

Bolero Antenna

Quick Start Guide

A00



This device complies with Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes or modifications made to this equipment not expressly approved by Riedel may void the FCC authorization to operate this equipment.

Radiofrequency radiation exposure Information:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device is granted pursuant to the Japanese Radio Law (電波法) and the Japanese Telecommunications Business Law (電気通信事業法). This device should not be modified (otherwise the granted designation number will become invalid).



The devices conforms to the EU guidelines

- EMV (EMC) 2014/30/EU
 - NSR (LVD) 2014/35/EU
 - RTTE (RED) 2014/53/EU
- as attested by the CE mark.



FCC IDs:

- YFJANT101019

Industry Canada ICs:

- 8706A-ANT101019

Standards:

- EN 300 330 V1.8.1 / ETSI EN 300 330 V2.1.0
- EN 301 406 V2.2.1
- EN 301 489-1/-3/-6/-17, EN 55022, EN 55024
- IEC/EN 60950-1
- ARIB STD-T66
- ARIB STD-T101



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1 Preface

Thank you for choosing a Riedel product.

This PDF document provides information about the Bolero Antenna, pin outs, mechanical and electrical data.

For further information, please download the full Bolero User Manual on the Riedel Website (www.riedel.net).
You need to login to access the download area (Services > Downloads)

For further information, please contact your local distributor or the Riedel headquarters in Wuppertal.

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Bolero Antenna Quick Start Guide

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1.1 Information


Symbols

The following tables are used to indicate hazards and provide cautionary information in relation to the handling and use of the equipment.

Danger	
	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
	The highlighted line indicates the activity to prevent the danger.


Warning	
	Indicates a potentially hazardous situation which, if not avoided, could result in death or moderate injury.
	The highlighted line indicates the activity to prevent the danger.

Caution	
	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
	The highlighted line indicates the activity to prevent the danger.

	This text is for generally information. It indicates the activity for ease of work or for better understanding.
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Service


- All service has to be undertaken ONLY by qualified service personnel.
- There are no user serviceable parts inside the devices.
- Do not plug in, turn in or attempt to operate an obviously damaged device.
- Never attempt to modify the equipment components for any reason.

Caution	
	All adjustments have been done at the factory before the shipment of the devices. No maintenance is required and no user serviceable parts are inside the module.

Voltage

- The power cable should only be connected to a correctly grounded source.
- Do not use any adapters.
- Never bypass a ground contact.

Danger	
	<p>To reduce the risk of electric shock do not remove cover or expose the products to rain or moisture.</p>


Warning	
	<p>Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan.</p>
	<p>Apparatet må tilkoples jordat stikkontakt.</p>
	<p>Apparaten skall anslutas till jordat uttag.</p>

Environment

- Never place the devices in an area of high dust particles or humidity.
- Never expose the device to any liquids.
- If the devices have been exposed to a cold environment and transferred to a warm environment, condensation may form inside the housing. Wait at least 2 hours before applying any power to the devices.

Disposal

Disposal of old Electrical & Electric Equipment (Applicable throughout the European Union and other European countries with separate collection programs)

	<p>This symbol, found on your product or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. For more detailed information about the recycling of this product please contact your local city office.</p>
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1.2 About Bolero

Bolero Wireless Intercom

The Riedel Bolero Wireless Intercom system is a digital, easy to use full-duplex communications solution for broadcast, security, industrial and theater applications as well as for sports and cultural events. It is an all-new wireless intercom system capable of supporting 10 Beltpacks per antenna and up to 100 antennas in a single deployment. Bolero redefines the wireless intercom category with features such as ADR (Advanced DECT Receiver) with multiple-diversity and RF anti-reflection technology for greater RF robustness.

Bolero utilizes the benefits of the Digital Enhanced Cordless Telecommunications (DECT) standard's base layer. This provides a license-free, cellular architecture with seamless hand-over between cells, allowing each Bolero Wireless Beltpack to continuously monitor and automatically select the best connection to the Antenna.

Bolero is fully integrated in Riedel's Artist Matrix. Features like "Touch&Go" Beltpack registration, versatile operation as a wireless Beltpack, a wireless keypanel, and – in an industry first – a walkie-talkie pushing it beyond the limits of existing wireless intercom solutions.

Bolero runs over a standards-based AES67 IP network with decentralized antennas connected to AES67 switches and to Artist frames equipped with AES67 client cards, providing a fully integrated point-to-point roaming intercom ecosystem. The more decentralized antennas added, the more robust the network becomes. The Bolero high-clarity voice codec provides both higher speech intelligibility and more efficient use of RF spectrum supporting a higher number of Beltpacks per antenna in the same audio bandwidth.

The Riedel-exclusive ADR technology, combines a unique receiver design with multiple diversity elements specifically designed to reduce sensitivity to multipath RF reflections, making Bolero useable in challenging RF environments where other systems have great difficulty.

The Beltpack features 6 buttons for 6 intercom channels or point to point communications, plus a separate "Reply" button that easily facilitates a reply to the last person that called. Bolero's sunlight readable and dimmable display can be inverted so that it is readable in any orientation. The Beltpack can be used without a headset like a walkie-talkie radio utilizing an integrated mic and speaker. Bolero Beltpacks support Bluetooth 4.1, allowing a Smartphone to be connected.

The Beltpack design with a combination of premium materials, including high-impact plastics and rubber overmolds make it both tough and comfortable to use in any situation.

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.

What is Bolero?

- A next generation high performance digital wireless intercom system
- License-free, cellular architecture with seamless hand-over
- Riedel exclusive advanced next generation DECT receiver with multiple-diversity and RF anti-reflection technology for greater RF robustness
- Efficient use of RF spectrum for a hasselfree operation even with high channel count

Riedel Bolero – Key Features

- 10 Beltpacks per Antenna
- 100 Antennas per system
- 100 Beltpack capacity per system
- Cellular architecture with seamless hand-over
- Standards-based, decentralized, AES67 IP-networked Antennas
- Fully integrated with Artist for point-to-point comms
- License free
- No registration headaches! Touch the Beltpack to the antenna and GO!
- Riedel-exclusive ADR receiver technology
- Up to six full-duplex keys plus convenient REPLY button
- Modern, high-clarity voice codec
- Integrated mic and speaker for headset-free operation
- Can be used as a Beltpack, a portable desktop keypanel, or Walkie-Talkie
- Tough & ergonomic – Beltpack built to survive
- Bluetooth 4.1
- Weatherproof
- Bottle opener – just in case!

2 Bolero Antenna

Bolero active Antennas runs over a standards-based AES67 IP network. Up to 100 antennas and 100 Beltpacks are able to connect to a system. The intelligent and high efficient use of bandwidth results in 10 Beltpacks per Antenna. The decentralized Antennas allowing the use of existing standard structured cabling and providing a wide area between the Antennas connected to AES67 switches and the Artist frames equipped with AES67 client cards. This is providing 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.

2.1 Operating Elements

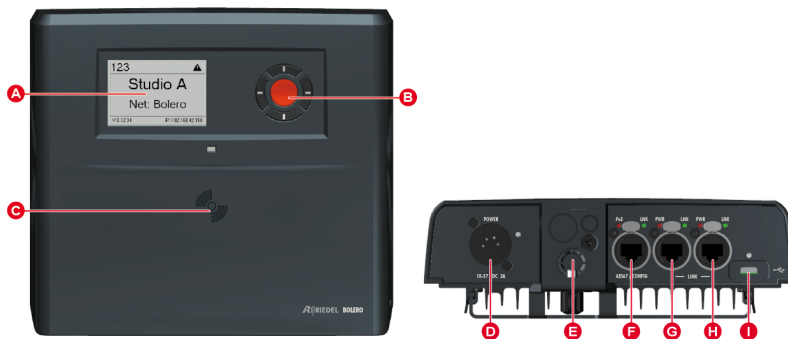


Figure 1: Antenna (front, bottom)

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

XLR-4 (male)

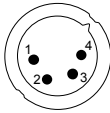


Figure 2: XLR-4 male

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

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

RJ45



Figure 3: 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-

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

USB Type-C

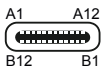


Figure 4: USB Type-C

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

The USB connector is used for the firmware update.

2.2 Status LEDs



Figure 5: Antenna (Status LED position front)

Status-LED **1**

off		not powered
green	on	Antenna ready (System ok)
red	blinking	Antenna power error
orange	on	Antenna powered up (Radio OFF)
	blinking	booting

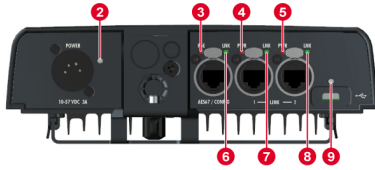


Figure 6: Antenna (Status LED positions bottom)

Power-LED 2

off	no XLR input power	
green	on	XLR input power ok

AES67-PoE-LED 3

off	no PoE+ input power	
green	on	PoE+ input power ok
red	on	PoE+ input power out of range

LINK-PWR-LEDs 4 5

off	no LINK input power	
green	on	LINK input power ok
red	on	LINK input power out of range

AES67-LNK-LED 6

off	no AES67 connection present	
green	on	AES67 connection ok
red	on	AES67 connection failure

LINK-LNK-LEDs 7 8

off	no LINK connection present	
green	on	LINK connection ok
red	on	LINK connection failure

USB-LED 9

off	no USB input power	
green	on	USB input power ok
red	on	USB input power out of range

2.3 Getting Started

2.3.1 Bolero-Artist Setup

This chapter describes the required steps to integrate a Bolero-System with an Artist-System. The following devices are required:

- ✓ Artist frame with AES67 client card
- ✓ Bolero Antenna
- ✓ Bolero Beltpack
- ✓ Network Switch (optionally with PoE+ functionality)

- Connect the 'AES67-1' port of the AES67 client card in the Artist frame to the network switch.
- Power up the Artist frame.

- 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.

After booting the display shows in the bottom right the IP address of the Antenna (i.e. 192.168.42.150).

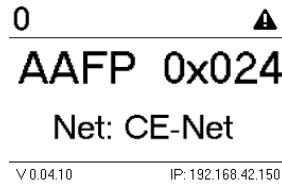


Figure 7: Antenna Display

- Execute the Artist configuration software **Director** on the PC.

Verify that the IP address of the AES67 card in the Artist frame is within the subnet of the Bolero Antenna:

- Open the AES67 properties by right clicking on the respective card and choosing "Properties".

- If necessary, edit the IP address and transfer the changes to the Artist frame.

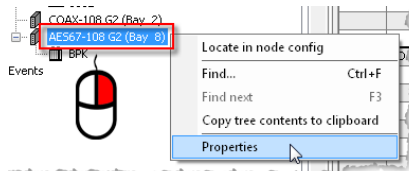


Figure 8: Open the AES67 card properties

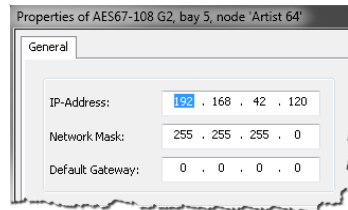


Figure 9: Properties of the AES67 card

Open the web interface of the Antenna:

- Enter the IP address in the Web-Browser (i.e. 192.168.42.150).

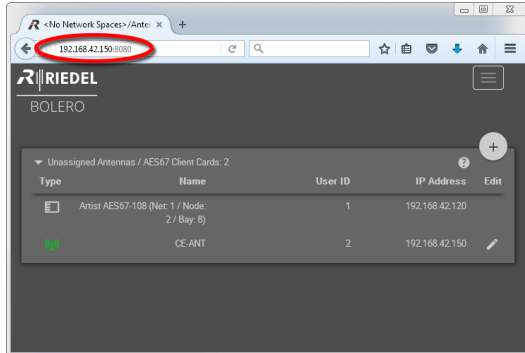


Figure 10: Web interface of the Antenna

- Select the Antenna(s) and AES67 card by left clicking.

Selected elements will be highlighted.

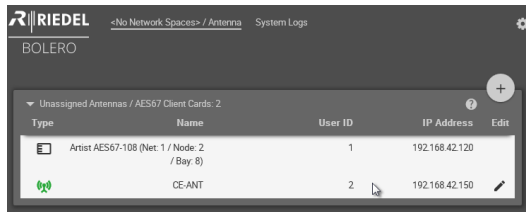


Figure 11: Selected Antennas and AES67 cards

- Click on the plus symbol and select the entry **Create Network Space**.

A dialog is opened to enter the Net name and the admin password.

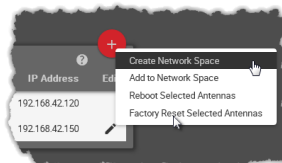


Figure 12: Create Network Space

- Enter a name for the Bolero net in the field **Name** (i.e. CE-Net).
- Define an **Admin PIN** (4 digits, 0–9).
- **Apply** the entries.

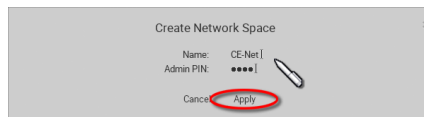


Figure 13: Dialog – Create Network Space

This example shows the new created Network Space called **CE-Net**. In this example, the net consists of one Antenna and one AES67 card.

Type	Name	User ID	IP Address	Temp	GD BP	Edit
	Arist AES67-108 (Net: 1 / Node: 2 / Bay: 8)	1	192.168.42.120	39°C		
	CE-ANT	2	192.168.42.150	59°C		

Figure 14: Assigned Antenna and AES67 card

- Log into the CE-Net by clicking on the lock symbol.

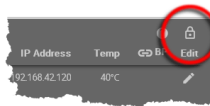


Figure 15: Login

- Enter the Admin PIN.

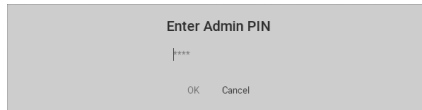


Figure 16: Dialog - Password

- Click on the plus symbol and select the entry **Registration Mode**.

A dialog is opened to enter the registration options.

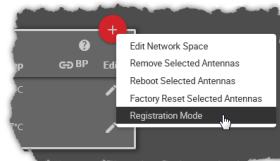


Figure 17: Registration Mode

- Enable the function OTA and/or NFC.
- Apply the changes.

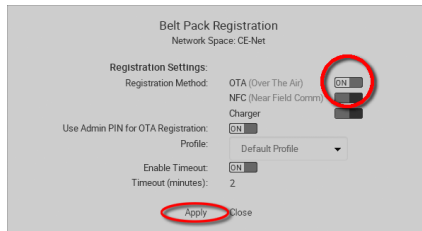


Figure 18: Dialog - Beltpack Registration

Beltpacks are able to register to this net as long as the registration mode is active.

For detail information see chapter **Beltpack > Net Registration** in the Bolero User Manual.

Registration Active (OTA)

Figure 19: Beltpack Registration active

Registered Beltpacks are listed on the page **Registered Beltpacks**.

- Click on the Beltpacks ID and enter an unused Beltpack ID (0-999).

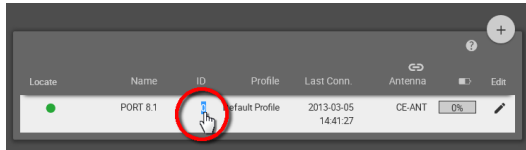


Figure 20: Registered Beltpacks

Go now to the Artist configuration software Director:

- Open the Beltpack properties by right clicking on the respective Beltpack and choosing "Properties".

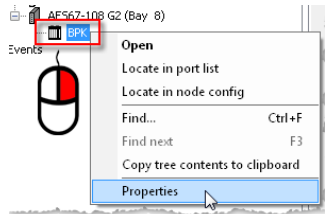


Figure 21: Open the Beltpack properties

- Select the 'Bolero' tab.
- Enter the same Bolero User ID that you entered in the Antenna's web interface.
- If necessary, edit the Multicast address. A unique Multicast address must be used for each Beltpack in the Director config.

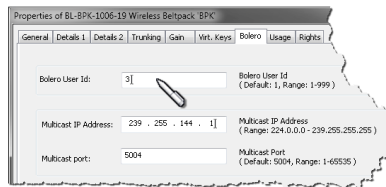


Figure 22: Properties of the Beltpack

The Beltpack's key functions can be defined now via the Director. The Beltpack is now able to talk to the Artist system and vice versa.

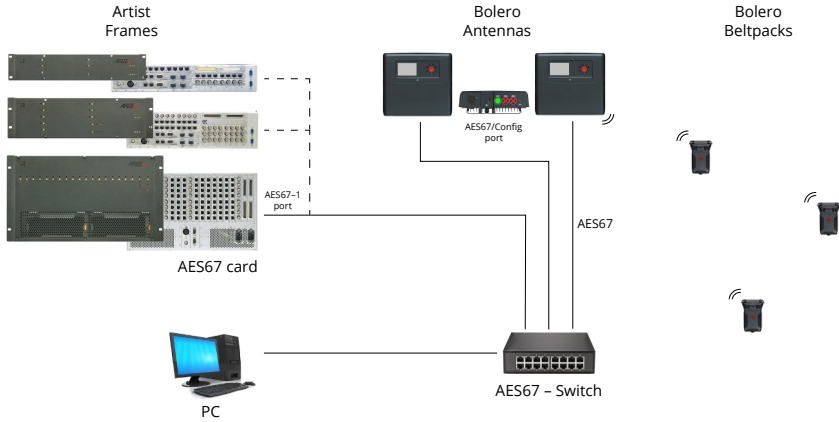



Figure 23: Bolero-Artist - Setup Diagram

- | | |
|--|---|
| | <p>A 1Gbit Ethernet connection is necessary to operate the Bolero net.
 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).</p> |
| | <p>More information about Beltpack, Antenna and Charger can be found in the Bolero User Manual.</p> |

2.3.2 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.
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The Bolero System needs the following key technologies supported by the switch fabric:

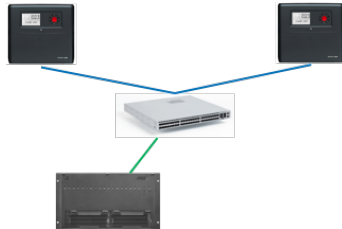
PoE+ (IEEE 802.3at)

Required to power the device without external PSU.

- 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.

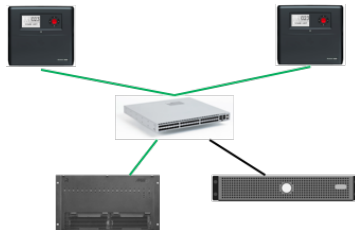


IGMP snooping (v2)

Required on every switch.

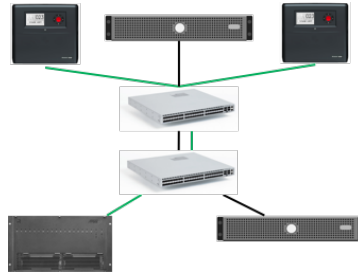
- Multicast traffic only reaches ports that explicitly ask for it
- Also prevents Artist CPU card from being flooded with Bolero traffic

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.



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

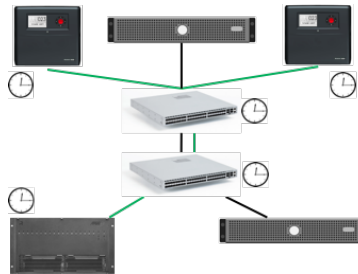
- Traffic from the Bolero Antennas can be prioritized when transmitted through a larger network.
- Extremely important when the network contains more than one switch.
- Prioritization on:
 - a. PTP [E, F]
 - b. AES67 [AFU1]



PTPv2 (IEEE 1588) boundary clock or transparent clock

Required to build networks with more than three switches and other traffic.

- 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



Network Size	Classifications	Requirements
Small	<ul style="list-style-type: none"> • Up to 20 Beltpacks and 5 Antennas • Only Riedel audio traffic • Central switch or stacked switches 	<ul style="list-style-type: none"> • IGMP snooping • QoS
Medium	<ul style="list-style-type: none"> • Up to 50 Beltpacks and 20 Antennas • Only Riedel audio traffic • Up to three switch hops 	<ul style="list-style-type: none"> • IGMP snooping • QoS
Large	<ul style="list-style-type: none"> • Up to 100 Beltpacks and 100 Antennas • Mixed traffic • More than three hops 	<ul style="list-style-type: none"> • IGMP snooping • QoS • PTP boundary clock or PTP transparent clock

2.4 Technical Specifications

Antenna Product Code	BL-ANT-1010-19	
No of Beltpacks per Antenna	10	
RF Frequency Range	1.880 ... 1.930GHz (region dependent, not changeable by the user)	
RF	Antenna Coverage	Indoor (structure dependent): ~200 ... 400m Outdoor (free line of sight): ~300 ... 500m
	Beltpack to Antenna range	Indoor (structure dependent): ~100 ... 200m Outdoor (free line of sight): ~150 ... 250m
Programmable RF Transmission power	Yes	
Beltpack Registration	1 touch NFC & over the air	
Network Connection	AES67 IP	
USB Type-C	USB 2.0 connector	
Display Type	High contrast E-ink display	
Power Supply	PoE+ (802.3at, type 2, class 4, 15-30 W) or 8 ... 57 VDC	
Power Consumption	15 W	
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	IP54 sealing; dust protected + splashing of water	
Operating Environment	Temperature	-10° ... +55°C
	Humidity	0 % ... 90 % rel. (non-condensing), Ta=40°C

3 Appendix

3.1 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 > [Company](#) > [Contact](#) > [Wuppertal \(Headquarters\)](#)

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](#)

3.2 Notes

Notes

