link 1). Notice that Link 1 must always be connected to Link 2 (and vice versa) on the remote node.
	red blinking	The connected Antennas do not run the same firmware version.
9 **USB**	***off***	No USB input power
	green	USB input power ok
	red	USB input power out of range

5.3 Basic Operation

5.3.1 Startup

The Antenna starts automatically after it is attached to power. The Antenna can be powered either by a separate power supply (EPS-1001) or by a switch with PoE+ functionality. In Standalone/Link mode, the power supply can also be provided by the high-performance power supply unit (EPS-1005).
The Antenna displays relevant information both after startup in the Main-View and when the device is switched off:

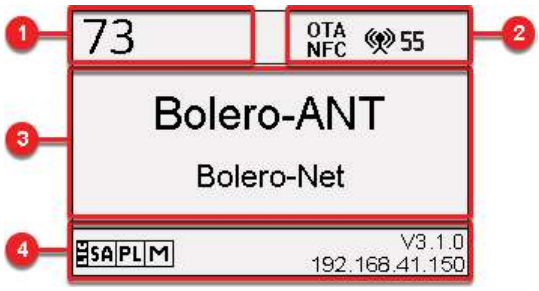


Figure 215: Main-View

Figure 216: unpowered

1	unique ID of the Antenna		73
2	Registration mode enabled		OTA NFC
	Connection to the Net via **AES67** connector	Total number of Antennas in the Net.	55
	Connection to the Net via **LINK** connectors (daisy-chain without redundancy)		55
	Connection to the Net via **LINK** connectors (ring with redundancy)		55
	Warning symbol (optional)		⚠
3	Name of the Antenna		Bolero-ANT
	Name of the Net		Bolero-Net
4	Installed License (Standalone, Extended Partyline, Monitoring))		SA PL M
	Firmware version of the Antenna		V3.0.0
	IP address of the Antenna		192.168.41.150
5	Riedel logo with serial number of the Antenna		RIEDEL SN: 3301006170085

5.3.2 Key Functions

The five buttons right beside the display allows displaying system information or editing basic settings. Press any key to enter the Main Menu. The general key functions are as follows:

	• Select the previous menu item • Increase values
	• Select the next menu item • Decrease values
	• Back to parent menu item • Move selection to the left
	• Move selection to the right
	• Enter selected menu item

5.4 Main Menu

The Main-Menu is opened by pressing any key.
Information are displayed and basic settings can be modified:

System Mode *1	Selection of the System mode of the Net. (**Standalone/AES67**, **Standalone/Link**, **Integrated/Artist**)		
IP Settings	**Mode**	Allows setting the mode of IP address: **Static**, **DHCP**, **Auto IP**	
	IP	Allows setting the IP4.0 address.	If the Mode is set to **Static**.
	Netmask	Allows setting the IP4.0 netmask.	
	Gateway	Allows setting the IP4.0 gateway.	
Registration *1	Configuration and activation of the registration mode for Beltpacks.		
	OTA	If enabled, Beltpacks are allowed to register via radio to this Net.	
	NFC	If enabled, Beltpacks are allowed to register via Antenna NFC to this Net.	
	Admin PIN (OTA)	If activated (**On**), the *Amin PIN* must be entered for registration in the Beltpack.	
	Timeout	Setting of the time in minutes after which the registration is deactivated. When disabled (**Off**), the Antenna remains in registration mode until it is exited.	
Display	**Upside/Down**	In the activated upside/down mode (**On**), the display is mirrored horizontally.	
Information	**Antenna Info**	Displays Antenna information:	
		Name	Name of the Antenna.
		User ID	User-ID of the Antenna.
		Net	Name of the Net.
		Master	Indicates whether the Antenna is Sync-Master. (**Yes**, **No**)
		Antenna RF	Indicates whether the radio signal of the Antenna is **Enabled** or **Disabled**.
		Area	Display of the region. (**Europe**, **US/Canada**, **South America**, **Brazil**, **Japan**, etc.)
		RF Strength	Display of radio power (**Normal**, **Low**, **Ultralow**).
		Local BPs	Number of Beltpacks connected to the Antenna.
		Eth Speed	Speed of the Ethernet interface.
	Net Info	Displays Net information:	
		Name	Name of the Net.
		Sys-Mode	System mode of the Net. (**Standalone/AES67**, **Standalone/Link**, **Integrated/Artist**)
		Antennas	Number of Antennas that are existing in the Net.
		Master	Name of the Antenna that is Sync-Master.
		RF Strength	Display of radio power (**Normal**, **Low**, **Ultralow**).
		Conn. BPs	Number of Beltpacks connected to the Net.
		Reg. BPs	Number of Beltpacks registered in the Net.
	System Info	Displays System information:	
		Type	Type of the Antenna.
		Serial	Serial number of the Antenna.
		MAC	MAC-Address of the Antenna.
		Package	Package version of the Antenna.
		Main PCBA	Hardware revision of the mainboard.
		Radio PCBA	Hardware revision of the radio module.
		Display PCBA	Hardware revision of the display.
		Power PCBA	Hardware revision of the power supply.

Leave Net *1	De-registration of the Antenna from the current Net.
Factory Reset *2	• Resets the Antenna to factory default settings. • All Data will be deleted!

*1 Admin PIN necessary
*2 Factory Reset PIN necessary (please consult Riedel Service)

5.5 Technical Drawing

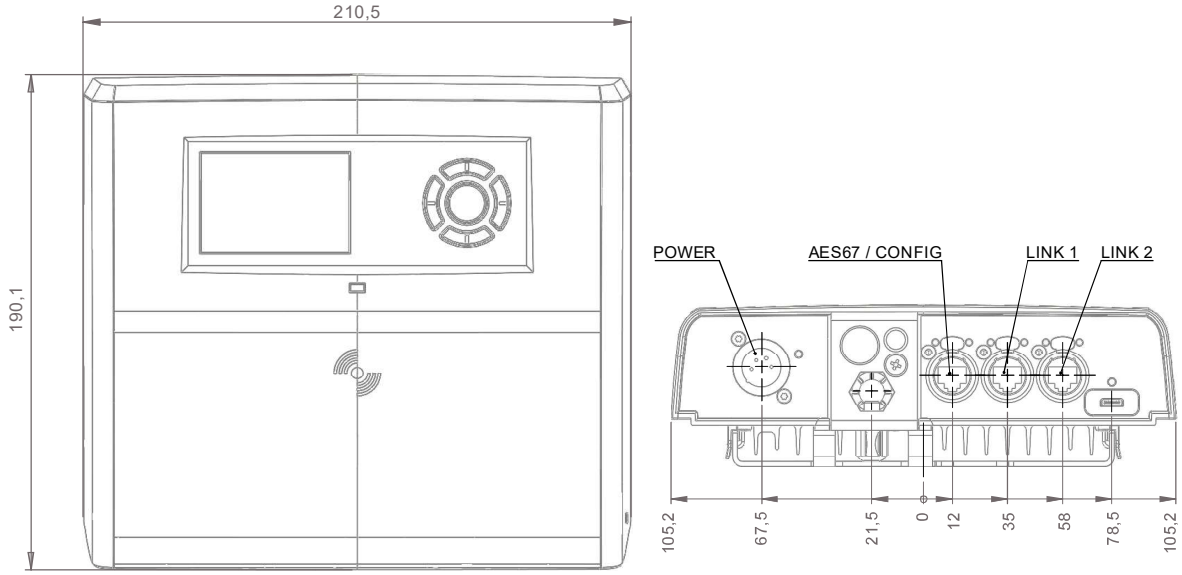


figure 217: Antenna (front, bottom), dimensions in millimeter

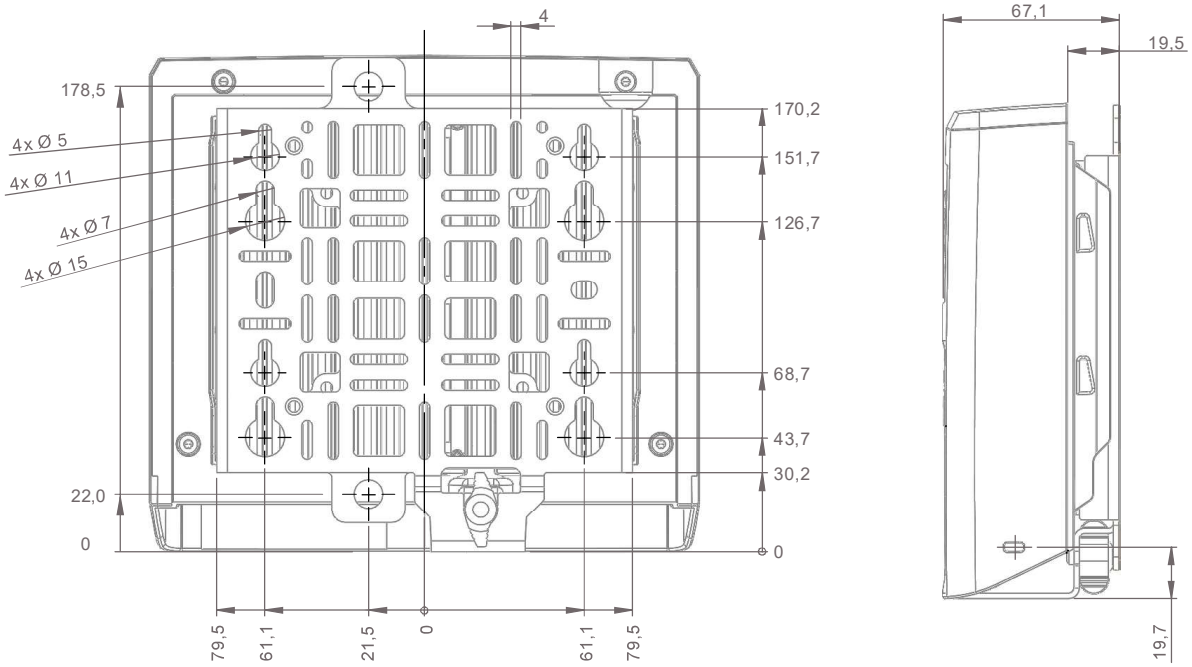


figure 218: Antenna (rear, right), dimensions in millimeter

5.6 Technical Specifications

Antenna Product Code	DECT	BL-ANT-1010-19		
	2.4GHz	BL-ANT-1008-24		
No of Beltpacks per Antenna	DECT	10		
	2.4GHz	8		
BL-ANT-1010-19: RF Frequency Range / average Power per channel	1.880 ... 1.930 GHz (region dependent, not changeable by the user)		EU	1880-1900 MHz / 10 mW
			US & CA	1920-1930 MHz / 4 mW
			JP	1894-1906 MHz / 4 mW
			BR	1910-1920 MHz / 10 mW
			LA	1910-1930 MHz / 10 mW
			MC	1880-1900 MHz / 4 mW
			TH	1900-1906 MHz / 10 mW
			MA & PH	1880-1890 MHz / 10 mW
BL-ANT-1008-24: RF Frequency Range / average Power	2.403 ... 2.479 GHz		Global	2403-2479 MHz / 4 mW
RF	Antenna Coverage		Indoor (structure dependent): max. ~200 m	
			Outdoor (free line of sight): max. ~300 ... 500 m (environment dependent)	
	Beltpack to Antenna range		Indoor (structure dependent): max. ~200 m	
			Outdoor (free line of sight): max. ~150 ... 250 m (environment dependent)	
Programmable RF Transmission power	Yes (country dependent) Maximum: 24 dBm / 250 mW, average: 10 dBm / 10 mW			
Beltpack Registration	1 touch NFC registration (Beltpack to Antenna, and Beltpack to Beltpack), OTA registration (Over The Air with PIN)			
Network Connection	AES67-IP or proprietary CAT5 for long range (300 m) non IP mode (Daisy chained and closed ring)			
	Network monitoring on Antenna		display IP, daisy chain, closed ring	
	Support of Layer 3 networks		yes	
	TTL Settings		Adjustable multicast TTL (1 to 255, default 16)	
USB Type-C Connection	Service use only			
Display Type	High contrast E-ink display			
Power Supply	PoE+ (802.3at, type 2, class 4, 15 ... 30 W) or 10 ... 57 VDC, 3 A (Bolero-Power-Supply 'BL-EPS-1001-00' or 'BL-EPS-1005-00')			
Power Consumption	15 W, 51 BTU/hr			
Mounting points	Mic stand threaded socket 5/8" & 3/8" inside, spigot adapter with wing screw lock, Kensington lock hole, screw hole for a safety wire mounting			
Dimensions	Width		210 mm / 8.3"	
	Height		190 mm / 7.5"	
	Depth		66 mm / 2.6"	
Weight	1320 g			
Environmental	IP-53 protected against limited dust ingress and water falling as a spray at an angle of up to 60° from vertical			
Operating Environment	Temperature		-10° ... +45°C	
	Humidity		0 % ... 90 % rel. (non-condensing), Ta=40°C	
Storage Temperature	-20° ... +70°C			

6 Bolero Charger

The Bolero 5-bay battery Charger has the ability to quickly and safely charge up to 5 Bolero batteries simultaneously. Light and powerful high-performance lithium rechargeable battery packs are used for the Beltpack. Battery packs are able to charge inside the Beltpack as well as separately in the 5-bay Charger.
Via the additional USB Type A and USB Type C connectors on the front side, two additional Bolero Beltpacks or any other USB devices can be charged.
Charging starts automatically after inserting the battery into a charging slot. An empty battery is charged in about 180 minutes. If a Beltpack is in the charging station, the Beltpack automatically shuts down the radio. If a Beltpack is charged via USB connector, the radio is not shut down.

It is possible to update the firmware of up to five (S-)Beltpacks in one Bolero-Charger. As long as a USB flash drive with valid firmware package is connected to the Charger, the Charger functions as an update station. The (S-)Beltpacks are charged simultaneously while updating.

6.1 Operating Elements

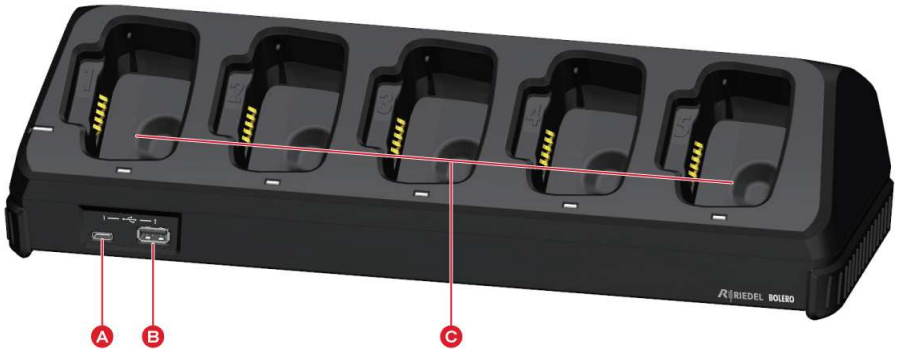
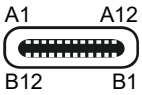


Figure 219: Charger – Operating Elements (top)

Figure 220: Charger – Operating Elements (rear)

A	USB connector (USB Type-C)
B	USB connector (USB Type-A)
C	5× charging slots for Batteries or Beltpacks
D	IEC mains connector
E	Network connector (RJ45, future use)

USB Type-C

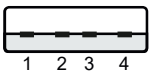


Pin	Description	Pin	Description
1	GND	7	Dn1
2	SSTXp1	8	SBU1
3	SSTXn1	9	VBUS
4	VBUS	10	SSRXn2
5	CC1	11	SSRXp2
6	Dp1	12	GND

Figure 221: USB Type-C

The USB connector is used to update the firmware and to charge an additional Bolero Beltpack or any other USB device. The maximum output current is 1.5 A.

USB Type-A

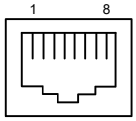


Pin	Description
1	VBUS
2	D-
3	D+
4	GND

Figure 222: USB Type-A

The USB connector is used to update the firmware and to charge an additional Bolero Beltpack or any other USB device. The maximum output current is 1.5 A.

RJ45



Pin	Description
1	D1+
2	D1-
3	D2+
4	D3+
5	D3-
6	D2-
7	D4+
8	D4-

Figure 223: RJ45

The RJ45 port supports links up to 100 Mbps and is reserved for future use.

6.2 Status LEDs

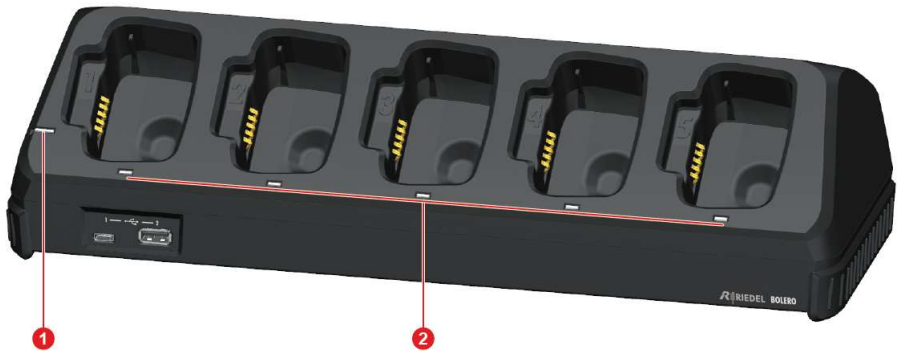


Figure 224: Charger – Status LEDs (top)

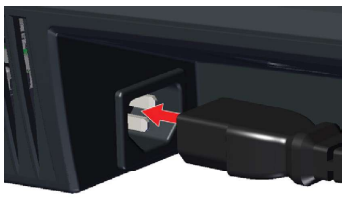
1	**System**	***off***	No input power
		orange	Booting / rebooting
		green	Charger ready
		green blinking	Firmware update of the *Charger* in progress
2	**Slot (1 … 5)**	***orange fast blinking***	Charger is reset to factory settings (all LEDs)
		off	Slot empty, not charging
		red blinking	Charging, battery level <20%
		orange blinking	Charging, battery level 20 … 90%
		green blinking	Charging, battery level >90%
		green	Battery 100% charged
		red flashing	Failure (power off)
		red	Failure (temperature too low/high)
		New in 3.1 ***green, orange flashing***	Battery 100% charged, battery life <60%

Figure 225: Charger – Status LED (rear)

3	**Ethernet**	***off***	No data connection
		green	Data connection ok
		green blinking	Data connection ok, traffic

6.3 Charging Batteries

- Connect the Charger to mains.
  The System-LED indicates the overall status.



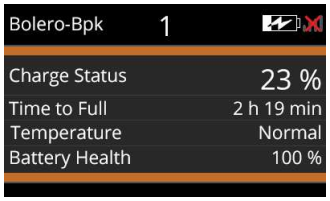
- Push the Beltpack or the battery in one charging slot.

The Beltpacks' radio is switched off when the Beltpack is plugged into the Charger.

- The charging procedure will start automatically.
- The corresponding Slot-LED indicates the charging state:

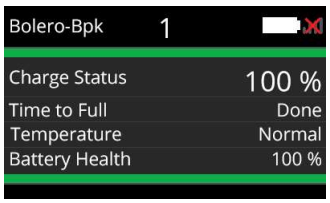
	red blinking	below 20%
	orange blinking	20 ... 90%
	green blinking	above 90%
	permanent green	100%
	green, orange flashing	100%, battery life <60%

- The Beltpack's display shows the charging state.



The charging time may double or triple if the Beltpack is either too hot or too cold.

- When the Beltpack is fully charged, the display shows the following content.
- Remove the Beltpack or battery out of the Charger.



6.4 Firmware Update

This chapter describes the update procedure of Bolero Beltpacks, S-Beltpacks and Chargers. The following devices are required:

✓ Bolero-Charger
✓ USB pen drive (Type A or Type C)
✓ Beltpack firmware package (for example "Bolero_v3.0.x.package")
✓ Bolero-Beltpacks/S-Beltpacks to be updated

It is possible to update the firmware of up to five (S-)Beltpacks in one Bolero-Charger.
As long as a USB flash drive with valid firmware package is connected to the Charger, the Charger functions as an update station. Any number of (S-)Beltpacks can be inserted into the charger, which are then updated one after another. The update process will take approximately 8 min per (S-)Beltpack.
The (S-)Beltpacks are charged simultaneously while updating.

- Connect the Charger to mains.

- Copy the new firmware package to the root directory of a USB pen drive.
- Make sure that the name starts with "Bolero" and ends with ".package".

i	Only one package is allowed to be stored in the root directory.

- Put the (S-)Beltpacks into any charging slots.
- Take care that the USB rubber cover is not pulled out.
- The charging process is independent of the update procedure and indicated by the respective slot LED.

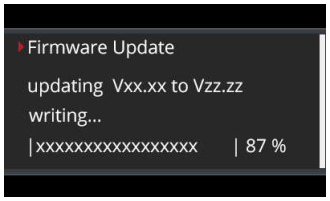
- Plug the pen drive into the respective USB slot (type A or type C) on the front side of the Charger.

- At first, the **Charger**'s firmware will be updated.
  During this process the Charger's Status-LED will blink green.
- Then the Charger will be restarted.
  During this process the Charger's Status-LED will light orange.
- The current process will be also displayed on the Beltpacks' display.

If the firmware update of the **Charger** has been completed,
the status LED of the charger lights up green permanently.

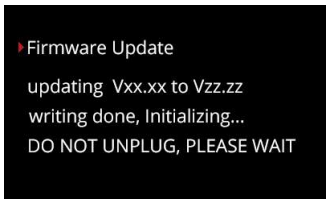
- Then, the (**S-**)**Beltpack**s' firmware will be updated.
  Beltpack:
  - The current '**(Vxx.xx)**' firmware version is shown in the display.
  - The new '**(Vzz.zz)**' firmware version is shown in the display.
  - The current process (pending, starting, erasing, writing and verifying) and a progress bar is shown in the display.

  S-Beltpack:
  New in 3.1
  - The key LEDs 1+2 are blinking orange alternately.
- The slot LED of the charger still indicates the charging status.



- Finally the (S-)Beltpack will be initialized, restarted and finalized.
  Beltpack:
  - The current '**(Vxx.xx)**' firmware version is shown in the display.
  - The new '**(Vzz.zz)**' firmware version is shown in the display.
  - The current process is shown in the display.

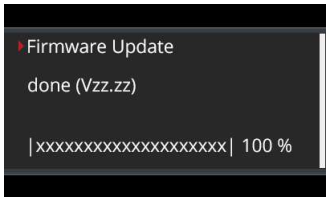
  S-Beltpack:
  New in 3.1
  - The key LED 1 or 2 is orange.
- The slot LED of the charger still indicates the charging status.



Caution: Do not remove the (S-)Beltpacks from the charging slots during this process.

- The firmware update is terminated.
  Beltpack:
  - The display shows '**done**' and the new firmware version '**(Vzz.zz)**'.

  S-Beltpack:
  New in 3.1
  - The key LEDs 1+2 are green.
- The slot LED of the charger still indicates the charging status.



	The order of plugging the Beltpacks and the USB stick doesn't matter.

It may happen that a Bluetooth update starts after removing the Beltpack from the charging slot. This will take a few minutes.

6.5 Technical Drawing

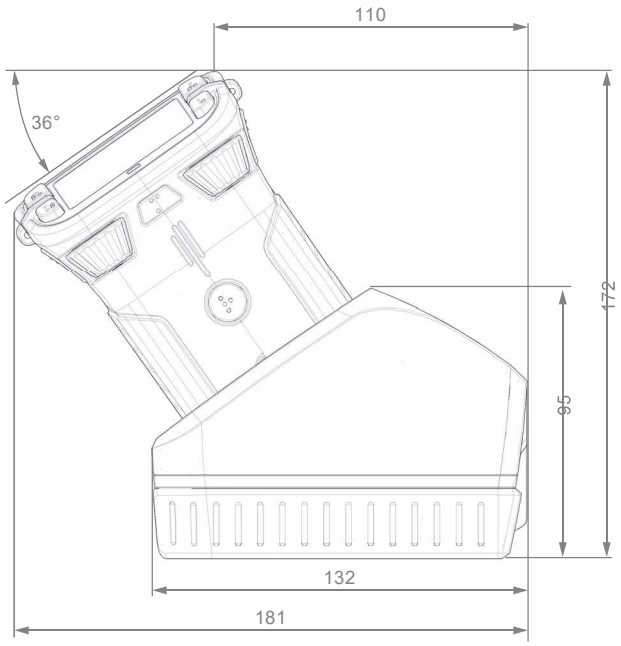


figure 226: Charger (right), dimensions in millimeter

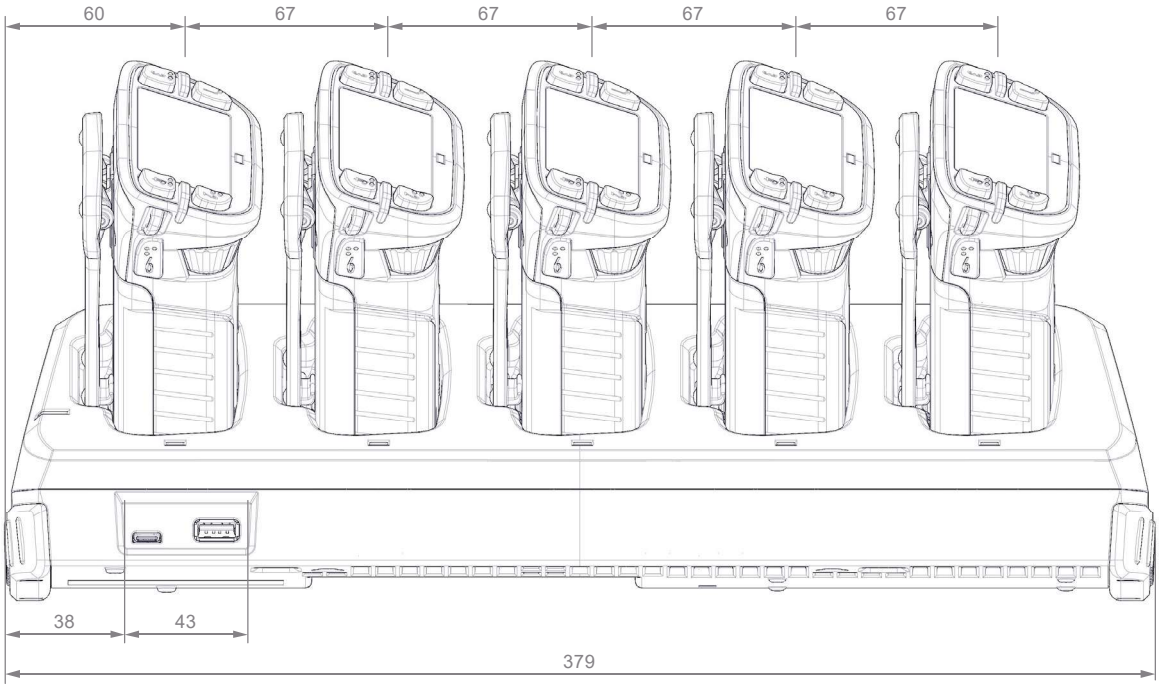


figure 227: Charger (front), dimensions in millimeter

6.6 Technical Specifications

Charger Product Code	BL-CHG-1005-R	
No of Beltpack slots	5	
Beltpack Charge Time	Up to 3 hours	
Charge status LEDs	1 per charge slot	
Beltpack Display	% charged, time to full, temperature, battery health	
USB Type-A / USB Type-C Connection	• For firmware update • For charging a Beltpack, a phone, etc. via cable • Max. 1.8 A (each port)	
Power Socket	1x IEC	
Power Supply	100 ... 230 VAC / 50 ... 60 Hz	
Power Consumption	≤60 W, ≤205 BTU/hr (charging 5 Beltpacks)	
Heat dissipation	≤20 W, ≤68 BTU/hr (charging 5 Beltpacks)	
Mounting	Stand-alone table mount, 2x wall mounts or 19” rack via optional accessory kit "BL-RMK-1002-01" (1430045)	
Dimensions	Width	380 mm / 15"
	Height	95 mm / 3.8"
	Depth	135 mm / 5.3"
Weight	1140 g	
Operating Environment	Ambient Temperature	0° ... +45°C
	Humidity	20 % ... 90 % rel. (non-condensing)
Storage Temperature	-20° ... +70°C	

7 Bolero EPS-1001

The BL-EPS-1001 is an external power supply for a single Bolero Antenna. The 2.5 m XLR power cable of the power supply is attached to the XLR power connector of the Bolero Antenna and can supply only the Antenna where the EPS-1001 is attached.
Protect the device from splash water and moisture. The housing is intended for indoor usage.
Included are four interchangeable AC plug types for Europe, US, UK and Australia.

Figure 228: BL-EPS-1001

XLR-4 (female)

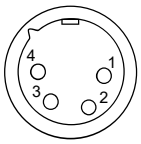


Figure 229: XLR-4 female

Pin	Description
1	-PWR
2	-
3	-
4	+PWR (12 VDC / 1.5 A)

7.1 Technical Specifications

Product code	BL-EPS-1001-00	
No of supplied Devices	1	
Input	Voltage	100 ... 240 VAC
	Frequency	50 / 60 Hz
	Current	max. 0.7 A / 100 VAC, 0.4 A / 230 VAC
Output	Voltage	12±3% VDC
	Current	1.5 A
	Power	max 18 W
Efficiency Level	86%, typical at 230 VAC full load	
Operating Environment	Ambient Temperature	-10° ... +50°C
	Humidity	20 % ... 90 % rel. (non-condensing)
Storage Environment	Ambient Temperature	-20° ... +85°C
	Humidity	10 % ... 95 % rel.
Dimensions	Width	43 mm / 1,7"
	Height	40.5 mm / 1.6"
	Depth	81 mm / 3.2"
Approvals	CE, UL, FCC, C-Tick, CCC, TÜV, CB	
Weight	150 g	

8 Bolero EPS-1005

The BL-EPS-1005 is an external high-performance power supply for Bolero Antennas in Standalone/Link mode. The 2.5 m XLR power cable of the power supply is attached to the middle of up to five Bolero Antenna and can supply two additional daisy-chained Antennas at the CAT5-Link port. The external power supply allows various mounting options like wall-mount, pole-mount and 5/8 thread. The housing is weatherproof for indoor and outdoor usage.

Figure 230: BL-EPS-1005

XLR-4 (female)

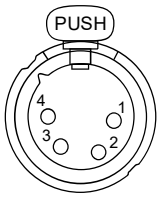


Figure 231: XLR-4 female

Pin	Description
1	GND
2	Data -
3	Data +
4	+PWR (57 VDC / 2.6 A)

8.1 Power Concept

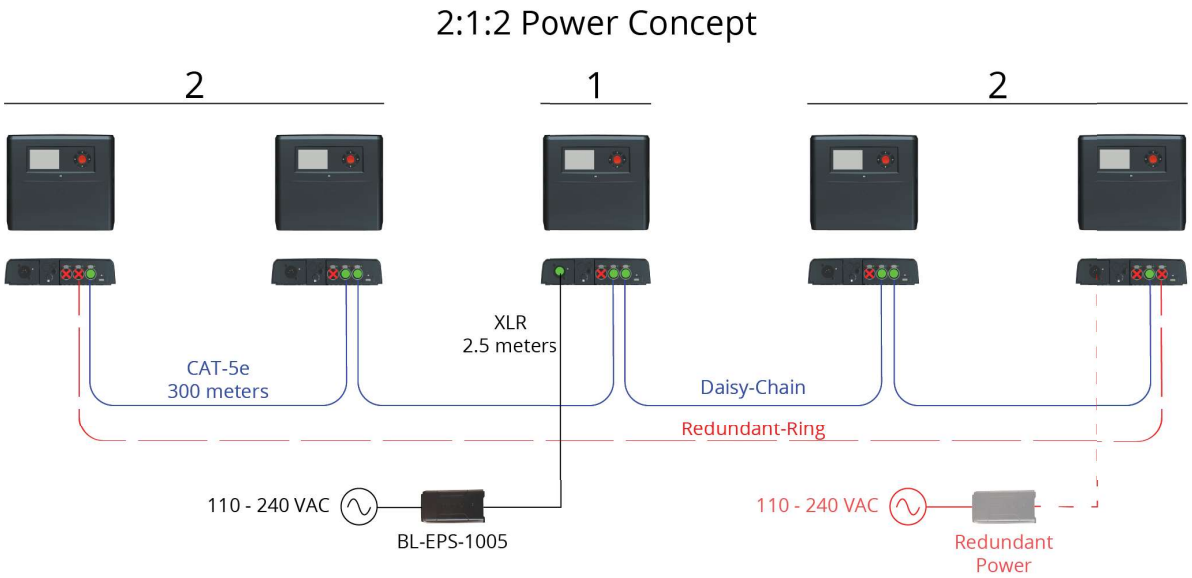


Figure 232: BL-EPS-1005 – Power Concept

Cable Type	Link: CAT-5e / Power: special XLR
Maximum Cable Length	Link: 300 m (1000 feet) / Power: 2.5 m (8 feet)
Maximum Resistance between two Antennas	17 Ohm
Maximum Remote Power Configuration	2:1:2

8.2 Status LEDs

Figure 233: BL-EPS-1005 – Status LED (top)

Figure 234: Antenna – Status LEDs (bottom)

1	**EPS-1005 Power LED**	***off***	Not connected to mains power.
		green	Power supply provides power for the connected Antenna and up to four remote Antennas.
		orange	Power supply provides power but Antenna is either not connected or did not acknowledge power for remote antennas yet.
		red	Power supply does not provide power although mains power is connected. Check cabling for shorts and power cycle device.
2	**Antenna Power LED**	***off***	No XLR input power
		green	XLR input power ok
3, 4	**Antenna LINK PWR LED**	***off***	No remote power (neither outgoing nor incoming).
		orange	Remote power is provided to power other Antennas (outgoing power).
		green	The Antenna uses remote power as main power-supply (incoming power).

8.3 Technical Drawing

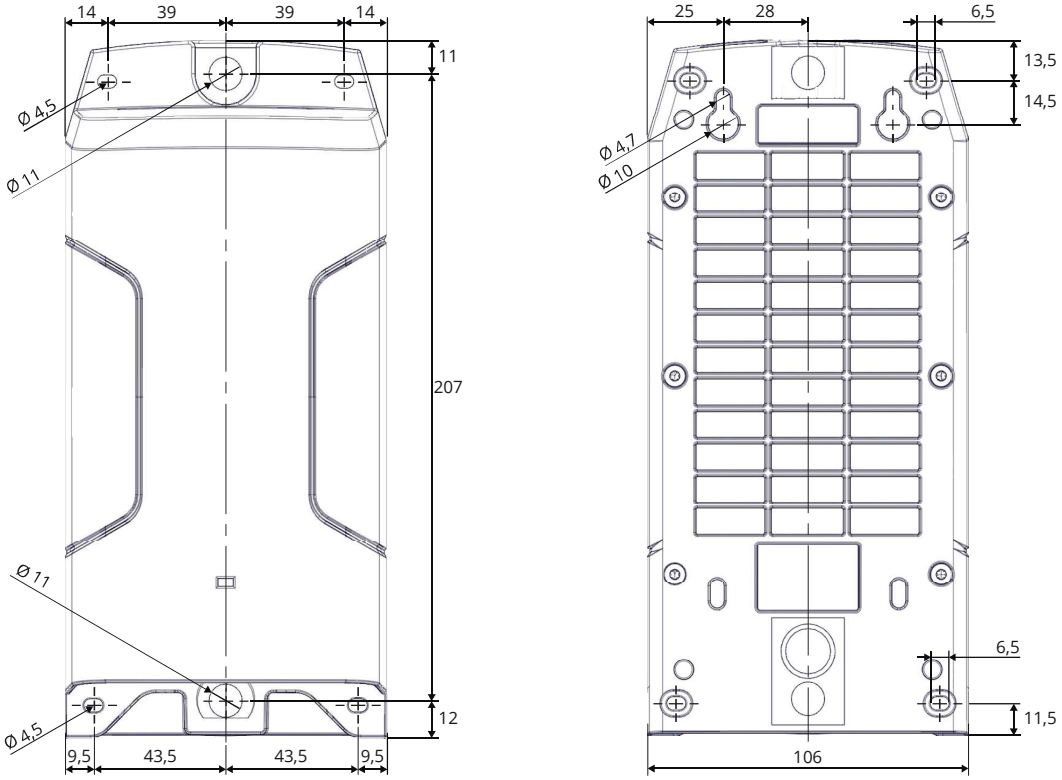


Figure 235: BL-EPS-1005 (top, bottom), dimensions in millimeter

8.4 Technical Specifications

Product code	BL-EPS-1005-00	
No of supplied Devices	5	
Input	Voltage	100 ... 240 VAC
	Frequency	50 / 60 Hz
	Current	max. 2 A / 100 VAC, 0.8 A / 230 VAC
Output	Voltage	57±5% VDC
	Current	1.5 A @ 40°C / max. 2.6 A @ 25°C
	Power	max 85 W @ 40°C / max. 150 W @ 25°C
	Cable / Connectors	Only the original XLR-4 cable may be used. The length of 2.5 meter must not be extended.
Efficiency Level	>90%, typical at 230 VAC full load	
Operating Environment	Ambient Temperature	-10° ... +40°C
	Humidity	0 % ... 90 % rel. (non-condensing)
Storage Environment	Ambient Temperature	-20° ... +85°C
	Humidity	10 % ... 95 % rel.
Dimensions	Width	106 mm / 4,2"
	Height	230 mm / 9.1"
	Depth	63 mm / 2.5"
Mounting Options	Wall mount, pole mount with clamp (not included), 5/8" thread	
Protection Class	IP53	If mounted vertically, with plugs facing downwards (XLR + IEC plugged).
	IP51	If mounted horizontally, with plugs facing sidewards (XLR + IEC plugged).
Approvals	CE, ETL, CB, FCC	
Safety	IEC62368-1 + PSE, EAC, BSMI	
Weight	1030 g	

9 Bolero Drawer

The Bolero Drawer is intended for installations in 19" racks and in which two Bolero chargers (BL-CHG-1005-R) can be placed.

9.1 Technical Drawing

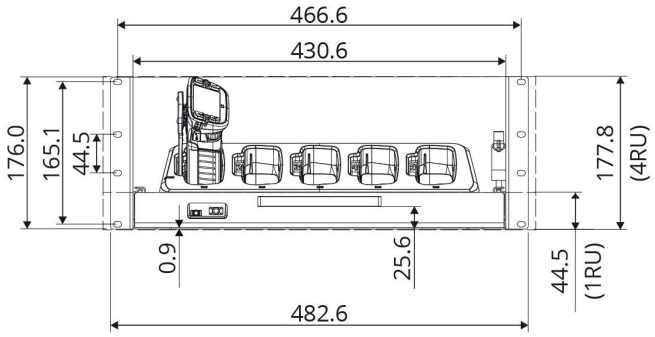


figure 236: Drawer (front), dimensions in millimeter

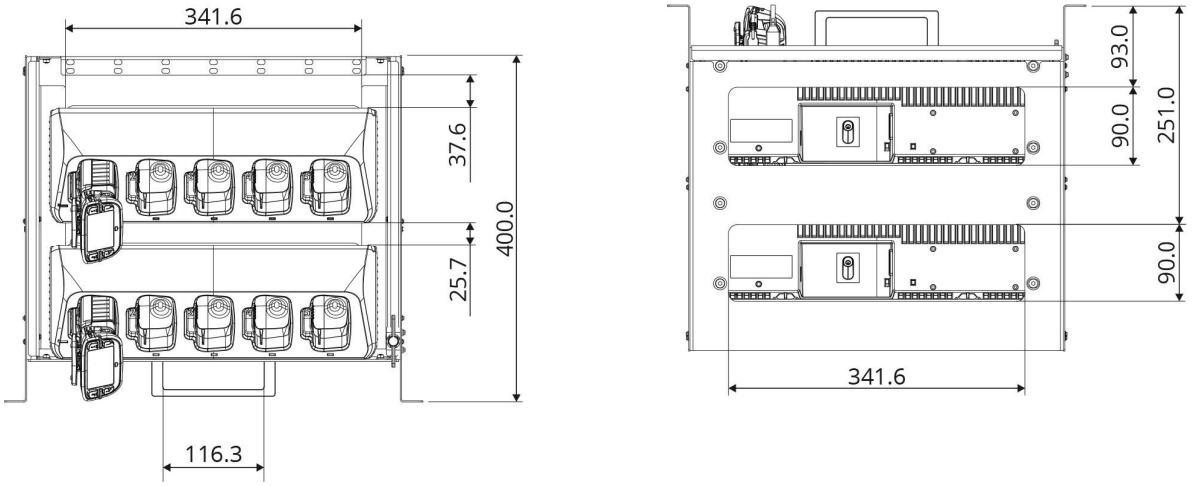


figure 237: Drawer (top, bottom), dimensions in millimeter

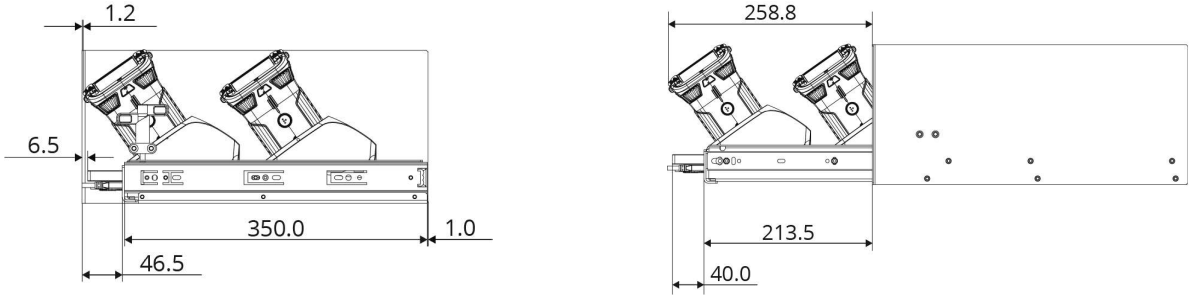


figure 238: Drawer (side retracted, expanded), dimensions in millimeter

9.2 Technical Specifications

Drawer Product code	BL-RMK-1002-00	
No of Chargers	2	
Operating Environment	Ambient Temperature	0° ... +45°C
	Humidity	20 % ... 90 % rel. (non-condensing, Ta=40°C)
Dimensions	Width	482.6 mm / 19"
	Height	177.8 mm / 7" (4RU)
	Depth	400 mm / 15.75"
Mounting options	19" rack	
Slider hold in	Rear and front position	
Slider transport lock	Yes	
Approval	CE	
Weight	4.9 kg	

10 Appendix

10.1 Glossary

ANT	Antenna
ARI	**A**ccess **R**ight **I**dentity allows identifying a system or service provider.
BL-EPS	**B**olero **E**xternal **P**ower **S**upply
BPK	Beltpack
CHG	Charger
DECT	DECT (**D**igital **E**nhanced **C**ordless **T**elecommunications) is an international standard for cordless radio communications.
DSCP	A DSCP (**D**ifferentiated **S**ervices **C**ode **P**oint) is a packet header value that can be used to request (for example) high priority delivery for traffic.
NFC	**N**ear-**F**ield **C**ommunication is a transmission standard that enables wireless data transfer.
NTP	**N**etwork **T**ime **P**rotocol is a networking protocol for clock synchronization between computer systems over packet-switched networks.
OTA	**O**ver **T**he **A**ir
PTP	**P**recision **T**ime **P**rotocol is a network protocol for synchronization of clock settings of multiple devices in a network.
RPN	**R**adio fixed **P**art **N**umber
Vox	**V**oice **O**perated e**X**change, is a switch that operates when sound over a certain threshold is detected.

10.2 Maintenance Recommendations

Following points are strongly recommended to prevent malfunction of the system.

Every six months

Charge the batteries at least every six months to avoid deep discharge, which could damage the batteries.

10.3 Service

If you have any further questions, we offer comprehensive customer service options for this product including:

- Telephone Service
- Email Service
- Fax Service
- Configuration Support
- Trainings
- Repair

Your primary point of contact for any service issues is your local dealer.
In addition, Riedel Customer Service in Wuppertal, Germany is also available to assist you.

Telephone: +49 (0) 202 292 9400
(Monday - Friday, 8am – 5pm, Central European Time)

Fax: +49 (0) 202 292 9419

Or use the contact form on our website:
www.riedel.net > Services > Support

For repairs, please contact your local dealer. Your dealer will be able to help process your repair as fast as possible and/or arrange for the delivery of spare parts.

The address for repairs sent directly to Riedel Communications GmbH is:

Riedel Communications GmbH & Co. KG
- Repairs -
Uellendahler Str. 353
D-42109 Wuppertal
Germany

Please add a completed repair form to all your repairs.
The form can be found at the Riedel website:
www.riedel.net > Services > Repairs

10.4 Notes

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