



RTS NOMAD Wireless Intercom System

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1 Important Information

1.1 Copyright and Disclaimer

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All other trademarks are property of their respective owners.

The content and illustrations are subject to change without prior notice.

1.2 Notices

	CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN	
The lightning flash and arrowhead within the triangle is a warning sign alerting you of dangerous voltage inside the product.	Caution: To reduce the risk of electric shock, do not remove the cover. No user-serviceable parts inside. Refer servicing to qualified service personnel.	The exclamation point within the triangle is a warning sign alerting you of important instructions accompanying the product.
See marking on bottom/back of product.		



Warning!

Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.



Warning!

The main power plug must remain readily operable.



Caution!

To reduce the risk of electric shock, grounding of the center pin of this plug must be maintained.

**Warning!**

To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

**Warning!**

To prevent injury, this apparatus must be securely attached to the floor/wall/rack in accordance with the installation instructions.



This product is AC and DC.



CE Compliant and UKCA Certified

**Warning!**

This is a CLASS A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

1.3

Important safety instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug the apparatus during lightning storms or when unused for long periods of time.

14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Do not disassemble or subject batteries to impact.
16. Do not operate or charge a battery that has been damaged.
17. Never heat the Li-Ion batteries or throw them into a fire.
18. Charging the Li-Ion batteries in temperatures below freezing can cause permanent damage.
19. Store the batteries in a cool, dry ventilated area.
20. Dispose of Li-Ion batteries properly.
21. Before flying with the ROAMEO system, consult the airline regulations concerning the Lithium batteries.
22. Use only the manufacturer's supplied charger to charge the batteries.

1.4

FCC Information & Industry Canada

These devices are accepted under United States Federal Communications Commission Part 15. This device complies with Part 15 of the FCC. Operation is subject to the following two conditions:

- This device may not cause interference
- This device must accept any interference, including interference that may cause undesired operation of the device

Notice!

Changes or modifications made by the user could void the user's authority to operate the equipment.

The backpack is intended to be worn on the belt of the user or connected via lanyards hanging down over the chest. Placing the backpack in any other location on the body may reduce performance and void the user's authority by the FCC to operate the equipment.



Business Equipment for commercial or professional use

This equipment has been tested and found to comply with the limits for a Class A device, pursuant to Part 15 Subpart B of the FCC, Canadian ICES-003 and CE requirements. 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 and energy. If not installed and used in accordance with the instruction manual, this may cause harmful interference to radio communications. Operation of this equipment in residential areas is likely to cause harmful interference, in which case the user will be required to correct the interference at their own expense. Intentional or unintentional changes or modifications not expressly approved by the party responsible for compliance shall not be made. Any such changes or modifications may void the user's authority to operate the equipment. If necessary, the user should consult the dealer or an experienced radio/television technician for corrective action.

Mandatory Safety Instructions to Access Point Installers and Users

1. The antenna minimum safe distance, for an access point, as set by the FCC is 20 cm. Antenna gain: 1 dBi. The antenna are within the upper housing of the access point.

2. The FCC (Federal Communications Commission) has adopted a safety standard for human exposure to RF (Radio Frequency) energy, which is below the OSHA (Occupational Safety and Health Administration) limits.
3. To comply with current FCC RF Exposure limits, the access point must be installed at or exceeding the minimum safe distance show here, and in accordance with the requirements of the antenna manufacturer or supplier.
4. Antenna substitution: Do NOT substitute any antenna for the ones installed within the access point by the manufacturer or radio dealer. Substituting an antenna may expose a person or persons to harmful radio frequency radiation. Contact the radio dealer or the manufacturer for further instructions.

**Warning!**

Maintain a separation distance from the access point to person(s) of at least 20 cm.
Maintain a separation distance from the beltpack front face to person(s) of at least 3.5 cm. When beltpack worn as stated in this section this distance is maintained.

5. As the qualified end user of this radio device, control the exposure conditions of bystanders to ensure that the minimum separation distance (above) is maintained between the access point and nearby persons to satisfy RF exposure compliance.

These devices are certified to Industry Canada RSS-213 and ICES-003.

This device complies with Industry Canada license exempt RSS standard(s). Operation is subject to the following two conditions:

- This device may not cause interference, and
- This device must accept any interference, including interference that may cause undesired operation of the device.

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:

- l'appareil ne doit pas produire de brouillage, et
- l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Industry Canada Compliance Statement. This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

1.5

Europe

This equipment is in compliance with the following directives;

- 2011/65/EU with 2015/863 Amendment
- 2012/19/EU WEEE Directive
- 2014/53/EU RED Directive

Please dispose of the access point and beltpacks at the end of its operational life by taking it to the closest collection point or recycling center.

This equipment is intended for use in professional audio intercom applications.

Equipment intended for sale in (ISO 3166-1, 2 letter country code): AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MT, NL, NO, PL, PT, RO, SE, SI, SK.

A license may be required to operate this equipment in certain regions. Consult the national authority for possible requirements.

The full EC Declaration of Conformity for the TR-1000 and AP-1000 may be found at the following website: www.rtsintercoms.com.

This equipment is in compliance with:

- The Radio Equipment Regulations 2017
- The Electromagnetic Compatibility Regulations 2016
- The Electrical Equipment (Safety) Regulations 2016
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

The full UK Declaration of Conformity for the TR-1000 and AP-1000 may be found at the following website: www.rtsintercoms.com.

1.6 Additional certification information

2 Introduction

The RTS Nomad Wireless Intercom System is an integrated digital wireless communications system consisting of belt packs (TR-1000) and access points (AP-1000) communicating over DECT (Digital Enhanced Cordless Telecommunications). OMNEO technology, a Dante-based platform for premium IP audio transmission, is used as the communication between access points and the switching matrix. The globally recognized DECT standard operates without licensing requirements in over 80 countries. You can create large continuous radio coverage areas by strategically placing access points throughout the coverage area. Belt pack users can roam freely within the coverage area without worry of losing communication. RTS Nomad uses standard IP infrastructure as a backbone. RTS recommends the exclusive use of managed switches through the IP network. You can easily address and configure the belt pack using the same configuration software as RTS wired keypanels.

2.1 AP-1000 overview

2.1.1 Controls & connections

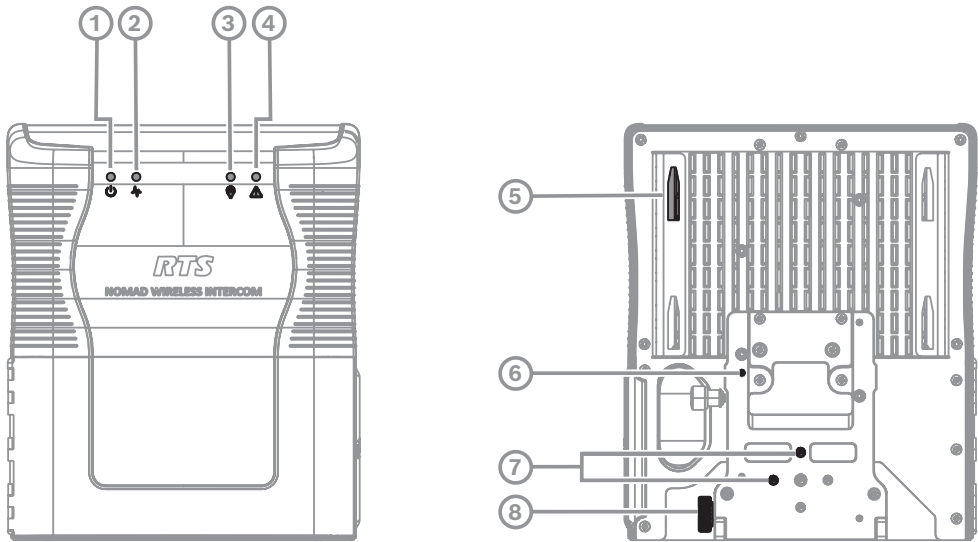


Figure 2.1: AP-1000 reference view

1	Power LED
2	Online/Matrix connectivity LED
3	Location LED
4	Fault/Status LED
5	Anton Bauer universal V-mount battery bracket hole
6	Door grab handle
7	Vertical or horizontal Manfrotto super clamp mounting holes

8	Spigot adapter (hex) mount lock thumb screw
9	North American camera mount (1/4-20)

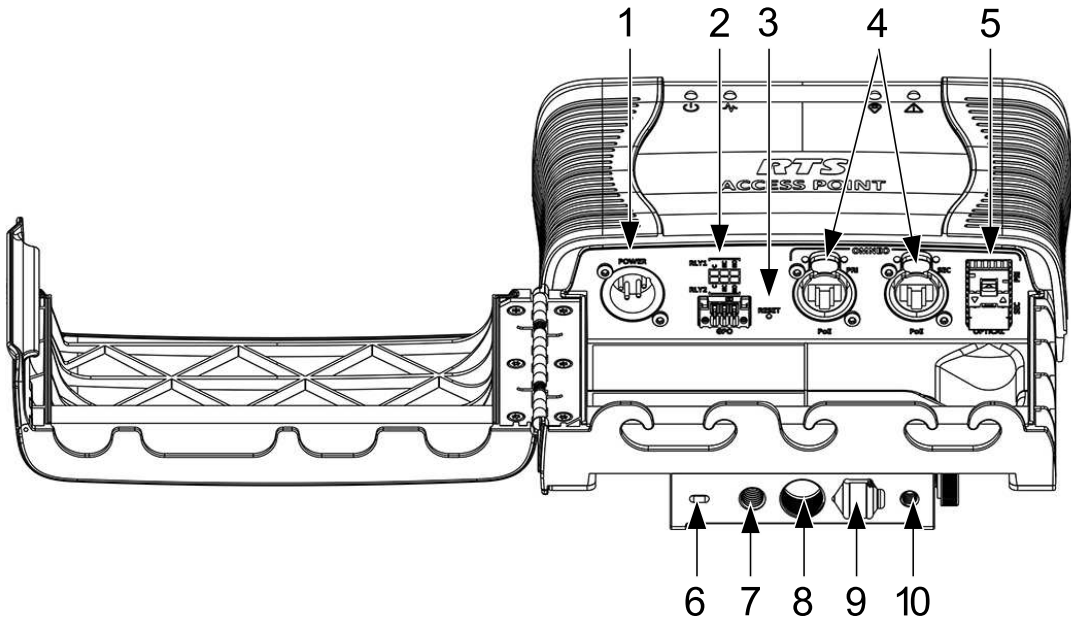


Figure 2.2: AP-1000 open reference view

1	4-pin XLR for power supply or battery
2	2 x GPO relay ports
3	Paper clip reset hole
4	PRI & SEC OMNEO connections with CNTL. PoE Pd capability
5	PRI & SEC dual fiber OMNEO connections with CNTL
6	Slot that accepts both types of Kensington lock
7	European camera or mic stand mount
8	Microphone stand mount (5/8-27)
9	Spigot adapter (hex) mount
10	North American camera mount (1/4-20)

2.1.2 Antenna information

The AP-1000 has two different antennas in it.

- For DECT it uses two sleeve dipoles for antenna diversity on either side of the upper portion of the unit.
- For Bluetooth Low Energy (BLE) it uses one 1/4-wave monopole in the upper center of the unit.

2.1.3 Power

The AP-1000 accepts three power sources:

- In-line power supply (not supplied)

- Anton Bauer battery (not supplied)
- Power over Ethernet (PoE)

2.1.3.1

Open and close cable door

To cable AP-1000 you must access the connectors which are housed within the unit. The door features a spring mechanism that holds it open. This design allows the door to remain securely open while you connect the cables to the unit, providing easy access and facilitating a smooth cabling process.

1. Grasp the door latch on the side of the unit and pull it outward. You will feel the latch detach from the unit.
2. Lift the door upward to open the unit.

2.1.3.2

4-Pin XLR connector

Connect power to the AP-1000 through the XLR connector using one of two methods:

- **In-line power supply** - The access point can use an inline power supply that has a 12V, 3.0 Amp power supply.
- **Anton Bauer battery** - The access point can use a 14.2V Anton Bauer battery (such as the Titon 90V Battery) for power.

Pin	Description
1	Ground
2	Digital ground
3	Not connected
4	Power input (battery or power supply)

Table 2.1: 4-pin connector pinout table

2.1.3.2.1

Using an inline power supply

2.1.3.2.2

Using an Anton Bauer battery

You can use an optional Anton Bauer battery to power the AP-1000 when a nearby power supply is unavailable. To use the battery, first install a battery plate that allows the battery to lock securely into place.

Attach the V-Mount battery plate

Notice!

You must use the Vocus V-Mount Battery Plate with 4-Pin XLR Output (P/N 0370-0170)

1. Align the holes on the battery plate to the holes on the back of the unit.
 - If you are using the battery with the mounting bracket, then align the holes on the battery plate with the holes on the mounting bracket.

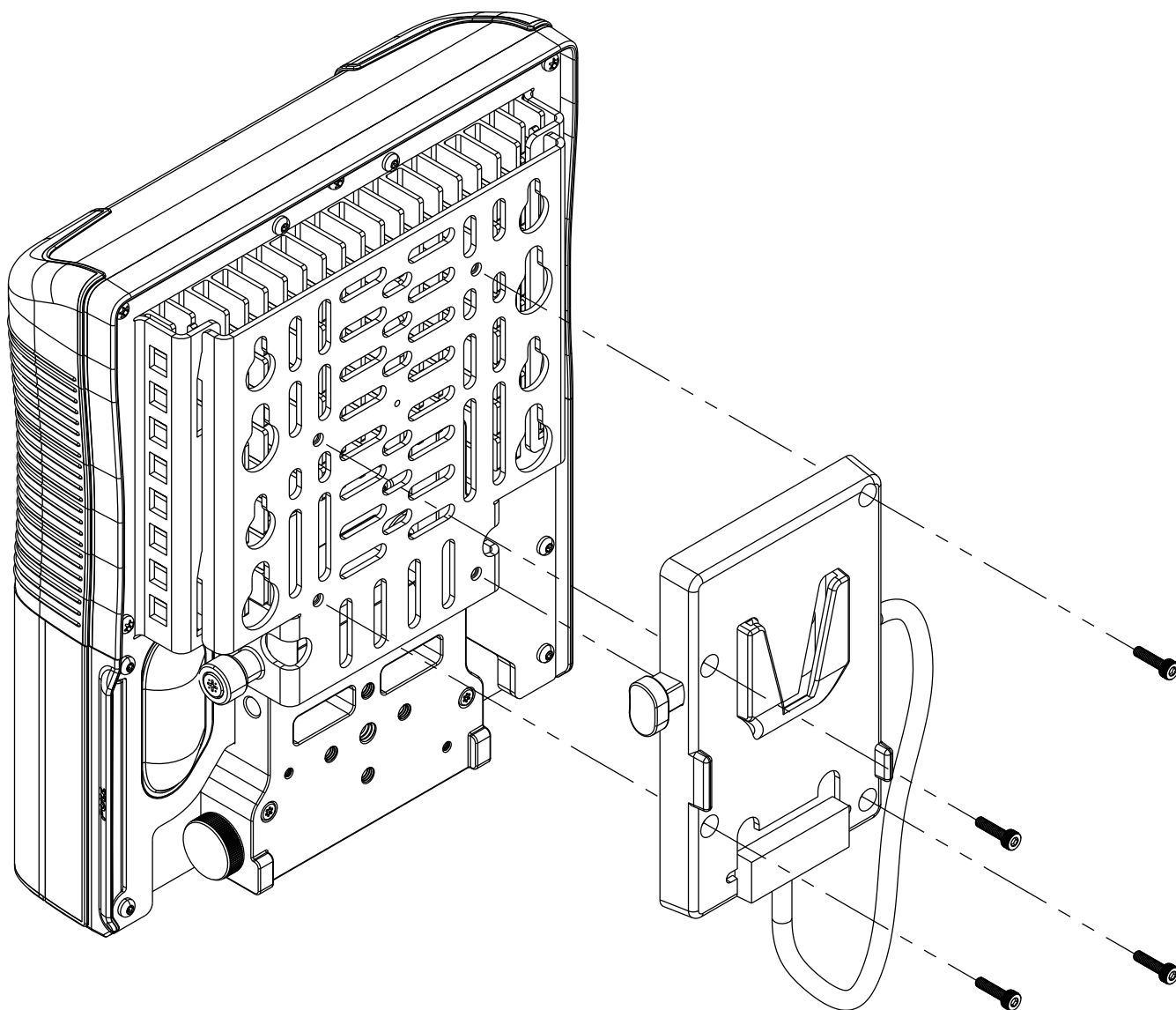


Figure 2.3: Battery plate with mounting bracket

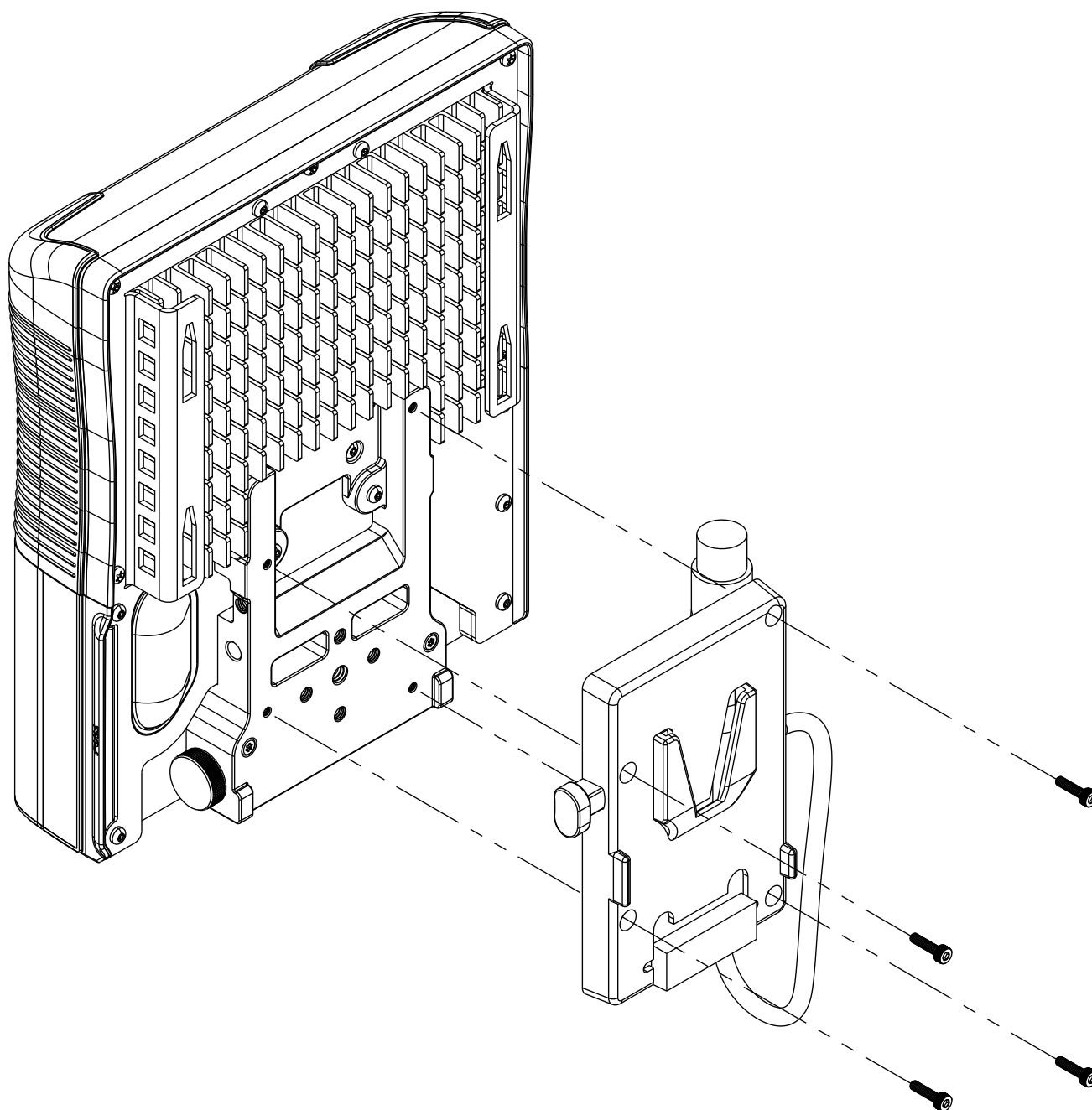


Figure 2.4: Battery plate without mounting bracket

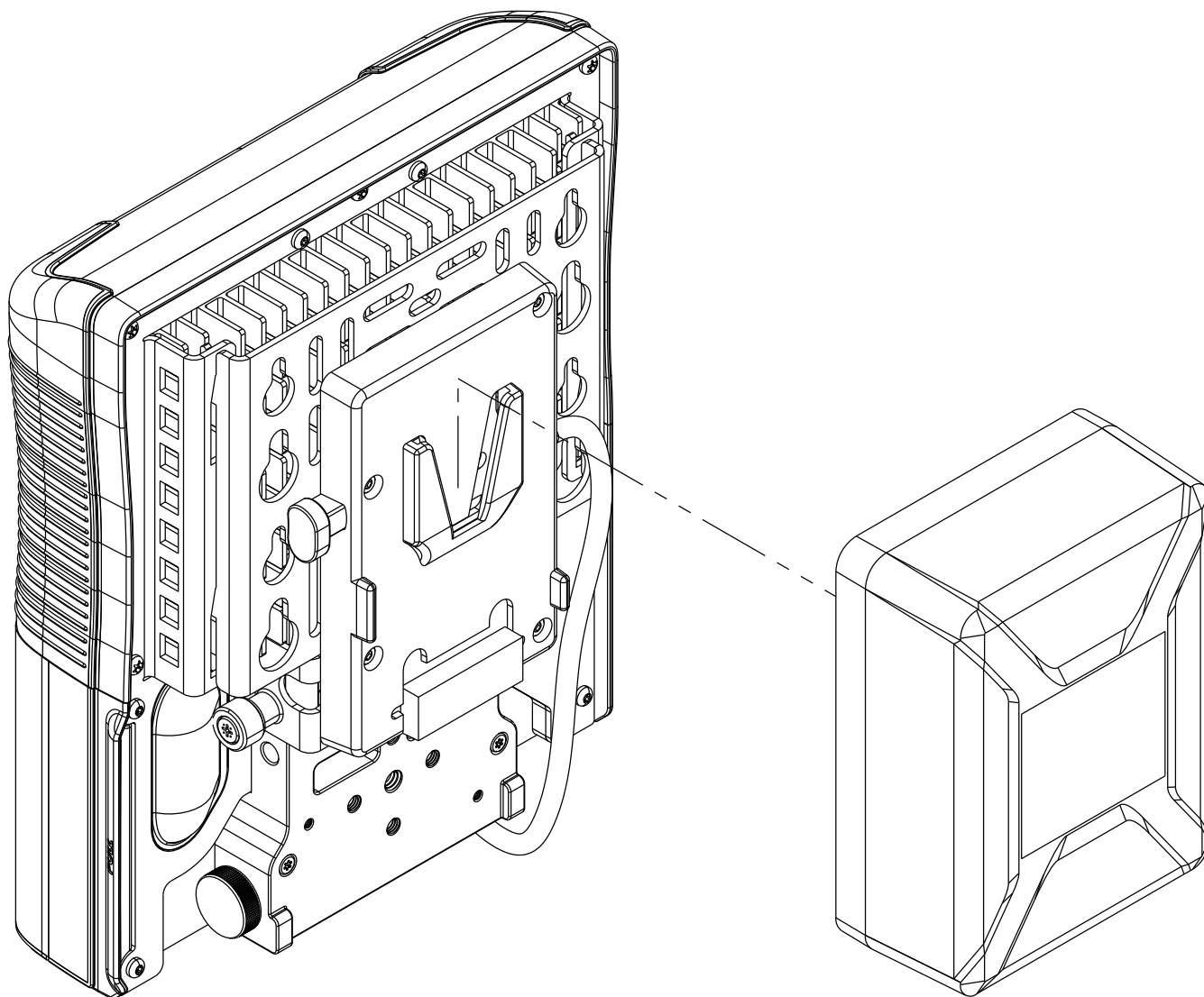
2. Secure the plate to the unit with the supplied screws.

Attach the Anton Bauer battery

Notice!

You can use the Anton/Bauer Titon 90 V-Mount Lithium-Ion Battery (P/N 8675-0132) or any other capacity V-Mount 14 VDC Lithium-Ion Battery.

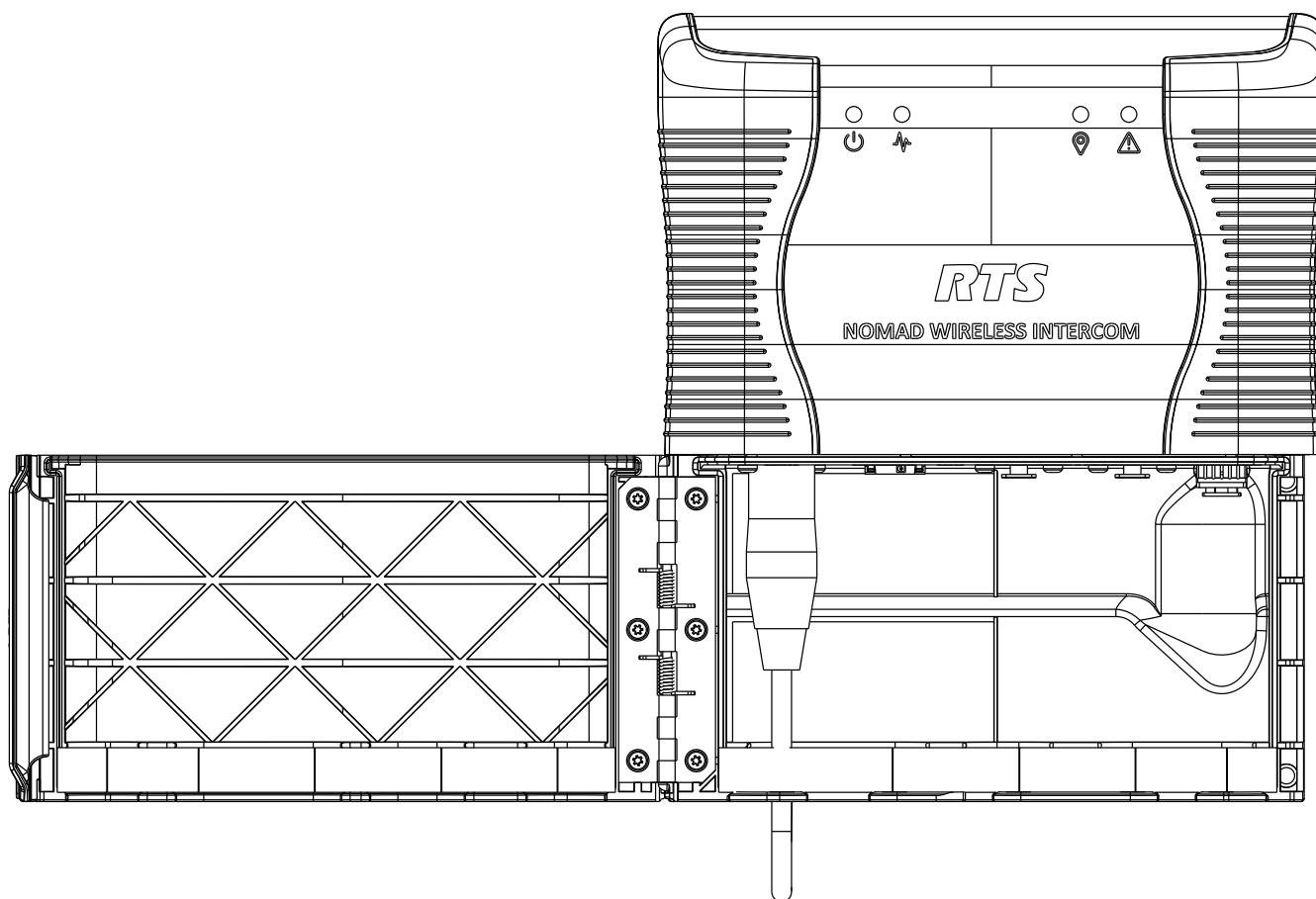
1. Position the Anton Bauer battery so that the V-Mount connector aligns with the battery plate.
2. Slide the battery onto the V-Mount battery plate, ensuring that the connectors engage properly.



3. Push the battery down until you hear a distinct click, which confirms that the battery is securely in place.

Connect the battery to the AP-1000

1. Open the cable door on the unit.
2. Locate the proper Power connector.



3. Connect the 4-pin XLR connector to the unit.
 - Take care to push the cable into the cord seal and to thread it through the cable hook ensuring that it does not move around.
4. Close the cable door.

2.1.3.3

PoE+ / PoE++

You can power the AP-1000 with PoE from an Ethernet switch or injector via either of its two RJ-45 Ethercon connectors.

The AP-1000 accepts either PoE+ (802.3at) or PoE++ (802.3bt).

2.1.3.3.1

Connect PoE+/PoE++ power

2.1.4

Route cables

After you securely mount the access point, proceed to connect the necessary cables to set up the system for operation. Ensure that you follow the appropriate wiring guidelines to establish a reliable connection, allowing the access point to function effectively within your network.

1. Open the door of the AP-1000.
2. Connect the cable to the designated connector.
3. Carefully thread the cable through the cable hook, ensuring that you push the cable into the cord seal (sponge bed).

2.2 TR-1000 overview

2.2.1 Controls and connections

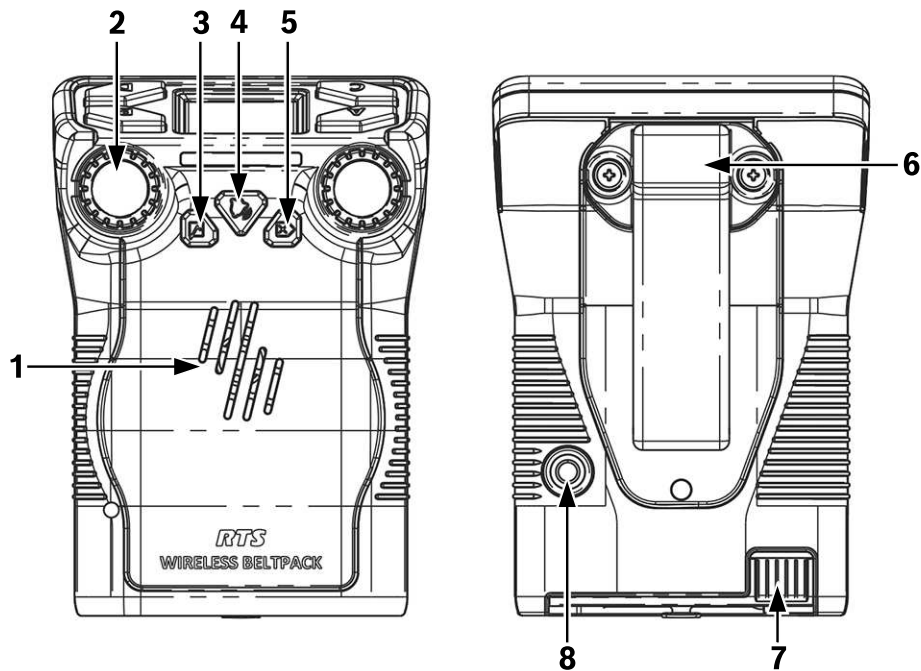


Figure 2.5: TR-1000 front and back views

	Description
1	Speaker
2	Volume knobs
3	Select
4	Menu
5	Cancel
6	Belt clip - field replaceable
7	Battery contacts for charging
8	Magic arm mount - ¼-20 threaded insert

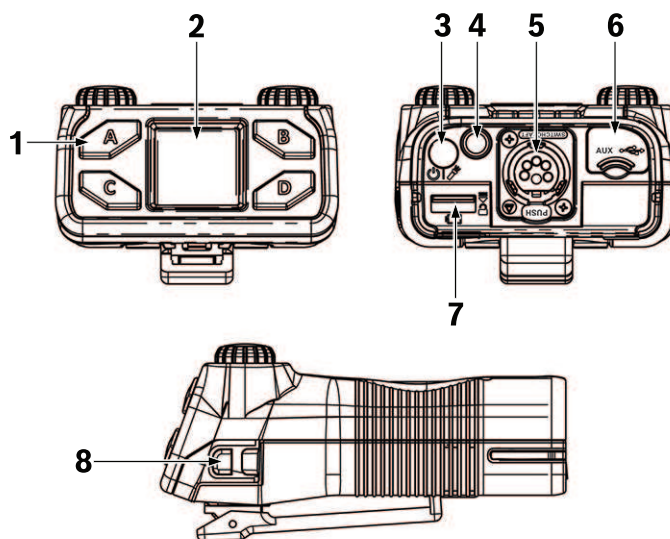


Figure 2.6: ABP-1000 Top, bottom, and side views

	Description
1	Talk keys - backlit
2	Color display
3	Power/flashlight button
4	Flashlight - red and white backlit
5	XLR connector - field replaceable 4-pin and 5pin
6	Rubber plug for IP-65 over 3.5 mm Jack and USB-C
7	Battery release
8	Lanyard loops

2.2.2

Power

Two ways to power the TR-1000 :

1. Battery pack
2. User supplied USB-C type adapter plugged into the unit with or without the battery attached.

2.2.2.1

Battery charger overview

2.2.2.2

Charge battery

2.2.3

Frequencies of operation

- For Europe: 1880-1900 MHz
- For North America: 1920-1930 MHz

ETSI Defined RF Channels for DECT

DECT systems automatically select the best interference-free frequencies on which to operate. The user does not need to do any frequency coordination. The ETSI (European Telecommunications Standards Institute) Channel Plan shows the European and North American RF carrier pools the DECT systems use.

There are 10 frequencies in Europe and five frequencies in North America.

RF Carrier Number	Carrier Frequency, MHz	Where Used
0	1897.344*	Europe, Singapore, Austrailia
1	1895.616*	Europe, Singapore, Austrailia
2	1893.888*	Europe, Singapore, Austrailia
3	1892.160*	Europe, Singapore, Austrailia
4	1890.432*	Europe, Singapore, Austrailia
5	1888.704*	Europe, Singapore, Austrailia
6	1886.976*	Europe, Singapore, Austrailia
7	1885.248*	Europe, Singapore, Austrailia
8	1883.520*	Europe, Singapore, Austrailia
9	1881.972*	Europe, Singapore, Austrailia
23	1921.536	US, Canada, Mexico
24	1923.264	US, Canada, Mexico
25	1924.992	US, Canada, Mexico
26	1926.720	US, Canada, Mexico
27	1928.448	US, Canada, Mexico

Table 2.2: ETSI defined RT Channels for DECT

* Most common carriers used in the world.

Bluetooth Low Energy (BLE) band	2400 MHz to 2483.5 MHz
---------------------------------	------------------------

2.2.4

Bluetooth

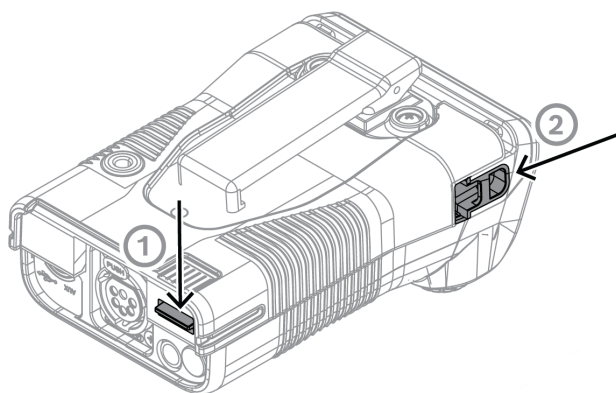
Bluetooth Low Energy (BLE) is a power-conserving variant of Bluetooth. The beltpack uses BLE so the unit can connect to Bluetooth headsets, smartphones or other BLE devices. The beltpack is compatible with BLE version 5.3 or above.

2.2.5

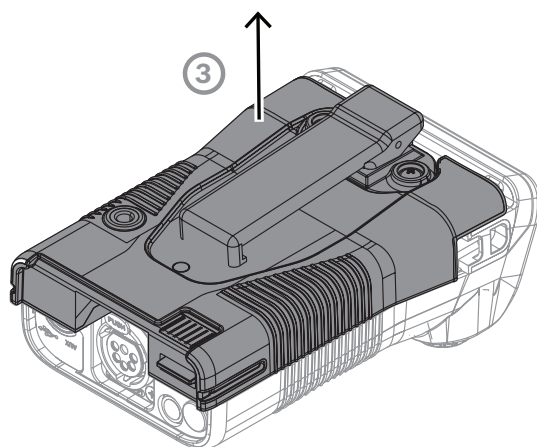
Battery removal and replacement

Remove the battery:

1. Lift the battery release button (1) up and simultaneously push the beltclip toward the bottom of the device to disengage the battery.
 - Apply a small amount of extra force if needed to remove the battery.
 - Note that the battery will only slide a short distance before stopping.

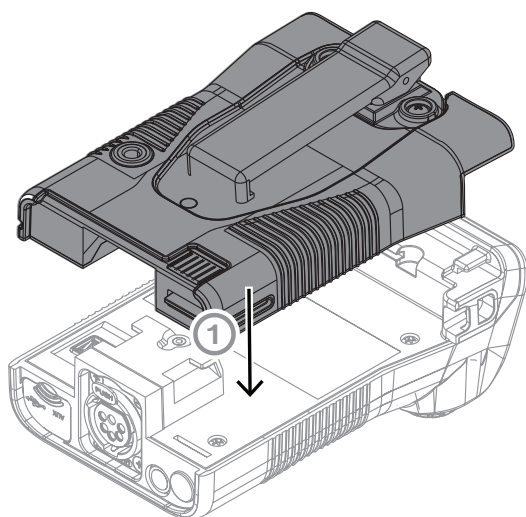


2. Remove the battery by lifting it up and away from the device.

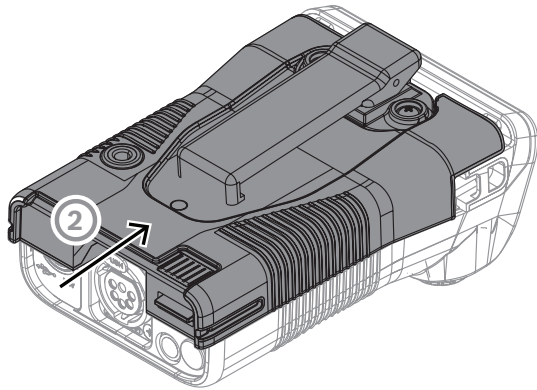


Replace the battery

1. Align the battery with the proper grooves on the device.



2. Slide the battery toward the top of the device until you hear it click into place.



2.2.6 Lanyard installation

2.2.7 Belt clip installation and removal

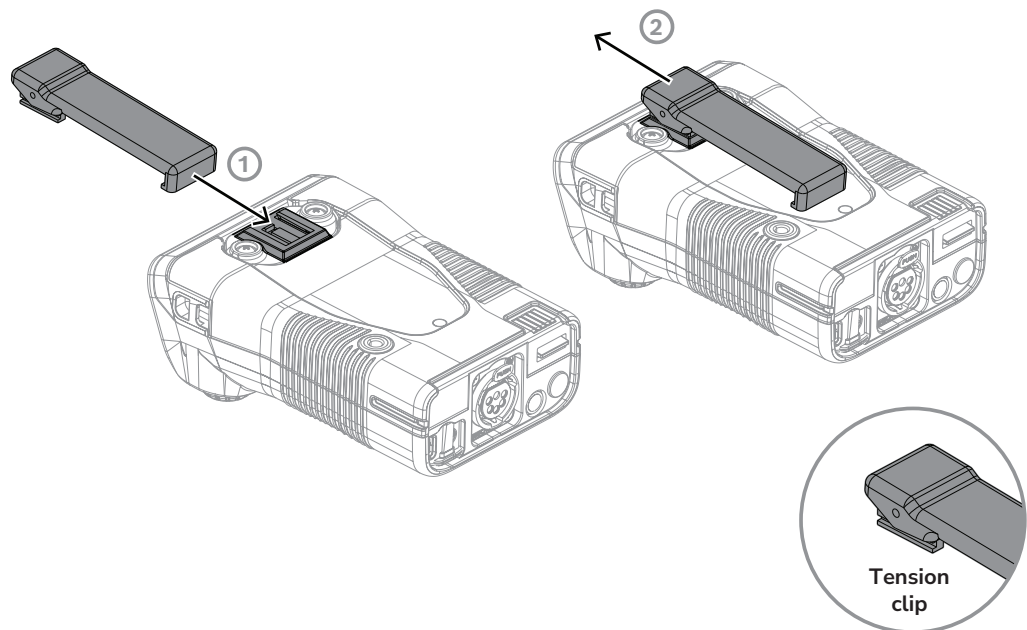
To **install or remove the belt clip**, do the following:

- ▶ On the back panel of the beltpack, align and slide the **belt clip into the belt clip track** to install the belt clip (1).

A click is felt/heard when the belt clip is securely in place.

OR

On the back panel of the beltpack, while lifting up on the tension clip, carefully **slide the belt clip out of the belt clip track** (2).



3 System overview

3.1 System description and system drawings

An RTS Nomad Wireless Intercom System consists of two types of devices: a wireless beltpack (TR-1000) and an access point (AP-1000).

The Nomad system can be configured for anything from small systems, one access point and a few beltpacks, to a large system, hundreds of access points and hundreds of beltpacks. The Nomad system provides quality, configurable wireless audio across the coverage area and is easily expandable.

The typical indoor coverage area varies widely depending on the installation area. The typical range of an access point is between 50-100 meters.

System Considerations

- The number of access points required for the coverage area.
- Sufficient access point coverage overlap to allow seamless roaming for beltpacks.
- The number of access points to provide sufficient capacity for all beltpacks planned to be in the area. It is especially important to consider how many beltpacks are booted in the same area and then moved to other areas. The initial beltpack staging area should be able to provide access to all devices.
- Area Considerations:
 - Metal Barriers - Signal reflects off metal, which can provide good signal fill for areas. However, the signal will not pass through metal.
 - Cement - Signal usually passes through with little problem. Dependent on the cement thickness and the presence of any metal rebar.
 - Wood and Drywall - No issues.
 - Overall Size - May need more access points to cover a large area even if only a few beltpacks are used.
 - Spectrum Bandwidth - Other DECT systems in the area (i.e., wireless phone systems that use some of the DECT spectrum allow less beltpacks in the area).
- The intercom system supports enough OMNEO channels for the number of beltpacks needed.
- The Ethernet infrastructure supports access points with sufficient bandwidth for additional traffic and uses managed OSI Layer 3-capable switches.

3.1.1 System checklist

- Each beltpack has only one HOME access point.
- When subscribing a beltpack to the system, the beltpack must be within 40 feet (12 meters) of an access point in that system.
- Each access point can be host for up to 10 beltpacks with no channels left for roaming beltpacks.
- Only load each access point up to eight beltpacks to allow for roaming beltpacks.
- Always have Ethernet connected to an access point before powering up the access point.
- The Ethernet network follows standard Ethernet practices.
- Use only CAT5e UTP or better Ethernet cables.
- Use only Layer 3 IP routing-capable, managed switches.
- 100 Mbit networks can only have up to seven hops. A link between the Matrix and an Ethernet switch counts as a hop, each link after daisy-chaining through an access point counts as a hop.
- 1 GBit networks can only have up to 20 hops. A link between the Matrix and an Ethernet switch counts as a hop, each link after daisy chaining through an access point counts as a hop.
- The recommended maximum size is 10 access points and 40 beltpacks.
- The overlap RF coverage area between two adjacent access points should have an RSSI reading of 80 or better from each access point for error free roaming.

- In a high density beltpack coverage area with more than six access points or more than 10 access points covering the area, all access points must be within each other's -70 dBm RF coverage contour (112 or better on the beltpack's RSSI site survey screen).

3.2

Access points

The AP-1000 converts DECT signaling to the OMNEO protocol, Audinate's Dante digital high-quality audio transport over IP.

Physically connect AP-1000 units through the Ethernet network to an ODIN, OMS, or ADAM or ADAM-M intercom using an OMI card. For more information, refer to the corresponding manuals, which you can find at www.rtsintercoms.com. The intercom maintains a bi-directional OMNEO channel for each beltpack. The AP-1000 acts as the interface between the intercom and the beltpack communicating through DECT.

There are two types of access points in a Nomad system:

- Home AP
- Visitor AP

Home AP

The Home AP is any AP-1000 that configures the beltpack's BPID (Belpack ID) to one of its available OMNEO channels using IPedit.

Visitor AP

The Visitor AP is any AP-1000 that does not configure the BPID to one of the OMNEO channels in IPedit. The Visitor AP acts like a bridge that allows the visiting beltpack to communicate within the system while outside of its Home AP radius.

NOTE: The Home and Visitor labels are in reference to the beltpack. A beltpack's Home access point could be a Visitor access point to a different beltpack.

Roaming

The Nomad system enables beltpacks to roam between the radio coverage areas of one AP-1000 and another AP-1000. The system of access points monitors and maintains roaming, making it transparent to the user. Handoff from one coverage area to another is nearly seamless. Roaming does not involve any processing on the OMI, allowing the OMNEO bit stream to be completely uninterrupted.

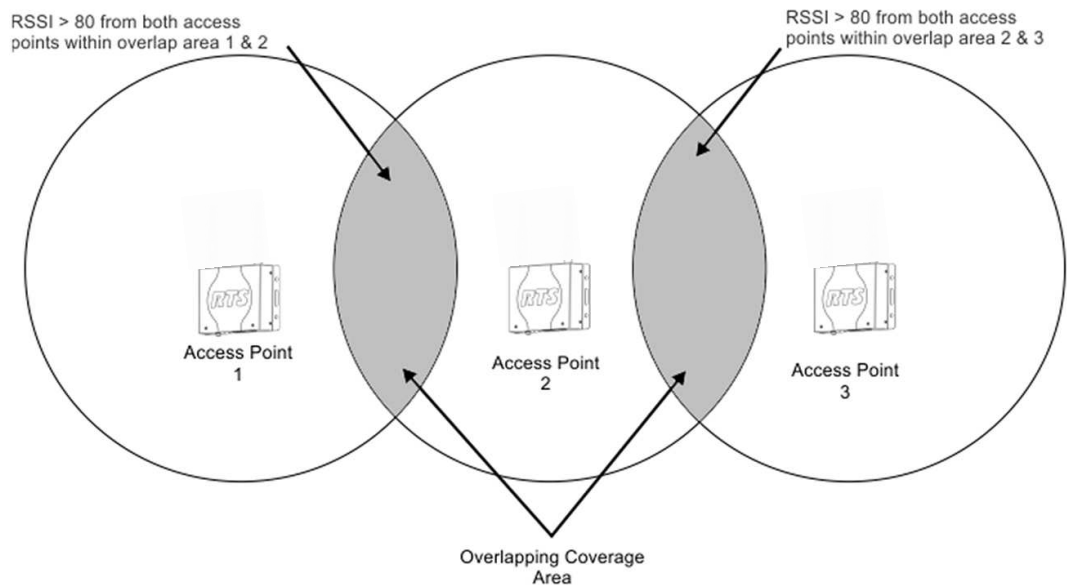
3.3

In order for seamless hand-off to occur, the AP-1000 RF coverage area must overlap. This enables the system to send the beltpack hand-off commands to both the current access point and the new access point in the coverage area.

The 80 RSSI (Received Signal Strength Indicator) contour line shown in Figure is a number related to the access point's RF signal strength as received at the beltpack. The beltpack's site survey screen measures this when testing an access point location. For more information, see Site Survey.

Notice!

When there is little or no coverage overlap, a beltpack can experience undesirable audio break-ups before the hand-off to a new access point occurs.



When access points boot, they scan the area and pick an RF carrier and time slot based upon the other beacons detected in the area. The access points also avoid using carriers and time slots already in use by using AP IDs (access point IDs). Each access point in a system must be set to a unique AP ID using the IPedit application.

In high-density beltpack areas where more than six access points can be required, some access points cannot detect an RF carrier already in use that can result in roaming issues. Avoid these scenarios by designing high-density areas with good access point overlap. Figure 3.3 shows how all seven access points can detect and coordinate carriers and time slots with each other, even when there are more than six devices present. The 112 RSSI contour line is measured by a beltpack using the site survey screen when testing an access point location. See Perform a site survey.

Notice!

If you use more than six access points to cover the same area, place all access points in a location where they can detect each other.

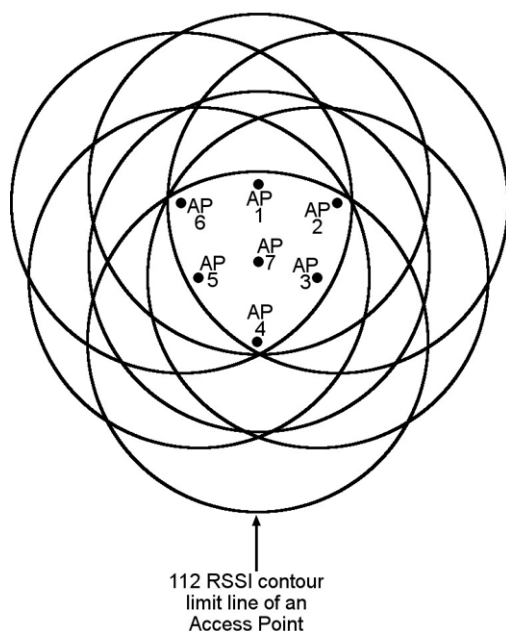


Figure 3.3: High density roaming

Home Connections

Notice!

When configuring home connections, assign the configured access point channels to the OMI card in the Matrix. For more information, see [Connect the access point to the intercom](#).

Each access point channel is a bi-directional OMNEO channel for audio, command, and control with the matrix.

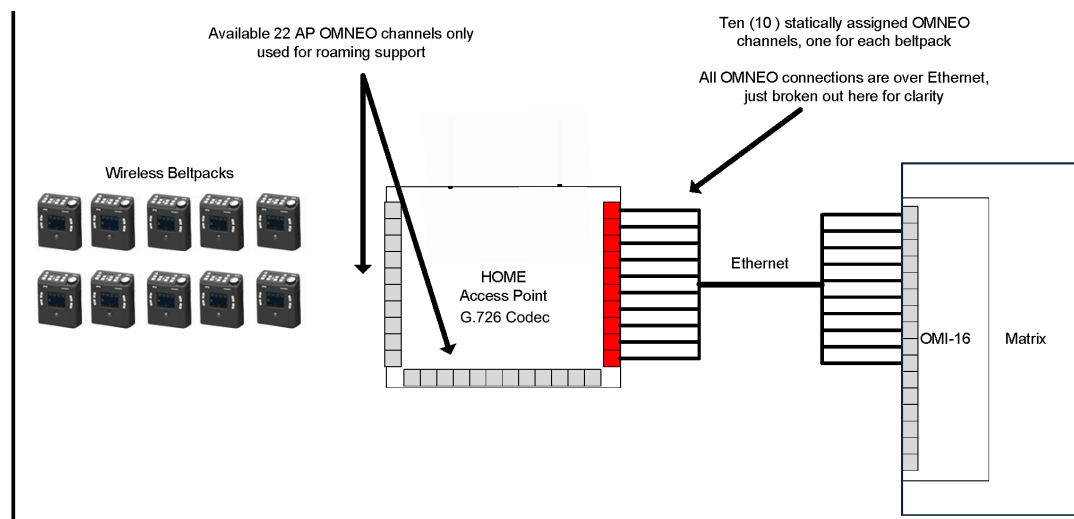


Figure 3.4: Home access point to matrix system drawing

Home to Visitor Roaming

When a beltpack roams from its Home AP to a Visitor AP, the system establishes a new OMNEO connection between both access points. However, before using the new connection's OMNEO channel, the system must confirm that the new DECT RF connection is good. The system establishes the new DECT RF connection before breaking the old connection. This means that the existing DECT

RF link to the Home AP remains active until the system confirms the new DECT RF link to the Visitor AP. Once confirmed, the system drops the existing DECT RF link and uses the new OMNEO channel from the Visitor AP.

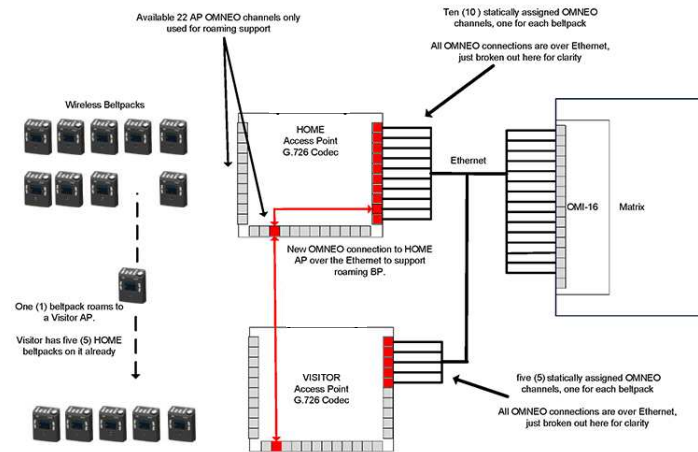


Figure 3.5: Home access point to visitor access point roaming system drawing

3.4 Site survey

Conducting a site survey is essential for planning and designing the NOMAD wireless intercom system. You can use the Site Survey application, which comes standard on the TR-1000 beltpack, to map the radio frequency (RF) coverage of AP-1000 access points. This ensures reliable communication, even in challenging environments with obstacles like metal walls or reinforced concrete.

Key Terms

- **RSSI (Received Signal Strength Indication):** This measures the strength of the RF signal between the beltpack and the access point.
- **FER (Frame Error Rate):** This measures the quality of a signal connection by indicating the ratio of errored frames to the total number of transmitted frames (lower is better).
- **DECT:** This stands for Digital Enhanced Cordless Telecommunications, the wireless protocol used by NOMAD.
- **BPID:** This is a unique 10-digit hexadecimal identifier assigned to each TR-1000 beltpack.

Prerequisites

Hardware:

- AP-1000 access point with a power supply or Power over Ethernet (POE).
- TR-1000 beltpack with a charged battery.
- Computer with an Ethernet port.
- Standard Ethernet cable.

Software:

- IPedit application installed on the computer.

Optional:

- Site map or building blueprint for marking coverage areas.

3.4.1 Prepare the hardware

Before you begin:

- Ensure all equipment is powered off before connecting cables.
- If the AP-1000 was previously configured with a static IP or connected to a matrix, reset the device to its factory defaults.

Connect the AP-1000

Standalone Setup: Use an Ethernet cable to connect the AP-1000 directly to the computer's Ethernet port.

Matrix-Integrate Setup: Connect the AP-1000 to a network switch or matrix using an Ethernet cable.

3.4.2 Setup an existing system with a static IP address

Use this method for a standalone site survey without a matrix. Assign a Link Local address to the computer to enable communication with the AP-1000.

Before you begin:

- This setup applies to Windows 10 and Windows 11. For all other operating systems, consult your network settings documentation.
- If the AP-1000 was previously configured with a static IP or connected to a matrix, reset the device to its factory defaults.

Steps

1. Ensure the AP-1000 is connected to the computer via Ethernet.
2. On the computer, go to Settings | Network & Internet | Ethernet.
(Alternatively, go to Control Panel | Network & Share Center | Change adapter settings.)
3. Right-click Ethernet and select Properties.
4. Select Internet Protocol Version 4 (TCP/IPv4).
5. Click Properties.
6. Select Use the following IP address.
7. Enter IP address 169.254.0.1.
8. Enter subnet mask 255.255.0.0.
Leave the rest of the fields empty.
9. Click OK to close the IPv4 properties window.
10. Click Close to exit the Ethernet properties window.

Troubleshooting

- If the AP-1000 does not connect, verify the Ethernet cable and power status is working (solid green light).
- If connection fails, reset the AP-1000 and repeat the process.

3.4.3

Setup an existing system with a dynamic IP address

Use this method when you perform a site survey within an existing matrix system. The AP-1000 obtains an IP address through DHCP (Dynamic Host Configuration Protocol).

Before you begin:

- Ensure the matrix's DHCP is enabled in the AZedit software application.
- If the AP-1000 is already part of an operating system with a subscribed TR-1000, no further IP configuration is needed. Power off other AP-1000 devices to isolate the tested access point.

Steps

1. Use an Ethernet cable to connect the AP-1000 to the matrix or network switch.
If the switch is not PoE, connect the AP-1000 to a power supply.
2. Power the AP-1000 on.
A solid green light appears.
3. Open the IPedit software.
4. Configure the OMI card with the AP-1000.

Troubleshooting

- If the AP-1000 does not receive an IP address, confirm that DHCP is enabled in AZedit and check the network switch connections.

3.4.4

Add the access point to IPedit

IPedit is a software tool used for managing and editing IP addresses and related network configurations. It typically allows users to modify IP address settings, manage DHCP assignments, and handle DNS (Domain Name System) configurations.

Before you begin:

- Ensure the AP-1000 is on and connected to the network.

Steps

1. Open the IPedit software application.
2. From the Device menu, select Add.
The Add Devices screen opens.
3. In the Add Devices window, select the AP-1000.
AP-1000 devices are listed.
4. Click Add.
The AP-1000 appears in the Device Catalog.
5. Click Done, to close the window.

Troubleshooting

- If the AP-1000 does not appear, verify it is powered on and connected. Refresh the device list in IPedit.

3.4.5

Assign the TR-1000 to an AP-1000 channel

In this step, you link the TR-1000 to a specific AP-1000 channel by using its BPID (Beltpack ID). This process involves identifying the unique Beltpack ID associated with the desired AP-1000 channel, which allows for precise communication and control between the TR-1000 and the AP-1000.

Before you begin:

- Note the AP-1000's System ID (default: B2B) and PIN (default: 0000) in IPedit. You will use this to subscribe the TR-1000 to the AP-1000 in the next section.

Steps

1. Open the IPedit software application.
2. From the device catalog, select the AP-1000.
The Device Information fields populate with the AP-1000's information.
3. Check the Sync Master check box to designate the AP-1000 as the primary sync source.
4. Turn on the TR-1000 and note the BPID.
 - The BPID is a 10-digit hexadecimal displayed on the front panel. For example, 00:03:22:B5:21.
5. In IPedit, enter the TR-1000 BPID in the DECT BPID field for the desired channel.
6. From the Changes menu, select Send All.
The Send Changes window opens.
7. Click OK.
 - Wait approximately one minute for the AP-1000 to reset. The Sync box turns green, indicating the BPID is in stored.

Troubleshooting

- If the Sync box does not turn green, verify the BPID is correct and send changes, if necessary.

3.4.6**Subscribe the TR-1000 to the AP-1000**

Subscribing the TR-1000 to the AP-1000 wirelessly links the devices using the System ID and PIN.

Before you begin:

- Ensure the beltpack is within 40 feet (12 meters) of the AP-1000.
- Have the AP-1000's System ID and PIN accessible.

Steps

1. Turn on the TR-1000.
The front display turns on.
2. Press the MENU button.
3. Navigate to System Setup.
4. Press the Select button.
5. Navigate to Subscription Setup.
6. Press the Select button.
7. Navigate to Enter System ID.
8. Enter the AP-1000 System ID.
9. Press the Select button.
10. Navigate to Enter PIN.
11. Enter the AP-1000 PIN.
12. Press the Select button.
13. Verify the subscription by looking at the TR-1000 home screen.
 - The active DECT connection and RSSI icons indicate a successful subscription.

Troubleshooting

- If the subscription fails, verify the System ID and PIN.
- Ensure the beltpack is close to the AP-1000 and retry.

3.4.7

Perform a site survey

A site survey determines the placement of the access points to make sure RF covers of the desired area. A beltpack, communicating with an access point at a test location is set to the site survey screen where RSSI (Received Signal Strength Indication) and FER (Frame Error Rate) to find the RF coverage area.

Pre-conditions

- A beltpack that is successfully subscribed to an access point.
- A site map or blueprint of the building that you can mark up.
- You can supply power to the access point at the possible test locations by using battery power.

To **perform a site survey**, do the following:

1. Place the **access point** in the location you want to test for coverage.
2. Power up the **access point**.
The access point is ready when the power light turns to solid green.
3. Power up the **beltpack**.
The splash screen momentarily shows before the home screen appears.

Notice!

When the beltpack finishes booting, the home screen of the beltpack indicates a wireless connection. If the wireless connection does not display, verify the settings in Set up Site Survey.

4. Press the MENU button.
5. Use the up and down arrow buttons to navigate to the **System Setup icon**.
6. Press the Select button.
7. Use the up and down arrow buttons to navigate to the **Site Survey icon**.
8. Press the Select button.
9. Mark the access point's location on the building layout diagram.
10. Walk around with the beltpack throughout the area(s) of interest while looking at the site survey screen.

Notice!

Record the RSSI and FER number on the building layout diagram at several locations throughout the area of interest.

Site survey screen

Graphic here

Description of Site Survey Screen

CARRIER	The current RF carrier of the access point. This may change from time to time.
SLOT	The current time slot on the RF carrier the access point to the beltpack packets are located. This may change from time to time.
AP ID	Access Point Identification

RSSI	Radio Signal Strength Indication
FER	Frame Error Rate. This represents the number of packets not received out of the number of packets sent.

Description of RSSI

RSSI	Color	Description
0-47	Red	Weak - poor to no reception in the area
48-70	Yellow	Marginal - some dropouts of audio in the area
71-216	Green	Strong - good RF coverage

Description of FER

FER	Color	Description
21 - 100%	Red	Weak - too many dropouts in the area
11 - 20%	Yellow	Marginal - some dropouts of audio in the area
0 - 10%	Green	Strong - good RF coverage

DEFINITION OF GOOD COVERAGE AREA
RSSI = 71-216, Site survey bar in the green. FER= 0 -10%, Site survey bar in the green. If the two indications are different, always use the worst case of the RSSI and QF indication for defining a good coverage area. Example: FER = 10 and RSSI = 71, use the RSSI level as the cutoff for the good coverage area.

Notice!

When you collect enough data points, use the coverage limits to draw a line on the building layout. If surveying for roaming coverage, refer to the access point coverage in Roaming.

3.4.7.1

Conduct the site survey

Before you begin:

- Ensure the TR-1000 is subscribed to the AP-1000
- Have a site map or blueprint to mark coverage areas
- Power the AP-1000 at test locations

Steps

1. Place the AP-1000 at the test location.
1. Power the AP-1000 on.
2. Turn on the TR-1000.
3. Verify the wireless connection on the home screen (DECT/RSSI icons).
4. Press the MENU button.
5. Navigate to System Setup | Site Survey.

6. Press Select.
 - The site survey screen displays RSSI, FER, and other metrics.
7. Mark the AP-1000's location on the site map.
8. Walk through the area with the beltpack, monitoring the site survey screen.
9. Record RSSI and FER values at multiple points on the site map.

3.4.7.2

Interpret site survey metrics

Key RF metrics

Metric	Description
Carrier	Current RF carrier of the AP-1000
Slot	Time slot for beltpack packets
AP ID	Unique identifier for each AP-1000
RSSI	Signal strength (higher is better)
FER	Frame rate error (lower is better)

RSSI Levels

RSSI thresholds for good, marginal, and weak are typically found experimentally.

Range	Color	Description
0-47	Red	Weak: poor or no reception
48-70	Yellow	Marginal: some audio dropouts
71-216	Green	Strong: Good RF coverage

Defining good coverage

Mapping

- Draw coverage boundaries on a site map based on RSSI/FER data.
- For roaming systems, ensure overlapping coverage areas.

3.4.7.3

Tips for optimal coverage

- Adjust AP-1000 Placement:
 - Test multiple locations to improve RF coverage if RSSI is low or FER is high.
- Roaming Systems:
 - Ensure coverage areas overlap with RSSI > 80 from each AP-1000 for seamless roaming.
- High-Density Areas:
 - When using multiple AP-1000s for many beltpacks, position access points within -70 dBm of each other (RSSI ≥ 112).

3.4.7.4 Troubleshooting common site survey issues

Solutions to frequent problems encountered during site survey setup and execution.

Issue	Possible Cause	Solution
Beltpack fails to subscribe to AP-1000	Incorrect System ID or PIN entered	Verify the System ID (default: B2B) and PIN (default: 0000) in IPedit; re-enter on beltpack. Ensure beltpack is within 40 ft (12 m) of AP-1000.
No wireless connection on beltpack	AP-1000 not powered or not synced	Check AP-1000 power light (should be solid green). Verify Sync Master setting in IPedit and resend changes.
Computer cannot connect to AP-1000	Incorrect IP configuration	For static IP, ensure computer is set to 169.254.0.1 with subnet 255.255.0.0. For dynamic IP, confirm DHCP is enabled in AZedit
Poor RSSI/FER readings	Obstacles (e.g., metal walls) or interference	Reposition AP-1000 to a higher or more open location. Test alternative locations and note RSSI/FER on site map
AP-1000 not listed in IPedit	Network issue or AP-1000 not powered	Ensure AP-1000 is powered (solid green light) and connected via Ethernet. Restart IPedit or refresh device list
Beltpack shows no DECT connection	Beltpack not assigned to AP-1000 channel	In IPedit, enter the beltpack's BPID (10-digit hexadecimal on beltpack display) and send changes
Site survey screen not accessible	Beltpack not subscribed or in wrong menu	Confirm subscription (DECT and RSSI icons active on beltpack). Navigate to System Setup > Site Survey on beltpack menu

4 Installation

4.1 Connecting the AP-1000 and the TR-1000

4.1.1 Add ODIN to the device catalog in IPedit

1. Open **IPedit**.
2. From the Device menu, select **Add**.
The Add Devices Window appears.
3. Select the **ODIN**.
The Add button becomes active.
4. Click **Add**.
The ODIN appears in the device catalog in the left panel.
5. Click **Done**.
The Add Devices window closes.

4.1.2 Configure the ODIN using IPedit

1. In the Device Name field, enter the **device name**.
Initially, ODIN cards are given a default name.

Notice!

Changing the device name causes the device to reboot. It is not necessary to change the device name. However, if changed, it is best to do this early in the setup so revisiting other devices that connect to this device and updating them later is not necessary.

2. In the Description field, enter a **description** for ODIN, if desired.
Using the Channel Configuration and Status Pane
3. In the Channel Description field, enter a **channel description**, if applicable.
4. From the Destination Type drop down menu,

Notice!

The Destination Type does not need to be selected if using the Browse window to select the device. It fills the Type and IP Address automatically.

5. In the Destination Device Name field, enter the **name of the device** to which the channel will connect.
OR
Click the ... button.
The Discovered Devices Window appears.
 - Expand the **tree** to view the destination devices available.
 - From the expanded tree, select the **destination device**.
 - Click **OK**.
6. From the Destination Channel drop down menu, select the **channel** to which the ODIN will connect.
7. Send the **changes** to the ODIN.

4.1.3 Add the AP-1000 to IPedit

4.1.4 Configure the TR-1000 to its home AP

To assign a **beltpack** to an **access point channel**, do the following:

1. From the Device Catalog in IPedit, select the **AP-1000**.
The Channel Configuration populates.

Channel 1	
Channel Configuration	
Intercom Alpha	F255 : NE (N025)
Channel Description	B2-40 C
Destination Type	☐ OMI-64
Destination Device Name	RTS
Destination IP Address	192.168.2.82
Destination Description	
Destination Channel	Channel 25
Destination Channel Description	
Receiver Latency	1 ms
DECT BPID	BP00:09:22:b3:e9

2. Power up the **beltpack**.
The BP ID displays on the front panel. This is a 10 digit, hexadecimal number in the format of: BP00:09:XX:XX:XX.
3. In the DECT BPID field, enter the **beltpack ID** to assign to that channel.
4. From the Changes menu, select **Send Changes**.
The Send Changes window appears.
5. Click **OK**.
The changes are sent to the access point. The AP stores the BPID even if power is disconnected.

4.1.5 Register the TR-1000 and connect to the AP-1000

4.2 Access point placement

4.2.1 RF considerations

4.2.2 DECT configuration options

4.2.3 Mounting options

4.2.3.1 Wall or ceiling mount

You can mount the AP-1000 to either a wall or a ceiling, depending on your specific environment, intended usage, and the optimal coverage area you wish to achieve. By selecting the appropriate mounting location, you can enhance the performance of the access point and ensure that it effectively meets your wireless connectivity needs. Consider factors such as the layout of the space, potential obstructions, and the areas where you require the strongest signal when deciding on the best mounting position. For more information, see *System overview*, page 23.

Notice!

We recommend that this device not be mounted in a high traffic area where it could be accidentally dismantled. Always observe local codes and requirements.

Before mounting the bracket:

- It may be necessary to predrill the holes or use screw anchors, depending on the type of mounting surface.
- Use the information in *Mounting surfaces*, page 44 to determine the number of screws and type of screws needed for the chosen surface.
- The screw spacing is not consistent with standard residential stud spacing. You may need to use appropriate wall anchors if mounting the AP-1000 on a gypsum wall.

Caution!

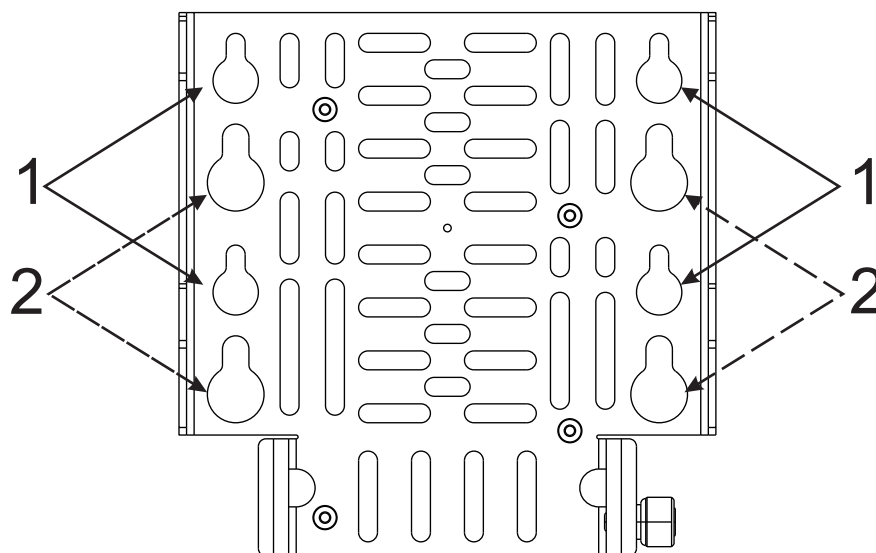
Proper wall or ceiling mounting

To reduce the risk of injury to yourself or damage to the device:

- Follow all instructions provided.
- Ensure the wall structure/materials will support the weight of the device.
- Use the recommended hardware for your device based on the wall structure/materials.
- Additional reinforcement may be required depending on the wall structure/materials the device will be installed and local codes and standards.

**Install the mounting bracket:**

1. Determine the size of screw you are using and which keyhole you need to use.



2. Using the mounting bracket as a template, mark the four screw hole locations on the wall or ceiling with a pencil.

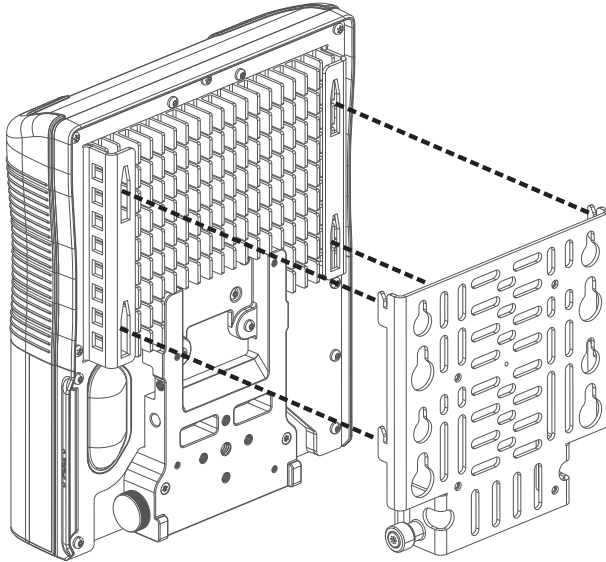
Notice!

Depending on the screw size used, mark either the small or large keyhole pattern.

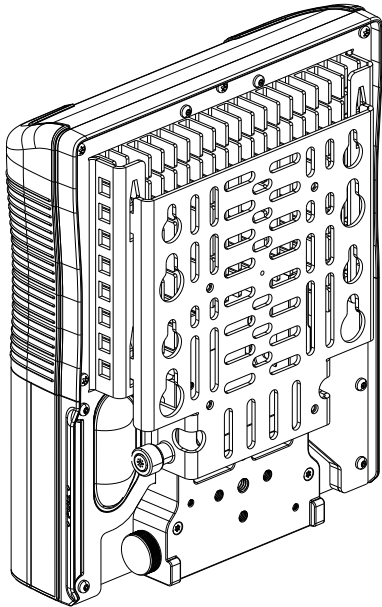
3. Install screws, flat washers, and anchors (if using) in marked locations.
 - Be sure to leave enough room between screw head and the mounting surface to slide the mounting bracket into place.
4. Align the bracket's keyhole openings with the screw heads.
5. Press and slide the bracket so that you position the heads of the screws within the narrow portion of the keyhole.
6. Tighten the screws against the bracket to keep it firmly in place.

Attach the AP-1000 to the mounting bracket:

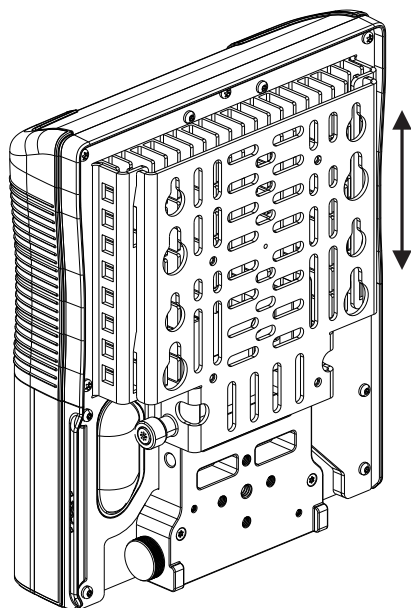
1. Locate the bracket guides on the rear panel of the AP-1000.
2. Align the bracket hooks with the guides.



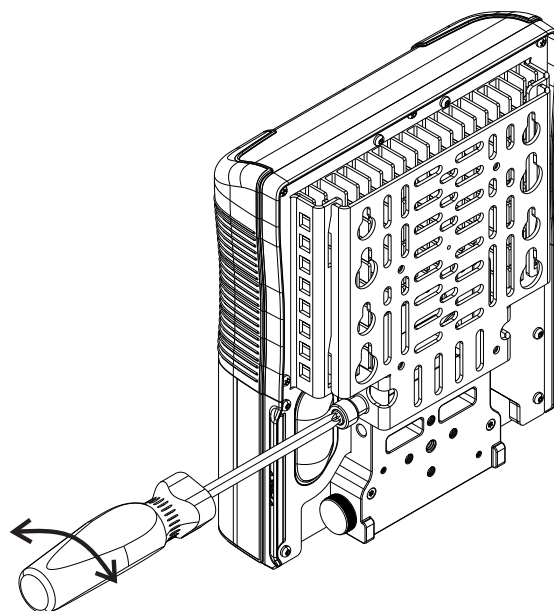
3. Pass the hooks through the guides to attach the bracket to the AP-1000.



4. Slide the AP-1000 to engage the hooks fully in the guides.



5. Using a #2 Phillips screwdriver, tighten the thumbscrew to secure the AP-1000 to the bracket.



Refer to

- Mounting surfaces, page 44
- System overview, page 23

4.2.3.2

Pole mount

Use the optional accessory mounting kit to attach the Access Point securely to a pole. This method allows you to effectively enhance your wireless network by elevating the Access Point for better signal reach.

1. Align the mounting clamp in the pole use position on the back of the AP-1000.
2. Using the supplied screws from the mounting kit, attach the mounting clamp to the AP-1000.
3. Fit the mounting clamp around the pole.
4. Once in position, use the adjustment knobs to tighten the clamp to the pole

Notice!

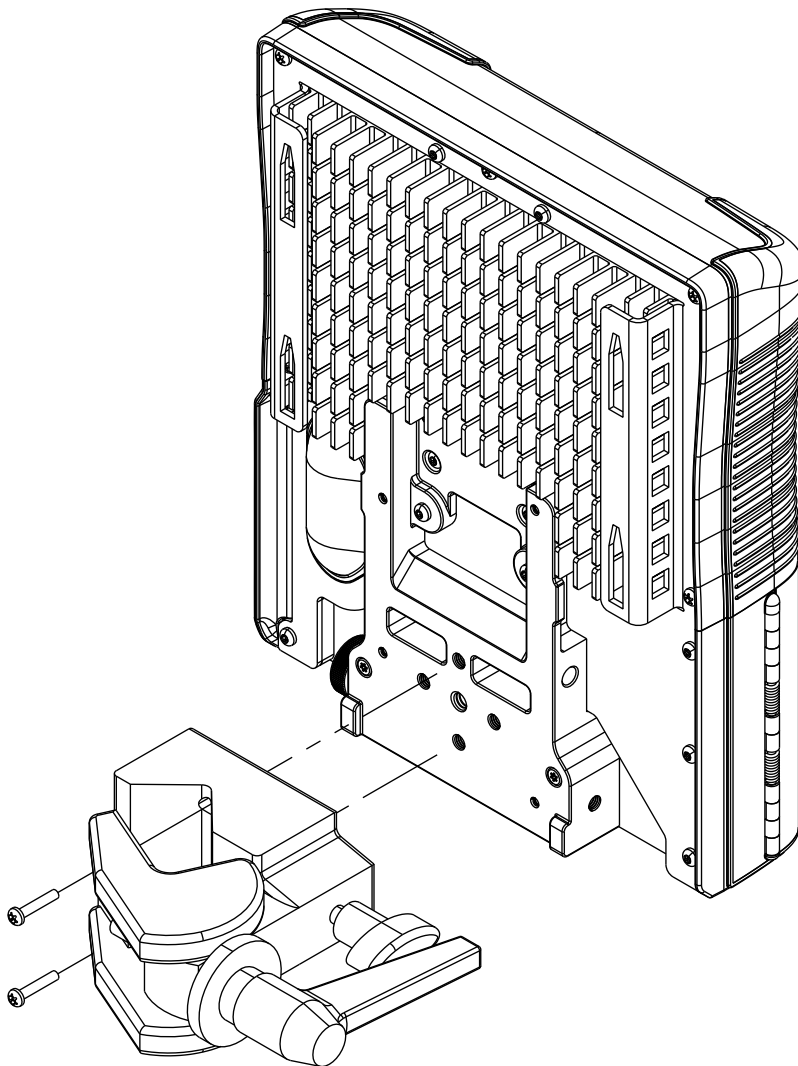
Once the AP-1000 is securely mounted, double-check its stability and adjust its angle if needed to maximize coverage in the intended area.

4.2.3.3**Super clamp**

Super Clamps are versatile tools that allow you to mount the AP to various surfaces, including poles, tables, and rafters. You can use them to create custom rigging setups, enabling you to attach the AP at different angles and positions. The super clamp design allows them to clamp onto a variety of shapes and sizes, making them useful for securing equipment to non-standard surfaces. Furthermore, Super Clamps can stabilize gear in situations where traditional mounting options are unavailable. You can attach the Super Clamp to the AP in two ways: either vertically or horizontally.

Attach the Super Clamp in the vertical position

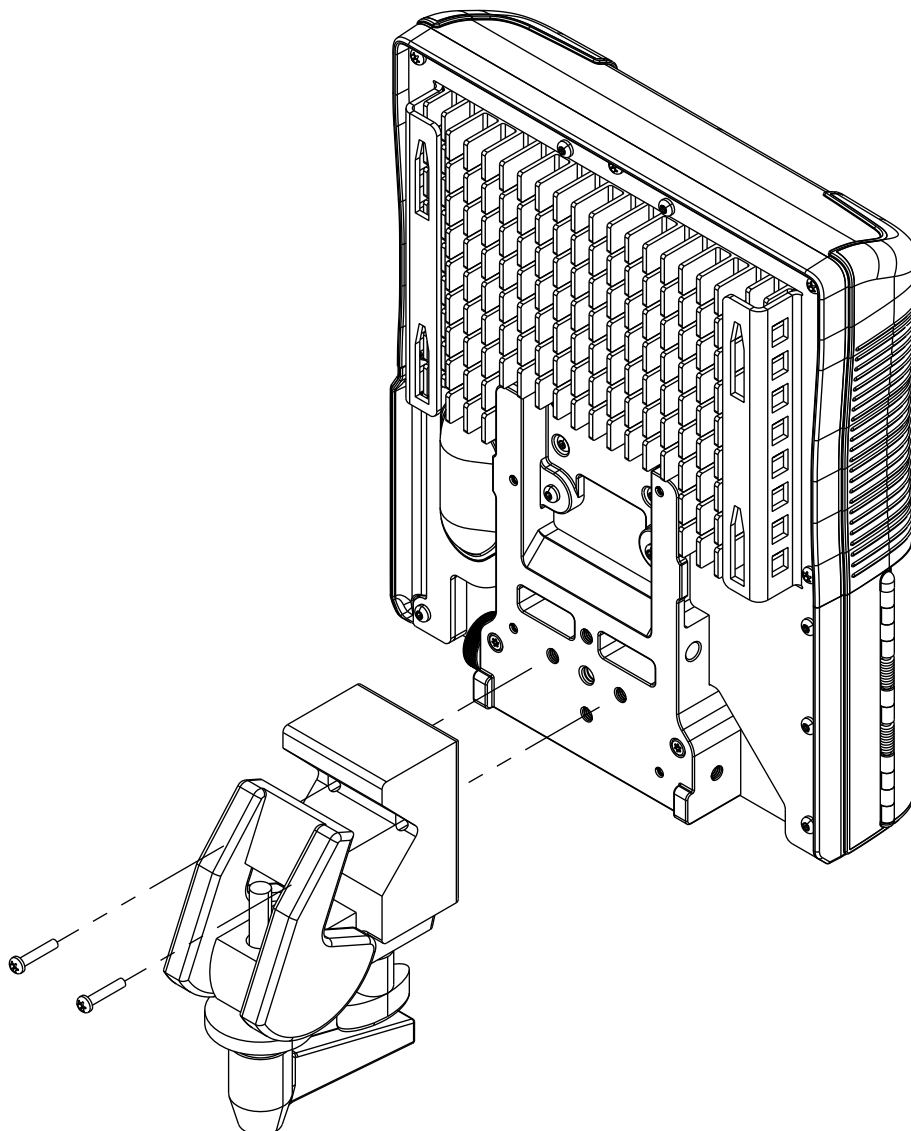
1. Align the mounting clamp in the vertical position on the back of the AP-1000.



2. Using the supplied screws from the mounting kit, attach the mounting clamp to the AP-1000.
3. Fit the mounting clamp around the mounting surface.
4. Once in position, use the adjustment paddle to tighten the clamp to the mounting surface.

Attach the Super Clamp in the horizontal position

1. Align the mounting clamp in the horizontal position on the back of the AP-1000.



2. Using the supplied screws from the mounting kit, attach the mounting clamp to the AP-1000.
3. Fit the mounting clamp around the mounting surface.
4. Once in position, use the adjustment paddle to tighten the clamp to the mounting surface.

4.2.3.4 5/8" (16mm) hex spigot-type mount

1. Loosen the thumbscrew locking mechanism to clear the opening.
2. Place the 5/8th connector in the opening. It should fit snugly in the hexagonal opening.
3. Tighten the thumbscrew locking mechanism. Make sure it is tight enough to prevent any movement, but avoid overtightening, as this could damage the spigot or mount.

4.2.3.5 5/8-27 thread mount

1. Screw the 5/8-27 connector into the 5/8-27 thread mount receptor.

4.2.3.6 3/8-16 thread mount

1. Screw the 3/8-16 microphone stand connector into the 38-16 mounting slot.

4.2.3.7

1/4-20 thread mount

You can use the 1/4-20 mount option in two ways: from the bottom of the unit or from the back of the unit. Mount the AP vertically on the stand using the bottom mount position. Mount the AP horizontally on the stand using the back mounting position.

Mount the AP vertically on the stand

- ▶ Screw the 1/4-20 thread connector into bottom connector receptacle.

Mount the AP horizontally on the stand

- ▶ Screw the 1/4-20 thread connector into back connector receptacle.

4.2.3.8

Kensington lock feature

Notice!

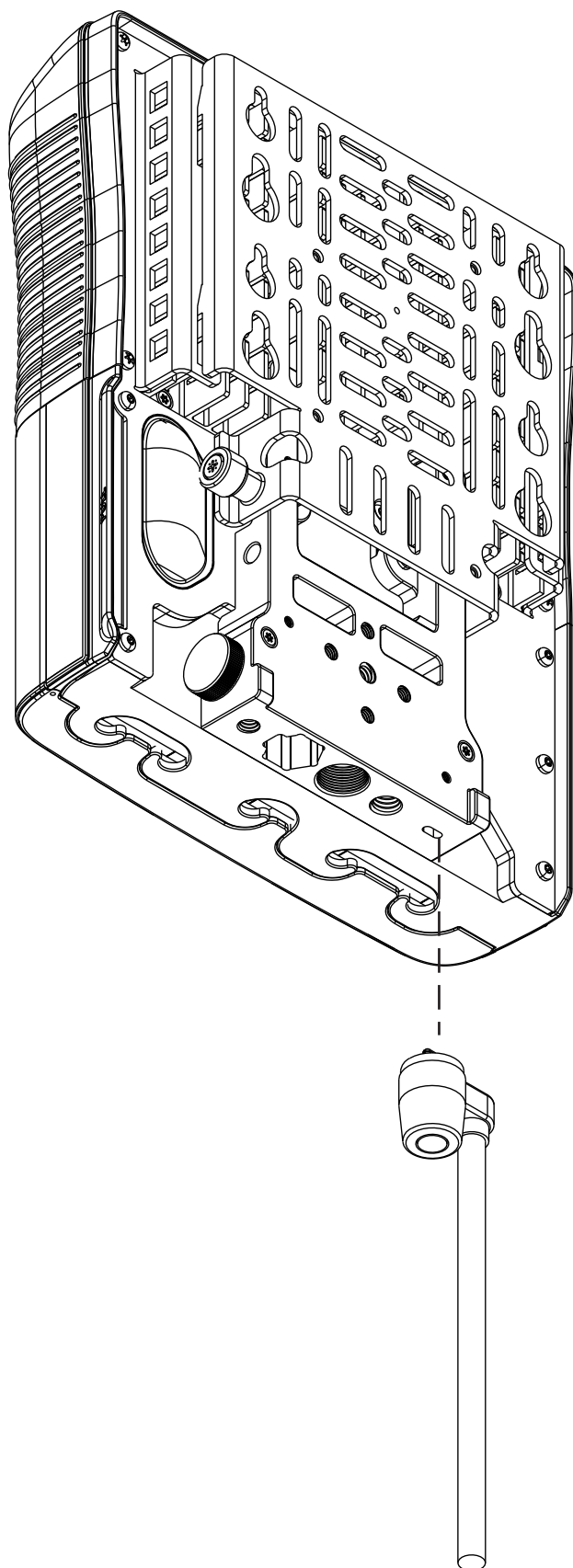
The security slot is compatible with the Kensington Security Slot™ and the Kensington Nano Security Slot™.

Prepare the lock

- If using a combination lock, set it to the current combination
- If using a keyed lock, ensure you have the key ready

Install the lock

1. Loop the steel cable to the anchor point.
2. Ensure the anchor point cannot be easily lifted or moved
 - Keep the cable length reasonable to avoid tangling
3. Insert the T-bar of the Kensington lock into the security lock on the bottom of the unit.
 - For combination locks: scramble the numbers
 - For keyed locks: turn the key to lock and remove it



4. Gently pull on the device to verify the lock is engaged
5. Check that the cable is properly secured to the anchor point

Important Notes:

- Never force the lock - it should insert and rotate smoothly
- Store keys/combinations in a safe place
- Check periodically that the lock remains secure

4.2.3.9**Fall-arrest cable**

When mounting the AP on the ceiling or in the rafters, you want to ensure it does not fall causing injury or damaging the unit with a fall. There are two ways to attach a safety cable: to the mounting bracket or to the mount block.

Attach the safety cable to the mount block

1. Thread the one end of the fall-arrest cable through the AP mount block as shown.
2. Crimp a ball shank on the end of the cable.
3. Attach the other end of the fall-arrest cable to a sturdy structure near the AP mounting point.

Attach the safety cable with the mounting bracket

- 1.

4.2.4**Mounting surfaces**

Mounting Surface	Materials Used	Size	Quantity
Drywall			
	Drywall screws	#8 or M4 minimum	4
	Aluminum drywall anchors, as needed	50 lbs (23 kg) weight capacity minimum	4
	Flat washers	1/4" or M6 maximum	4
Concrete			
	Concrete screws	1/4" or M6 maximum	4
	Concrete anchors, as needed		4
	Flat washers	1/4" or M6	4
Wood			
	Wood screws	1/4" or M6 maximum	4
	Flat washers	1/4" or M6	4
Metal			
	Sheet metal screws or self-tapping screws or self-drilling screws or machine screws	1/4" or M6 maximum	4
	Flat washers	1/4" or M6	4
	Machine nut, as needed	1/4" or M6	4

5 TR-1000 basic operation

5.1 Navigation basics

There are five basic buttons to navigate through the Digital Belt Pack menu system.

A/C shaft encoder ¹	Controls the master volume and by pressing the shaft encoder, toggles the control to Key A or Key C listen volume. Scrolls through the menu items when in a menu or sub-menu. In most situations, pressing the A/C shaft encoder button behaves the same as pressing the CLR/BACK button. Some exceptions to this are when editing a device name and when deleting a character. Used to edit a menu item value/state in an active menu. Exits the current menu item or aborts editing of the highlighted menu item (applies to the shaft encoder as a push button).
B/D shaft encoder ¹	Controls the master volume and by pressing the shaft encoder, toggles the control to Key B or Key D listen volume. Controls Key B and Key D volume. Scrolls through the menu items when in a menu or sub-menu. In most situations, pressing the B/D shaft encoder button behaves the same as pressing the SEL/MENU button. Some exceptions to this are when editing a device name and when inserting a character. Enters a sub-menu, activates a menu item, or saves changes to an activated menu item (applies to the shaft encoder as a push button).
SEL/MENU button	Enters the menu from the home screen. Selects a sub-menu from the main menu. Activates the selected menu item. Saves changes in an activated menu item and deactivates the menu item. Dismisses popup notifications. Confirms choice in some popup dialogs.
CLR/BACK button	Shows or hides the CWW window from the home screen. Exits the menu (or moves back one level in the menu if in a sub-menu). Discards changes in an activated menu item. Dismisses popup notifications. Declines/aborts choice in some popup dialogs. Displays the Connection state.
CALL button	Generates outgoing CALL signals.

1. In some activated menu items, the A/C and B/D shaft encoders behave differently. Specifically, when editing device/domain names or IP addresses, the A/C shaft encoder moves the cursor between letters or octets and the B/D shaft encoder change the value of the currently highlighted letter/octet. Similarly, in the Mixer menu, the A/C shaft encoder selects the input to modify for the currently active output, and the B/D shaft encoder enables/disables the mix from the selected input to the active output.

To **enter and navigate the menu structure**, do the following:

1. Press the **SEL/MENU button**.
The main menu structure appears in the display.
2. Rotate either **shaft encoder** to navigate through the menu.
3. Click the **B/D shaft encoder** to select a menu item
OR
Press the **SEL/MENU button** to select a menu item.
4. Click the **A/C shaft encoder** to back out of a menu
OR
Press the **CLR/BACK button** to back out of a menu.

5.2 Main screen icons

5.3 UI controls

UI Control	Type	Description
	Input field	The A/C shaft encoder and the B/D shaft encoder do different actions. For example, while editing an IP address or a text field (like the device name or domain), the A/C shaft encoder moves the “cursor” between octets or characters, and B/D shaft encoder adjusts the value/character at the cursor position.
	Binary choice	Use either shaft encoder to choose between two options.
	Tri-choice	Use either shaft encoder to switch between three options.
	Spinner	Use either shaft encoder to scroll through the list of options.
	Bar graph	Use either shaft encoder to increase or decrease the setting.
	Mixer type	The A/C shaft encoder and the B/D shaft encoder do different actions. For example, while configuring Mixer settings, the A/C shaft encoder would select the input source and the B/D shaft encoder changes the state of the mix. NOTE: You can select more than one option simultaneously.

5.4 Hot keys

HOME screen:		
	Press and release the SEL/MENU button	Enter menu mode.
	Press and release the CLR/BACK button	Displays the CWW. Press CLR/BACK to dismiss the CWW.
	Press and hold the CALL button (in PL Mode)	Initiates an outgoing CALL signal for whichever Talk keys are currently on with PL assignments. The CALL signal lasts until you release the CALL button
	Press and hold the CLR/BACK button (in Keypanel Mode)	Acts as SHIFT. Press any TALK keys while holding the SHIFT key toggles the key to a LISTEN state. Release the CLR/Back button to exit SHIFT mode.
	Press and hold the CLR/BACK button and then press and release the CALL button.	Displays the Connection status. The Connected popup displays if you have a connection to an intercom and shows the port number and alpha for the connection. The Disconnected popup displays if you do not have a connection to the intercom and it shows the device name and IP address. Press the CLR/BACK or SEL/MENU button to exit.
	While a phone call is active, press and hold the CLR/BACK button and then press and hold the CALL button.	Displays the Phone Call Management popup window. Use the shaft encoders to select an option and then press the SEL/MENU button to activate that option. There are two options, Hang Up and To Intercom. To Intercom is a mixer toggle on/off option. Press CLR/BACK to dismiss.
	Press and hold the CLR/BACK button and then press and hold the SEL/MENU button until the lock icon appears (or disappears if starting from the lockout state)	Toggle control lockout on and off. To unlock, repeat the sequence.
	Press and hold the CLR/BACK button and then press and release one of the Master Volume Controllers	Toggle between display off, display dim, and display dark modes. You can also use the Display Mode menu item in the Display menu to make these changes.
	While Key Volume is active, press and hold one of the shaft encoder buttons until the volume mutes (or unmutes if starting from the mute state).	The key assignment is muted. To unmute the key, repeat the sequence.

	NOTE: Use the A/C shaft encoder to mute TALK key A or TALK key C; use the B/D shaft encoder to mute TALK key B or TALK key D.	
Receiving an incoming call signal:		
	Pressing the TALK key cancels the CALL beep and vibration.	If the TALK key is on, it stays on when you release the TALK button. If the TALK key is not on, it turns on and stays on if you let go within the latching period.
MENU mode:		
	Press and release the CLR/BACK button with menu highlighted	Go back one level (exits the MENU if at the top level).
	Press and release the CLR/BACK button with widget highlighted	Aborts all changes made and moves the highlight back to the menu
	Press and hold the CLR/BACK button	Exits the menu structure (aborts any widget change in process)
	Press and release the MENU/SEL key (with a menu item highlighted)	Invokes the highlighted menu item (may go to a lower-level menu, or activate the widget associated with the highlighted menu item).
	Press and release the MENU/SEL key (with a widget highlighted)	Deactivates the widget (moves highlight back to menu item) and saves the current widget state (as current operating mode)
	Press the A/C shaft encoder button	Go back one level (exits the MENU if at the top level). Behaves the same as the CLR/BACK button in most situations.
	Press the B/D shaft encoder button	Invokes the highlighted menu item (may go to a lower-level menu, or activate the widget associated with the highlighted menu item). Behaves the same as the SEL/MENU button in most situations.
	Rotating either shaft encoder (with a menu item highlighted)	Moves the menu item highlight to the next or previous menu item.
	Rotating either shaft encoder (with a widget highlighted)	Adjusts/edits the data represented by the widget. For many widget types, A/C shaft encoder and B/D shaft encoder are treated the same.

		For example, adjusting a gain or brightness, or selecting a value in a spin control, or changing the state of an binary or tri-state widget, can all be done by rotating either shaft encoder
		For a few widget types, the A/C shaft encoder and the B/D shaft encoder do different actions. For example, while editing an IP address or a text field (like the device name or domain), the A/C shaft encoder moves the “cursor” between octets or characters, and the B/D shaft encoder adjusts the value/character at the cursor position. The same is true for the Mixer widget, where the A/C shaft encoder would select the input source and the B/D shaft encoder changes the state of the mix.
	Pressing and releasing the CALL button while in the menu	Behaves the same as when you are on the Home screen (for example, send CALL signal or activate SHIFT mode, depending on whether the DBP is in PL mode or KP mode).
	Press and hold the CLR/BACK button, and then press and release the SEL/MENU button	Jump to last viewed widget

5.5 Modes of operation

5.5.1 PL mode

5.5.2 Keypanel mode

5.6 Volume adjustment

There are two volume adjustments available on the belt pack: Master Volume and key Listen volume.

5.6.1 Master volume adjustment

To **adjust the master volume**, do the following:

- ▶ Click or rotate **either shaft encoder**.

A volume bar appears on the display screen. The volume bar increases or decreases depending on the adjustment made. The belt pack exits volume adjustment mode after a few seconds of inactivity.

If the Master Volume is muted, the home screen displays a speaker mute symbol.

5.6.2 Individual key volume adjustment

To **adjust individual listen volumes for Key A and Key C**, do the following:

1. Click either **shaft encoder**.
The master volume activates.
2. Click the **A/C shaft encoder once for key A and twice for key C**.
The listen volume adjustment for the key activates and a volume bar appears on the key.

3. Rotate the **A/C shaft encoder** to adjust the volume.
The volume bar increases or decreases depending on the adjustment made. The belt pack exits volume adjustment mode after five seconds of inactivity.

Notice!

To adjust the volume for key B and D, follow the same instructions for key A and C, except use the B/D shaft encoder.

5.6.3 Adjust volume for OMNEO and Bluetooth input volumes

5.6.4 Mute a PL key assignment

5.6.5 Adjust matrix level in AZedit

5.6.6 Verify speaker dim setting

5.7 Call signaling

Use **Call Signaling** to alert party line users that there is incoming audio on the line. By default, call signaling uses the flashing call button to alert party line users. However, enabling call alerts allows a beep or a vibration to signal incoming audio on the line. For more information on call alerts, see Call Alerts.

For example, a producer starts talking to a camera operator on PL01 and the camera operator does not hear the producer because they are not wearing their headset. The producer can send a call signal alert to PL01 that generates a call beep or vibration (if enabled) that would let the camera operator know someone is talking and to put their headset on.

Notice!

Do not confuse call signaling with incoming calls. Party lines use call signaling to notify users that someone is trying to get their attention. Incoming calls are direct point-to-point calls from another panel to the belt pack.

To **send a call signal**, do the following:

1. Press and hold, or latch on the **talk keys** for which you want to send the signal.
2. Press the **CALL** button.

The red talk key indicators turn blue and the call signal icon shows in the center of the display.

Notice!

The call signal generates for as long as you hold the CALL button and the talk keys are still on.

Notice!

In KP mode, only the key tile tallies to alert the user of an incoming call.

1. Release the **CALL button** or turn off the **talk keys** to end the call signal.

5.8 Talk and listen

The Talk and Listen functions on the DBP act like any traditional keypanel.

Talk

There are four configurable modes of talk operation: Latching, Momentary, Always On, and Always Off. For detailed descriptions about the modes of operation and how to configure Talk operation, see Setup | Key Modes.

To **talk**, do the following:

1. Press and hold, or latch on, the **key** with the assignment to which you want to talk.
2. Release the **key**, or tap it to unlatch it, to stop talking.

Listen

Listen key operation is the same as talk key operation, except that listen keys are always latching and you need to press and hold the CALL/SHIFT button so that A - D key presses are treated as listen key presses, not talk key presses.

Access to listen key states using the CALL/SHIFT button is only available in KP mode.

In PL mode, the listen keys are Always On (for PL assignments) and Always Off (for any other type of assignment). For instruction on how to mute PL assignments on the belt pack, see Volume adjustment.

To **listen**, do the following:

1. Press and hold the **CALL button**.
2. Tap the **key** for which you want to change the listen key state.

7 TR-1000 menu structure

7.1 Beltpack menu

7.1.1 Key assignment

Use the **Key Assignments** menu item to configure talk key assignments. Depending on what the belt pack connects to, there are two modes of operation, PL Mode and Keypanel Mode. For more information, refer to Modes of operation.

To **configure talk key assignments in PL mode**, do the following:

Notice!

In PL mode, the beltpack supports only PL (party line), RY (relay), and UR (UPL resource) assignment types. RY and UR assignments must be made from AZedit.

1. Navigate to the **Key Assignments menu item** (Setup | Key Assignments).
 2. Press the **SEL/MENU button**.
 3. Press one of the **A - D buttons** to select the key to modify.
OR
Rotate **either shaft encoder** to navigate to the desired talk key.
-

Notice!

You only need to press SEL/MENU if you use the shaft encoder to select the key. If you press A-D to select the key, it enters the edit mode directly.

4. Press the **SEL/MENU button**.
The talk key LED turns red and the display shows the talk key as scrollable.
 5. Rotate **either shaft encoder** to scroll through the available assignments.
If the current assignment is a RY or UR, the scroll list only consists of the current assignment and the NULL assignment (the alpha for the NULL assignment is ----).
-

Notice!

To remove an assignment from a key, assign NULL to the key.

6. Press the **SEL/MENU button** to confirm the selection.

To **configure talk key assignments in keypanel mode**, do the following:

1. Navigate to the **Key Assignments menu item** (Setup | Key Assignments).
 2. Press the **SEL/MENU button**.
The talk key LED turns red and the display shows the talk key as scrollable.
-

Notice!

You only need to press SEL/MENU if you use the shaft encoder to select the key. If you press A-D to select the key, it enters the edit mode directly.

3. Press one of the **A - D buttons** to select the key to modify.
OR
Rotate **either shaft encoder** to navigate to the desired talk key.
4. Press the **SEL/MENU button**.
The talk key LED turns red and the display shows the talk key as scrollable and the adjacent LED for the adjacent (showing the function type) key turns white.
5. Rotate either **shaft encoder** to scroll through the available assignments.
6. Press the **SEL/MENU button** to confirm the selection.

Notice!

To remove an assignment from a key, assign NULL to the key.

To **change the assignment type of a key in keypad mode**, do the following:

1. While changing the assignment of a key, press and hold the **assignment type key**.
This moves the scroll highlight to the assignment type. The talk key LED for the assignment type turns red (from white) and the talk key LED for the current assignment (the key being modified) turns white (from red).
 2. Rotate either **shaft encoder** to scroll through a list of available assignment types.
- The assignment type changes and a new scrollable list of assignments appears on the talk key button previously selected. If you have not accessed the scroll list for this assignment type before, the DBP asks the intercom for it, and a wait prompt displays until DBP receives the scroll list. If there are no scrollable items available for the selected function type, only the current assignment type and NULL are available.

7.1.1.1**Change the setup page**

Setup Pages allow access to more key assignments than physical keys on the device. This is useful when sharing devices because users can change the setup page to show the key assignments they need.

The device allows up to 15 setup pages per keypad port.

The current active page displays in green text and the inactive pages display in blue text.

To **change setup pages**, do the following:

1. Navigate to the **Key Assignments menu item**.
2. Press the **SEL/MENU button**.
3. Press the **CALL button**.

The Select Setup popup spinner box appears.



4. Rotate either **shaft encoder** to scroll the available options.
5. Press the **SEL/MENU button** to confirm the change, or press the **CLR/BACK button** to abort changes.

7.1.2

Key mode

Use the **Key Modes** menu item to configure the behavior of the talk buttons.

Available options

Latching - Tap the talk key on, and then tap the talk key off. However, if you press and hold, the talk key turns on, but then turns off when you let the key go.

Momentary - The talk key is active as long as it is pressed.

Always on - The talk key is always on.

Always off - The talk key is always off.

To **configure the talk key modes**, do the following:

1. Navigate to the **Key Mode menu** (Setup | Key Modes).
2. Navigate to select the **talk key** to configure.
3. Press the **SEL/MENU button**.

The field becomes active.



4. Rotate either **shaft encoder** to scroll the available options.
5. Press the **SEL/MENU button** to confirm the change, or press the **CLR/BACK button** to abort changes.

7.1.3

Key backlight

7.1.4

Flashlight

7.1.4.1

Flashlight on/off

To use the flashlight, you must first enable the flashlight feature.

- 1.

7.1.4.2	Color
7.1.4.3	Brightness
7.1.4.4	Timeout
7.1.5	Alerts
7.1.5.1	Volume
7.1.5.2	Call beep
7.1.5.3	Call vibrate
7.1.5.4	Groups
7.1.6	Display

7.1.6.1 Mode

Use the **Display Mode** menu item to select a predefined display brightness. There are three modes from which to choose.
The default brightness settings for each mode are:

Normal	76% brightness
Dim	26% brightness
Dark	0% brightness

Modifications to these defaults are done in the Brightness menu.

- To **set the display mode**, do the following
1. Navigate to the **Display Mode menu item** (Display | Display Mode).
 2. Press the **SEL/MENU button**.
The field becomes active.



3. Rotate either **shaft encoder** to scroll the available options.

Notice!

As you switch between the different modes, the Brightness bar graph changes to show the brightness level for that mode. You can edit the brightness of the mode by selecting the mode and then modifying the brightness of the selected mode in the Brightness menu item.

4. Press the **SEL/MENU button** to confirm the change, or press the **CLR/BACK button** to abort changes.

7.1.6.2**Brightness**

Use the **Brightness** menu item to adjust the brightness for the currently selected display mode. Adjustments to the brightness appear in increments of two, from 0% to 100%.

To **set the brightness**, do the following:

1. Navigate to the **Brightness menu item** (Display | Brightness).
2. Press the **SEL/MENU button**.

The field becomes active.



3. Rotate either **shaft encoder** to increase or decrease the display brightness.
4. Press the **SEL/MENU button** to confirm the change, or press the **CLR/BACK button** to abort changes.

7.1.6.3**Screen saver**

Use the **Screen Saver** menu item to configure the amount of time before the screen saver activates. You can download your own screen saver image via AZedit. The minimum image size is 16x16 pixels; the maximum size cannot exceed 120x120 pixels. For more information on downloading an image, see Download screen saver images or splash screen images.

The DBP contains a default screen saver of the RTS logo.

Available options: *Disabled, 5 Minutes, 10 Minutes, 20 Minutes, 30 Minutes, 1 Hour, 2 Hours, 4 Hours, 6 Hours, 8 Hours, 10 Hours, and 12 Hours.*

To **configure the screen saver**, do the following:

1. Navigate to the **Screen Saver menu item** (Display | Screen Saver).
2. Press the **SEL/MENU button**.

The field becomes active.



3. Rotate either **shaft encoder** to scroll through the options.
4. Press the **SEL/MENU button** to confirm the change, or press the **CLR/BACK button** to abort changes.

7.1.6.4 Dark mode delay

7.1.6.5 Language

7.1.6.6 Screen flip

Use the **Screen Flip** menu item to set the orientation of the display screen.

Notice!

The correspondence of the navigation buttons and shaft encoders remain unchanged after the initiation of a screen flip. In addition, key assignments remain associated with the original A, B, C, and D keys, independent of screen orientation.

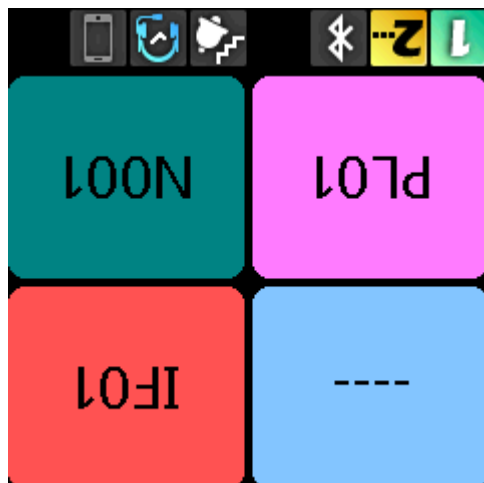
To **use screen flip**, do the following:

1. Navigate to the **Screen Flip menu item** (Display | Screen Flip).
2. Press the **SEL/MENU button**.

The field becomes active.



3. Rotate either **shaft encoder** to enable screen flip.
The screen display flips.



4. Press the **SEL/MENU button** to confirm the change, or press the **CLR/BACK button** to abort changes.

7.1.6.7 Show banner

7.1.6.8 Banner colors

7.2 Audio menu

7.2.1 Headset

7.2.1.1 Mode

7.2.1.2 Auto-transfer

7.2.1.3 Echo canceller

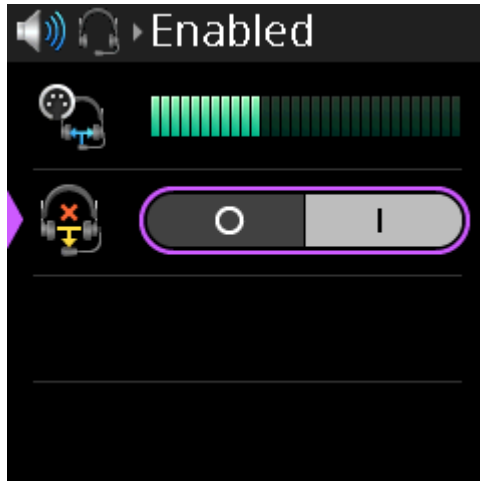
Use the **Echo Canceller** menu item to enable echo cancellation for the headset. Echo cancellation prevents feedback from occurring between the microphone and the speaker being used on the beltpack. If an echo is still present after being enabled, it is possible the echo is originating from another user on the network.

This feature is not available when the Bluetooth headset is selected as the active microphone.

To **enable Echo Cancellation**, do the following:

1. Navigate to the **Echo Canceller menu item** (Audio | Headset | Echo Canceller).
2. Press the **SEL/MENU button**.

The field becomes active.



3. Rotate either **shaft encoder** to toggle between choices.
4. Press the **SEL/MENU button** to confirm the change, or press the **CLR/BACK button** to abort changes.

7.2.1.4 Speaker dim

7.2.1.5 Sidetone level

Use the **Sidetone** menu item to configure the level, in dB, at which the user hears their own voice.

Most people prefer some amount of sidetone to overcome the muffled sensation when talking, especially when wearing a dual-sided headset. There are three different sidetone values available for editing from this menu; XLR Sidetone, 3.5mm Sidetone, and Bluetooth Sidetone. Only one displays at a time, but the context changes depending upon the active mic selection.

The range for this field is Disabled, -30 dB to 0 dB

The default setting is -20 dB

To **set the sidetone**, do the following:

1. Navigate to the **Sidetone menu item** (Audio | Headset | Sidetone).
2. Press the **SEL/MENU button**.

The field becomes active.



3. Rotate either **shaft encoder** to adjust the level.
4. Press the **SEL/MENU button** to confirm the change, or press the **CLR/BACK button** to abort changes.

7.2.1.6	Max volume
7.2.1.7	Min volume
7.2.1.8	Speaker mode
7.2.2	Microphone menu
7.2.2.1	Mic select
7.2.2.2	Mic gain
7.2.2.3	Noise gate
7.2.2.4	Mic compression
7.2.2.5	Hot mic
7.2.2.6	Allow mic kill
7.2.2.7	Send mic kill
7.2.2.8	XLR mic type
7.2.3	Advanced DSP (diagnostic service processing)
7.2.3.1	Mic AGC (auto gain control) level
7.2.3.2	Noise reduction
7.2.4	Mixer
7.2.5	Bluetooth
7.2.5.1	Input gain
7.2.5.2	Output gain
7.2.6	3.2mm Aux
7.2.6.1	Aux mode
7.2.6.2	Input gain
7.2.6.3	Output gain
7.2.6.4	Aux stereo mix
7.3	Setup menu

7.3.1 BP registration

7.3.1.1 Available APs

7.3.1.2 Connected APs

7.3.1.3 Enable AP registration

7.3.2 DECT

7.3.2.1 Name

7.3.2.2 Multiple registration

7.3.2.3 Zone select

7.3.2.4 Tx power

7.3.3 Service

7.3.3.1 Tone

Use the **Tone** menu item to enable or disable the 500Hz tone generator. The tone generator transmits a 500Hz tone from the beltpack

To **enable/disable tone**, do the following:

1. Navigate to the **Tone menu item** (Setup | Service | Tone).
2. Press the **SEL/MENU button**.

The field becomes active.

1. Rotate either **shaft encoder** to toggle between choices.
2. Press the **SEL/MENU button** to confirm the change, or press the **CLR/BACK button** to abort changes.

7.3.3.2 User reset

Use the **User Reset** menu item to reset the device configurations.

To **perform a user reset**, do the following:

1. Navigate to the **User Reset menu item** (Setup | Service | User Reset).

1. Press the **SEL/MENU button**.

A popup message appears to confirm the reset.

1. Press and hold the **SEL/MENU button for 3 seconds**.

A three-second countdown screen appears and then the configuration resets. The unit does not reboot after a User Reset.

7.3.3.3

Factory reset

Use the **Factory Reset** menu item to set the device back to its original factory settings. The factory reset differs from a user reset in that the factory reset deletes all paired Bluetooth devices, any user splash screen or screen saver, any selected offers/partners, and restores the original factory network settings, which includes the device name.

To **perform a factory reset**, do the following:

1. Navigate to the **Factory Reset menu item** (Setup | Service | Factory Reset).
1. Press the **SEL/MENU button**.
The Factory Reset confirmation message appears.
1. Press and hold the **SEL/MENU button for three seconds**.
A three-second countdown message appears and then the belt pack performs a factory reset and then reboots.

7.3.3.4

Test mode

Use the **Test Mode** menu item to check the operation of all keys and displays on the belt pack.

To **enter test mode**, do the following:

1. Navigate to the **Test Mode menu item** (Setup | Service | Test Mode).
1. Press the **SEL/MENU button**.
The Test Mode screen displays.
1. Press **each A through D key, CLR/BACK, CALL, and SEL/MENU buttons** to check operation.
The A through D letters light in white and then in red, each time you press the button, and the corresponding LEDs on the physical buttons light in the same color. The icons on the CLR/BACK, CALL, and SEL/MENU keys light white when pressed and the corresponding LEDs on the physical buttons light as well.
2. Press the **shaft encoders** and turn the **shaft encoders**.
The shaft encoder buttons light in magenta when pushed and blue directional arrows appear to indicate the rotational direction when rotating the shaft encoders.

To **exit test mode**, do the following:

- ▶ Press and hold the **CLR/BACK button**.
After 3 seconds, test mode is closed.

8 Technical data

8.1 TR-1000

General

	TR-1000 Beltpack
Audio	BV32 wideband audio
Bandwidth (over DECT)	20 Hz - 7.5 kHz
Backlit display	Color, 240 x 240 pixel, TFT
Removable battery pack	Li-Ion pack, 3.7 VDC, 6840 mAh
Typical battery life	18 hours
Wireless encryption	AES256

Environmental

	TR-1000 Beltpack
Operating temperature (°F)	14 °F - 104 °F
Operating temperature (°C)	-10 °C - 40 °C
Storage temperature (°F)	-4 °F - 140 °F
Storage temperature (°C)	-20 °C - 70 °C
Dimensions (H x W x D) (in)	5.63 in x 3.90 in x 2.17 in
Dimensions (H x W x D) (mm)	143 mm x 99 mm x 55 mm
Weight (lb)	1.23 lb
Weight (kg)	0.56 kg
Ingress protection (IP)	IP-65

Controls

	TR-1000 Beltpack
Level controls	Two rotary encoders
Talk/Listen control	4 top panel talk buttons (listen function programmable)
Full-Duplex audio paths	Up to 16
Number of assignment pages	4
Call waiting control	Reply and Clear functionality
Main menu sub-menus	Beltpack, Audio, Favorites, Setup, Pre-sets, Status

Connections

	TR-1000 Beltpack
Headset connectivity	XLR-5F, XLR-4F, XLR-4M (User replaceable) 3.5mm
XLR	
Microphone	Dynamic or Electret (auto-detect)
Headset impedance	150 Ω nominal (32 Ω - 600 Ω)
3.5mm	
Microphone	Electret only
Headset impedance	32 Ω - 600 Ω
Aux in	1 Vrms (nominal), 20 Hz - 20 kHz (+0/-1 dB)
Aux out	1 Vrms (nominal), DECT: 20 Hz - 7.5 kHz
USB-C	
In-beltpack charging jack	Yes
Firmware update jack	Yes
Lanyard	Integrated lanyard clip connection points

Internal Microphone

	TR-1000 Beltpack
Type	Embedded
Typical input	80 dBSPL
Max. input	100 dBSPL
Bandwidth	20 Hz - 20 kHz (+0/-3 dB) 20 Hz - 5 kHz (+0/-1 dB)

Internal Speaker

	TR-1000 Beltpack
Nominal output	84 dBSPL (1 kHz @ ½ meter)
Max. output	94 dBSPL (1 kHz @ ½ meter)
Frequency range	350 Hz - 6 kHz (+0/-3 dB)

DECT Communications

	TR-1000 Beltpack
RF frequency range (MHz)	1,920 MHz - 1,930 MHz (US, Canada) 1,880 MHz - 1,900 MHz (EU = Europe, Asia, Australia) 1,894 MHz - 1,906 MHz (Japan) 1,910 MHz - 1,930 MHz (Mexico, South America)
Communication protocol	DECT
Frequency selection	Automatic via DCS (Dynamic Channel Selection)
Modulation	DBPSK
Antennas DECT	Dual, internal inverted F antennas
Delay-spread and multi-path RF protection	Next generation DECT channel compensation
Maximum peak RF output power (mW)	100 mW (20 dBm) (US, Canada, Malaysia) 250 mW (24 dBm) (Europe, Mexico, South America, Japan)
Average power (US, Canada, Malaysia)	4 mW
Average power (Europe, Mexico, South America, Japan)	10 mW

Bluetooth Low Energy Communications

	TR-1000 Beltpack
BLE 5.3 frequency range	2400 - 2483.5 MHz
Communication protocol	BLE 5.3
Modulation	GFSK
Antenna	Internal ¼-wave
Maximum output power	1 mW

8.2**AP-1000****General**

	AP-1000 Access Point
Audio	BV32 wideband audio
Max. beltacks per AP-1000	Up to 10
Max. access points in a system	120
Ethernet type	100BASE-T or GigE
Protocols / standards	OMNEO ST-2110/ST2022-7 DECT

	AP-1000 Access Point
Ethernet cabling required	UTP CAT-5e or better
Input voltage (VDC)	
DC Power supply	+12 VDC, 4-pin XLR input (optional)
DC Battery	14.2 VDC, Anton Bauer, via 4-pin XLR input (optional)
PoE	Class 3 device (compatible with PoE, PoE+, or PoE++)
Power consumption	8.5 W, typical
LED indicators	4 (power, fault, connectivity, location)

Environmental

	AP-1000 Access point
Operating temperature (°F)	-4 °F – 131 °F
Operating temperature (°C)	-20 °C – 45 °C
Storage temperature (°F)	-4 °F – 158 °F
Storage temperature (°C)	-20 °C – 70 °C
Dimensions (H x W x D) (in)	9.02 x 7.60 x 3.00 (with bracket) 9.02 x 7.60 x 2.64 (w/out bracket)
Dimensions (H x W x D) (mm)	229 x 194 x 76 (with bracket) 229 x 194 x 67 (w/out bracket)
Weight (lb)	4.72 (with bracket) 4.14 (w/out bracket)
Weight (kg)	2.14 (with bracket) 1.88 (w/out bracket)
Ingress Protection (IP)	IP-65

Connections

	AP-1000 Access Point
Ethernet connectors	2 x EtherCon RJ-45 jacks
Power connector	1 x 4-pin XLR-F Jack (accepts power supply or battery supply)
Optical connector	2 x SFP
GPO connector	2 x GPO relay ports

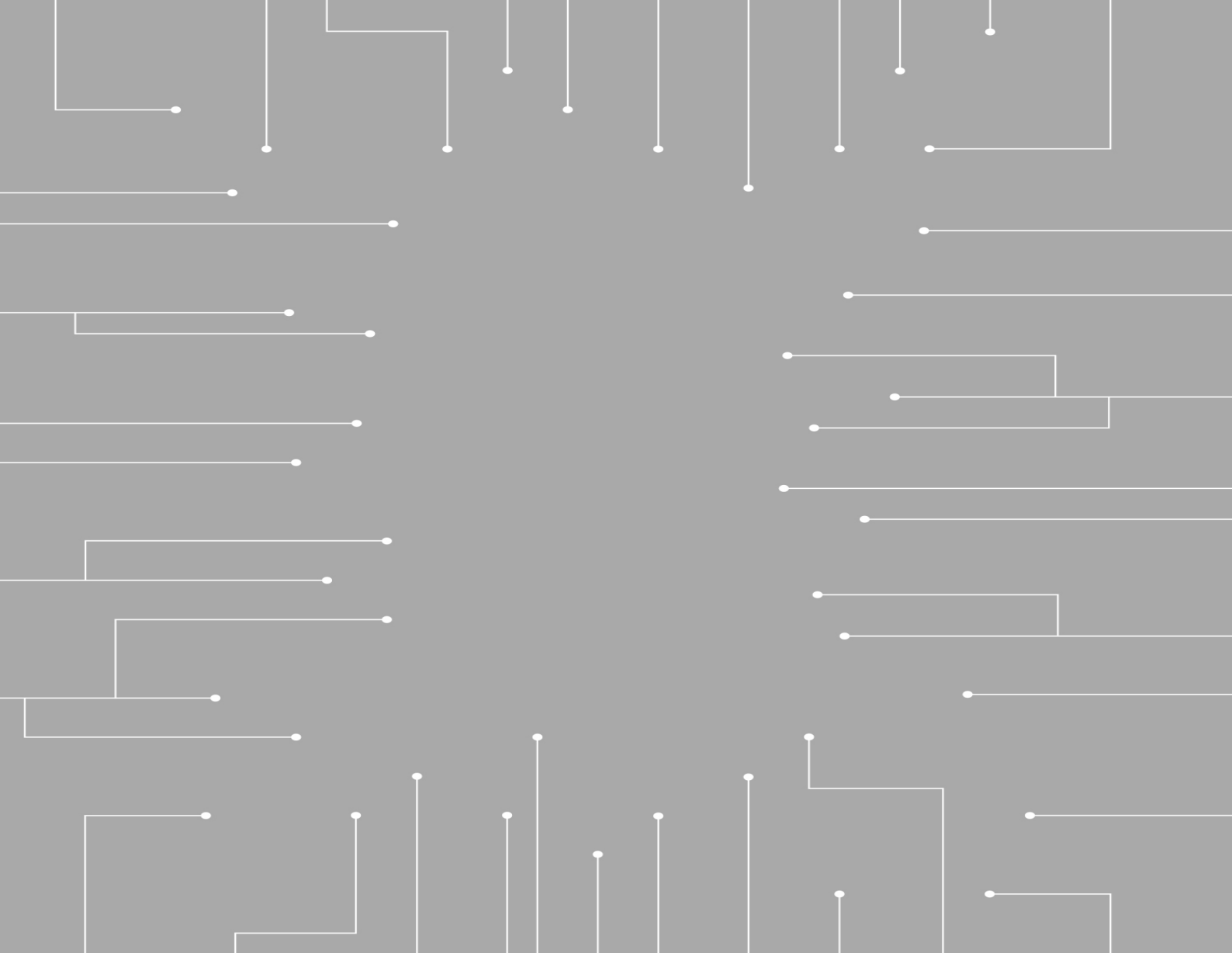
DECT Communications

	AP-1000 Access Point
RF frequency range (MHz)	1,920 MHz - 1,930 MHz (US, Canada) 1,880 MHz - 1,900 MHz (EU = Europe, Asia, Australia) 1,894 MHz - 1,906 MHz (Japan) 1,910 MHz - 1,930 MHz (Mexico, South America)
Frequency selection	Automatic via DCS (Dynamic Channel Selection)
Modulation	DBPSK
Antennas	Dual, internal dipole antennas
High Difficulty DECT RF environments	Next generation DECT channel compensation
Maximum peak RF output power (mW) (dBm)	100 mW (20 dBm) (US, Canada, Malaysia) 250 mW (24 dBm)(Europe, Mexico, South America, Japan)
Average power (US, Canada, Malaysia) (dependent on the number of belt packs)	4 mW - 42 mW
Average power (Europe, Mexico, South America, Japan) (dependent on the number of belt packs)	10 mW - 105 mW

Bluetooth Low Energy Communications

	AP-1000 Access Point
BLE frequency range	2400 - 2483.5 MHz
Communication protocol	BLE 5.3 (Bluetooth Low Energy)
Modulation	GFSK
Antenna	Internal ¼-wave
Maximum output power	1 mW

9 Appendices



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