



# AIRSPEED 1900 F495

## INSTALLATION GUIDE

5G-NR Outdoor gNB

Installation Guide

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## Document Information

This document details procedures for installing the Airspan's AirSpeed 1900 gNB 5G-NR Outdoor unit. AirSpeed 1900 is a compact, easy-to-deploy gNB, for pole and wall installation.

This document is intended for qualified personnel with a working knowledge of 5G.

## Revision History

| Revision | Date     | Summary of Changes                                                                                                                                             | Created by |
|----------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Rev 1.0  | Feb 2024 | <ul style="list-style-type: none"><li>Initial document – draft</li></ul>                                                                                       | CY         |
| Rev A1.1 | Mar 2024 | <ul style="list-style-type: none"><li>Updated Section 3</li></ul>                                                                                              | NS         |
| Rev A1.2 | May 2024 | <ul style="list-style-type: none"><li>Added DC-grounded antenna information in the <a href="#">External Antenna Assembly</a> section</li></ul>                 | NS         |
| Rev A2.0 | Aug 2024 | Fixed errors in accessory kit definition and pole diameter supported by U-Bracket and bands<br>Change the antenna DC grounding to preference but not mandatory | STS        |
| Rev A2.1 | Oct 2024 | Update safe distance to 14cm (0.45 ft.)                                                                                                                        | STS        |

## Warnings and Cautions

### Human Exposure to Radio Frequencies

The AirSpeed 1900 gNB 5G unit should be operated from a minimum safe distance of 14 (0.45 ft.)

### Radio Interference

The AirSpeed 1900 generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment on and off, the technician is encouraged to try to correct the interference by performing one or more of the following measures:

- Re-orientate or relocate the unit
- Increase separation between the units and/or End Devices
- Connect the equipment to a circuit different from that to which the power source is connected

### Modifications

Any changes and modifications to this device that are not expressly approved by Airspan Networks may void the user's authority to operate the equipment.

## General

- Only qualified personnel should be allowed to install, replace, and service the equipment.
- The device cannot be sold retail, to the general public or by mail order. It must be sold to operators.
- Installation must be controlled.
- Installation must be performed by licensed professionals.
- Installation requires special training. The AirSpeed 1900 should be installed **ONLY** by experienced installation professionals who are familiar with local building and safety codes and, wherever applicable, are licensed by the appropriate government regulatory authorities. Failure to do so may void Airspan's product warranty and may expose the end user or the service provider to legal and financial liabilities. Airspan and its resellers or distributors are not liable for injury, damage, or violation of regulations associated with the installation of outdoor units or antennas.
- The device is to be installed in a Restricted Access Location.
- Surge Arrestors and Transient Voltage Surge Suppressors installed external to the ITE are required to comply with the appropriate CEC/NEC requirements.
- Equipment connected to the PoE port must have its own fire enclosure.

## Important Safety Instructions

- Read and save these instructions.
- This Installation Guide contains instructions and warnings that should be followed during installation, and operation.
- Failure to follow these instructions could cause bodily injury and/or product failure.

## Safety

1. Read this guide and follow all operating and safety instructions.
2. The supply cord is not shipped with the unit and must be provided by the user. Installation is to be performed by a qualified electrician according to local codes. Installation is to be done in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, the Canadian Electrical Code (CEC), Part I, CAN/CSA C22.1, and when applicable, the National Electrical Safety Code, IEEE C2.
3. Static sensitive components inside - do not remove the lid or base: No user-serviceable parts inside.
4. The ground connection should be made before connecting to supply connections.
5. Position the power cord to avoid possible damage; do not overload circuits.
6. Do not place this product on or near a direct heat source and avoid placing objects on the terminal.
7. To avoid electrical shock do not install this device during adverse conditions such as rain or inclement weather.
8. Use only a damp cloth for cleaning. Do not use liquid or aerosol cleaners. Disconnect the power before cleaning.
9. The units should not be placed too close to any power lines or other electrical power circuits, as they can come into contact with such power lines or circuits.
10. The radio transceiver must be properly grounded to protect against power surges and accumulated static electricity. It is the user's responsibility to install this device in accordance with the local electrical codes.
11. Installation of the AirSpeed 1900 gNB must be contracted to a professional installer.
12. The circuit breaker should be easily accessible in case you have to disconnect the device.
13. When installed in the final configuration, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.

## Warning of Hazardous Voltages

On AC installations, hazardous voltages exist. Use caution when verifying or working with AC power. Remove metal jewelry that could come into contact with AC power.

On DC sections, short-circuiting the low voltage, low impedance circuits can cause severe arcing that may result in burns or eye damage. Remove rings, watches, etc. to avoid shorting DC circuits.



Airspan products do not contain hazardous substances (as defined in the UK Control of Substances Hazardous to Health Regulations 1989 and the Dangerous Substances Regulations 1990). At the end of any Airspan product life cycle, the customer should consult with Airspan to ensure that the product is disposed of in conformance with the relevant regulatory requirements.

## Adherence to European Directive 2014/53/EU

European Council Recommendation 2014/53/EU details basic restrictions and reference levels on human exposure to electromagnetic fields as advised by the ICNIRP. Adherence to these

recommended restrictions and reference levels should provide a high level of protection as regards the established health effects that may result from exposure to electromagnetic fields.

## Warning Symbols

The following symbols may be encountered during installation or troubleshooting. These warning symbols mean danger. Bodily injury may result if you are not aware of the safety hazards involved in working with electrical equipment and radio transmitters. Familiarize yourself with standard safety practices before continuing.



## Service Information

Refer all repairs to qualified service personnel. Do not modify any part of this device, as this will void the warranty.

Disconnect the power to this product and return it for service if the following conditions apply:

1. The terminal does not function after following the operating instructions outlined in this manual.
2. The product has been dropped or the housing is damaged.

Locate the serial number of the terminal and record this on your registration card for future reference. Also record the MAC address, located on the product sticker.

## UL Information

- The equipment must be properly grounded according with NEC and other local safety code requirements.
- Reminder to all the BWA system installers: Attention to Section 820-40 of the NEC which provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as is practical.
- AirSpeed 1900 gNB is designed to operate in environmental conditions complying with IP65 and relevant standards.

## Lightning Protection



**WARNING: The following notes are general recommendations for the system.**

The wireless equipment should be installed by a qualified professional installer and must follow local and national codes for electrical grounding and safety. Failure to meet safety requirements and/or use of non-standard practices and procedures could result in personal injury and damage to equipment. A direct lightning strike may cause serious damage even if these guidelines are followed.

All outdoor wireless equipment is susceptible to lightning damage from a direct hit or induced current from a near strike. Lightning protection and grounding practices in local and national electrical codes serve to minimize equipment damage, service outages, and serious injury. Reasons for lightning damage are summarized as:

- Poorly grounded tower/antenna sites that can conduct high lightning strike energy into equipment.
- Lack of properly installed lightning protection equipment that can cause equipment failures from lightning induced currents.

A lightning protection system provides a means by which the energy may enter earth without passing through and damaging parts of a structure. A lightning protection system does not prevent lightning from striking; it provides a means for controlling it and preventing damage by providing a low resistance path for the discharge of energy to travel safely to ground. Improperly grounded connections are also a source of noise that can cause sensitive equipment to malfunction.

A good tower grounding system disperses most of the surge energy from a tower strike away from the building and equipment.

To limit the equipment damage due to a lightning strike, the following practices are recommended for the wireless system:

- Provide direct grounding from the antenna mounting bracket, the radio and antenna and the lightning/surge protectors to the same ground point at the base of the tower or a ground bus on the building. Use the grounding screws on the antenna bracket and the radio and antenna for terminating the ground wires.
- The AC wall outlet ground must be connected to the same grounding system as the eNodeB.

## Outdoor Ethernet Cabling

- Ethernet cable connected to should be outdoor grade with UV protection.
- Use shielded out CAT5e (minimum) cabled terminated with metallic RJ45 connectors.
- In order to protect any indoor units, install surge protection circuits on all copper cables at their entrance to the building.
- Surge protection circuit must use a minimum 16AWG grounding cable.

## DECLARATION OF CONFORMITY

Declaration of Conformity with regard to the R&TTE Directive 2014/53/EU

### Czech:

Airspan tímto prohlašuje, že tento přístroj je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 2014/53 / EU.

### Danish:

Undertegnede, Airspan erklærer hermed, at følgende udstyrsenhed opfylder de væsentlige krav og andre relevante krav i direktiv 2014/53 / EF.

**Deutsch:**

Hiermit erklärt Airspan, dass die Produkteinheit die grundlegenden Anforderungen und anderen relevanten Bestimmungen der Richtlinie 2014/53 / EU erfüllt.

**Estonian:**

Käesolevaga kinnitab Airspan, et seadme seade vastab direktiivi 2014/53 / EL oluliste nõuetele ja muudele kõnealuse direktiivi asjakohastele sätetele.

**English:**

This equipment is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.

**Español:**

Por medio de este Airspan, declara que la unidad cumple con los requisitos esenciales y cualquier otra disposición aplicable o exigible de la Directiva 2014/53 / UE.

**Greek:**

ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ ΠΡΟΔΙΑΓΡΑΦΗ, η Airspan ΔΗΛΩΝΕΤΑΙ ότι η μονάδα συμμορφώνεται με τις ουσιώδεις απαιτήσεις και τις λοιπές σχετικές διατάξεις της οδηγίας 2014/53 / ΕΕ.

**Français:**

Airspan déclare par la présente que l'appareil est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 2014/53 / UE.

**Italiano:**

Con la presente Airspan dichiara che questa unità è conforme ai requisiti essenziali e alle altre disposizioni pertinenti stabilite dalla direttiva 2014/53 / UE.

**Latvian:**

Ar šo Airspan paziņo, ka vienība atbilst Direktīvas 2014/53 / ES būtiskajām prasībām un citiem attiecīgajiem noteikumiem;

**Lithuanian:**

Šis „Airspan“ pareiškia, kad šis įrenginys atitinka esminius Direktyvos 2014/53 / ES reikalavimus ir kitas nuostatas.

**Nederlands:**

Airspan verklaart hierbij dat de apparaateenheid voldoet aan de essentiële vereisten en andere relevante bepalingen van richtlijn 2014/53 / EU.

**Maltese:**

Hawnhekk, Airspan, tiddikjara li din l-unità tikkonforma mar-rekwiziti essenzjali u dispozizzjonijiet rilevanti oħra li jinsabu fid-Direttiva 2014/53 / UE.

**Hungarian:**

Alulírott, az Airspan kijelenti, hogy az egység megfelel a 2014/53 / EU irányelv vonatkozó alapvető követelményeinek és egyéb követelményeinek.

**Polish:**

Niniejszym Airspan oświadcza, że urządzenie jest zgodne z zasadniczymi wymaganiami i innymi odpowiednimi postanowieniami dyrektywy 2014/53 / UE.

**Português:**

Airspan declara que esta unidade está em conformidade com os requisitos essenciais e outras disposições da Diretiva 2014/53 / UE.

**Slovenian:**

Airspan izjavlja, da je ta enota skladna z bistvenimi zahtevami in drugimi ustreznimi določbami Direktive 2014/53 / EU.

**Slovak:**

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**Suomalainen:**

Airspan vakuuttaa täten, että laitteen tyyppi on direktiivin 2014/53 / EU olennaisten vaatimusten ja muiden asiaankuuluvien säännösten mukainen.

**Swedish:**

Därmed intygar Airspan att denna enhet överensstämmer med de väsentliga egenskapskraven och andra relevanta bestämmelser som anges i direktiv 2014/53 / EU.

**Íslenska:**

Airspan lýsir hér með yfir að þessi eining uppfylli grunnkröfur og aðrar kröfur tilskipunar 2014/53 / ESB.

**Norsk:**

Airspan erklærer herved at utstyrsenheden oppfyller grunnleggende krav og andre relevante krav i direktiv 2014/53 / EU.

**Român:**

Airspan declarăm pe propria răspundere că produsul produsului respectă cerințele esențiale și alte prevederi aplicabile din Directiva 2014/53 / UE.

The Declaration of Conformity related to this product can be obtained from [PLM@Airspan.com](mailto:PLM@Airspan.com).

## GPS Compliance

The GPS complies with the essential requirements and other relevant provisions of Directive 2014/53/EU."

The GPS complies with the following EMC Common Regulatory Testing standards:

- EN55022: Radiated and Conducted Emissions
- CISPR 22: Class B
- EN 50081-1: Generic Emissions Class B
- EN 50082-1: Generic Immunity Class B
- EN 61000-4-2: Electrostatic Discharge Immunity
- EN 61000-4-3: Radiated RF EM-Field Immunity Test
- EN 61000-4-4: Electrical Fast Transient/Burst Test
- EN 61000-4-6: Conducted Immunity
- EN 61000-4-8: Magnetic Field Immunity



A GPS is recommended for synchronizing the unit.



An optional GPS Lightning/Surge protector is available from Airspan when installing the GPS antenna in a remote location for lightning-prone deployments.

## Maximum Output TX Total Power

Table 1: AirSpeed 1900 gNB Maximum Output TX Total Power

| Frequency Band (MHz) | TX Power                                          | Antenna Gain |
|----------------------|---------------------------------------------------|--------------|
| n79 (4940-4990)      | 2x29dBm for 40MHz,<br>20MHz<br>2x27 dBm for 10MHz | Up to 19dBi  |



Do not set maximum output TX power to higher than local regulations.

## Voltage and Amperage

Table 2: Voltage & Amperage Draws

| Power Source             | Power Consumption (W) |
|--------------------------|-----------------------|
| -48D DC (-40.5V to -57V) | >90                   |

## Antenna System

The AirSpeed 1900 supports the following antenna options: External antenna – 2 ports for external antenna option. See,

[External Antenna](#) Assembly

## About this Document

### Purpose

This guide provides the workflow and step-by-step procedures for installing Airspan's AirSpeed 1900 gNB 5G Outdoor. These procedures include:

- Verify prerequisites
- Install tilt bracket & Pole/Wall bracket
- Install the AirSpeed 1900
- Connect and manage cables

### Intended Audience

This guide is intended for the person who installs the AirSpeed 1900 equipment.

### Document Conventions

This document uses the following typographic conventions.

Table 3: Typographic Conventions

| Convention                                                                                                  | Element                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">Blue</a> underlined text                                                                        | Cross-reference links.                                                                                                              |
| <b>Bold text</b>                                                                                            | Keyboard buttons and GUI elements.                                                                                                  |
| Command                                                                                                     | Command names or phrases.                                                                                                           |
| Computer output                                                                                             | Text displayed by the computer.                                                                                                     |
| <a href="#">Hyperlinks</a>                                                                                  | Website and e-mail addresses.                                                                                                       |
| <b><a href="#">Danger</a></b>                                                                               | Signifies a hazardous situation—if not avoided—will cause death or serious injury. Describes how to avoid it.                       |
|  <b>Warning</b>          | Signifies a hazardous situation—if not avoided—can cause death or serious personal injury. Describes how to avoid it.               |
|  <b>Caution</b>          | Signifies a hazardous situation—if not avoided—can void the product warranty, and cause property damage. Describes how to avoid it. |
|  <b>Information/Note</b> | Provides necessary information to explain a task.                                                                                   |
|  <b>Tip</b>              | Provides helpful hints.                                                                                                             |

## Related Reading

The following documents contain related information:

- AirSpeed 1900 gNB 5G Product Specification
- Airspan 5G Commissioning Manual (pending)

## Customer Care Help Desk

Airspan's *Customer Care Help Desk* offers prompt and efficient customer support services.



To avail Airspan's *Customer Care Help Desk* support, you must be a registered user and must have a valid support contract. To register, click [here](#) and fill the Registration form.

To create and update issue logs, send e-mails to the [Customer Care Help Desk](#). Once you submit your issue, the system generates a new issue and sends an issue number for your reference. The system uses this issue number to categorize and store e-mails under the appropriate issue.

To help the *Customer Care Help Desk* identify your issue, include the issue number and your *Customer Care Helpdesk* account details in all further communications.

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## Airspan Encourages Comments

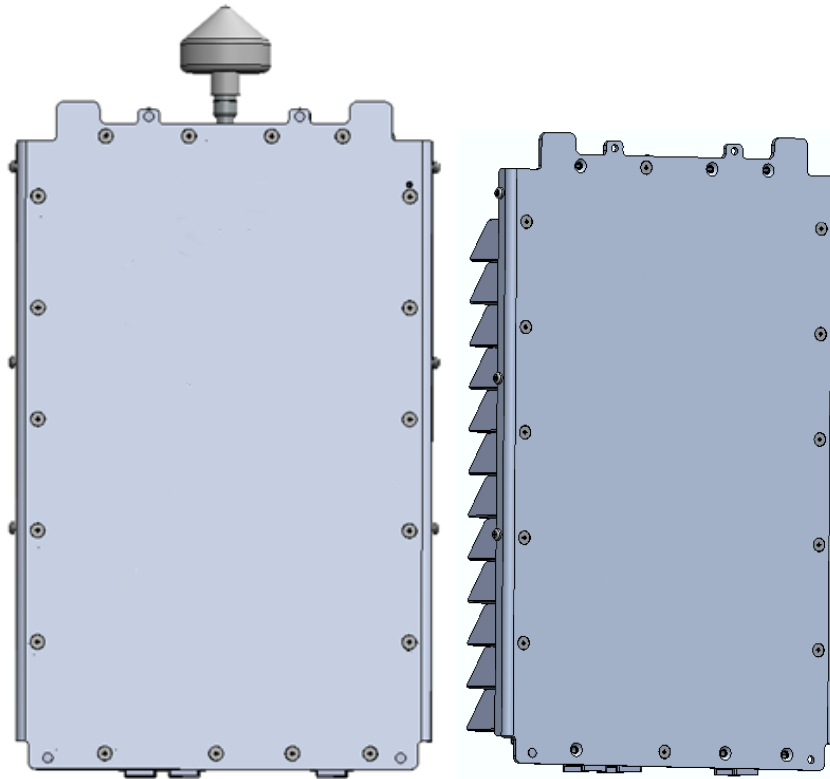
Airspan welcomes any feedback and suggestions that help to improve the quality of the documentation. Send your feedback to [documentfeedback@airspan.com](mailto:documentfeedback@airspan.com).

# 1 Getting Started

## 1.1 AirSpeed 1900 Installation Checklist

Plan the installation of the AirSpeed 1900 by using the Installation Checklist, which you can find as a removable job aid in [Appendix A](#) for this guide.

Figure 1: AirSpeed 1900 with GPS Attached



## 2 Verifying Prerequisites

Prior to installing the AirSpeed 1900 gNB 5G, verify the required safety, power, tools, parts, and components. This chapter includes the hardware, software, and client requirements for installation.

### 2.1 Verifying Site Requirements

Determine the location, access, and technique for installing the AirSpeed unit.

### 2.2 Verify Installation Requirements

#### 2.2.1 Verify the Tools

Table 4. Minimum Hardware Requirements

| Tool                       | Use                                                                                |
|----------------------------|------------------------------------------------------------------------------------|
| 10 mm or 13/32 inch wrench | For securing the M6x16 Hex bolts to assemble the tilt bracket to the AirSpeed back |
| 7/16 inch wrench           | For securing the tilt bracket to the Pole bracket with the 1/4-20 bolts            |
| 1/2 inch wrench            | For securing the 5/16-18 threaded rods                                             |



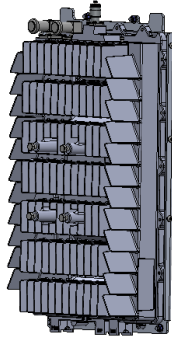
Airspan does not provide screws and wall anchors for mounting the unit to the wall. The screw size depends on the structure of the building to which the unit is to be attached. When selecting screw sizes, consideration must be given to the weight of the unit and load that may be induced in windy conditions.

2.2.2 Unit Parts



Verify order and requirements to ensure the correct unit type is being installed.

Table 5. Unit Parts

| Unit Parts                            | Product Code      | Items Included                                                                                | Images                                                                               |
|---------------------------------------|-------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| AirSpeed 1900, (n79)<br>4.94-4.99 GHz | AS19-CN-F495-DSC1 | AirSpeed 1900, connectorized, DC                                                              |   |
| Octis power connector (-48V DC)       | CON-OCT-DC-PWR-1R | Connector for DC power<br>Included with the unit, but can also be ordered separately as spare |  |

2.2.2.1 Accessory Kit

Accessory kit includes the following items (see full details in the table below):

- Wall and pole mounting kit
- GPS Antenna
- SFP Connector adapter
- RJ45 Connector adapter

Items can be ordered separately if only part of them are required or as spare.

Table 6. Accessory Kit

| Accessory Kit Product Code | Accessory Kit parts Product Codes | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Images                                                                                |
|----------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>AS-ACC-KIT-1</b>        | AS103-U-PMK-2                     | <p>AirSpeed 1900/2900 wall and pole mounting kit.<br/>Pole diameter 50-150 mm (2.6 to 5.9 inch) is handled with the U-Bracket and 150-250mm (5.9-9.8 inch) with the bands.<br/>Including:</p> <ul style="list-style-type: none"> <li>Mount bracket Base kit, including: <ul style="list-style-type: none"> <li>Pole/wall mounting bracket</li> <li>Tilt bracket</li> </ul> </li> <li>U-Bracket kit for 50-150mm pole diameter installation.<br/>Including: <ul style="list-style-type: none"> <li>2x clinch brackets</li> <li>4x 5/16-18 threaded rod(s)</li> <li>Nuts, spring washer(s) &amp; Flat washers</li> </ul> </li> <li>Bands: 2x Maxi Clamps, band 9/16" wide + quick adjustment lock (for poles 150-250 mm)</li> </ul> |   |
|                            | CON-ADP-OCT-SFP-1R                | Octis SFP Connector Adapter Reverse                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
|                            | CON-ADP-OCT-RJ45-1R               | Octis RJ45 Connector Adapter Reverse                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |

## 2.2.3 Power Source

AirSpeed 1900 supports direct connection to -48VDC power source:

- Operational Voltage Range: -40.5V to -57V DC

## 2.2.4 Connections

The following diagrams display the connections on the top and bottom panels of the AirSpeed 1900.



The unit requires a secure ground connection and a grounding screw fitted with a flat washer and a lock washer is provided on the back and clearly marked with the universal ground symbol.

Figure 2: AirSpeed 1900 Top Ports (Without an Integrated Antenna)

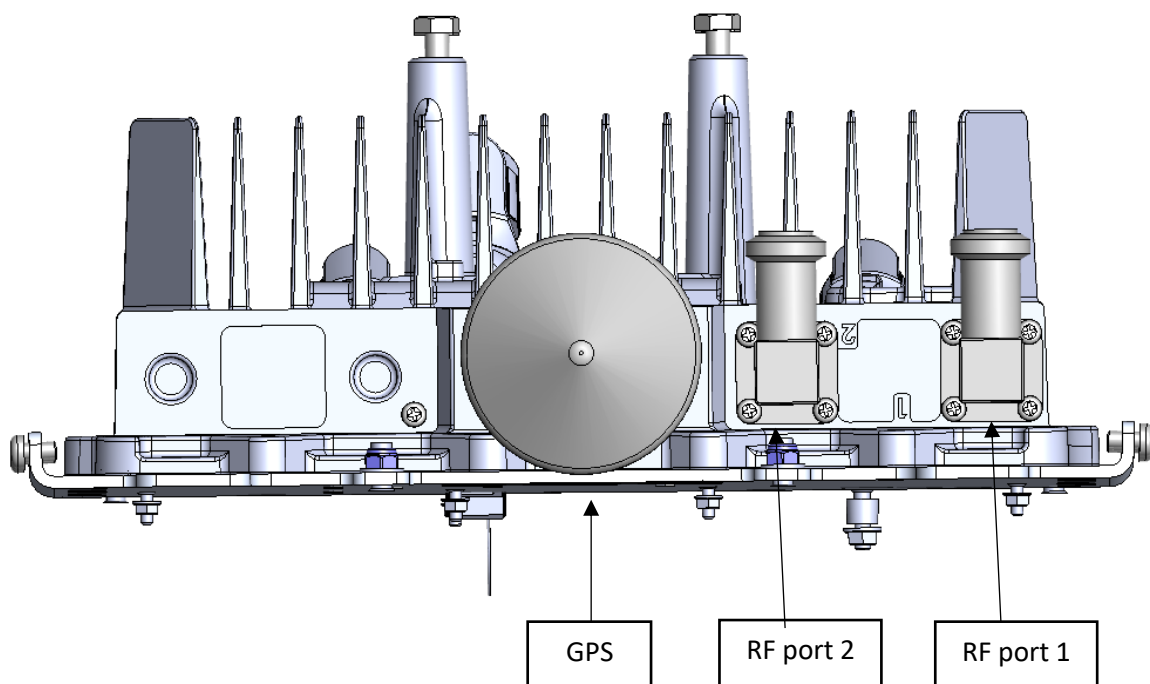
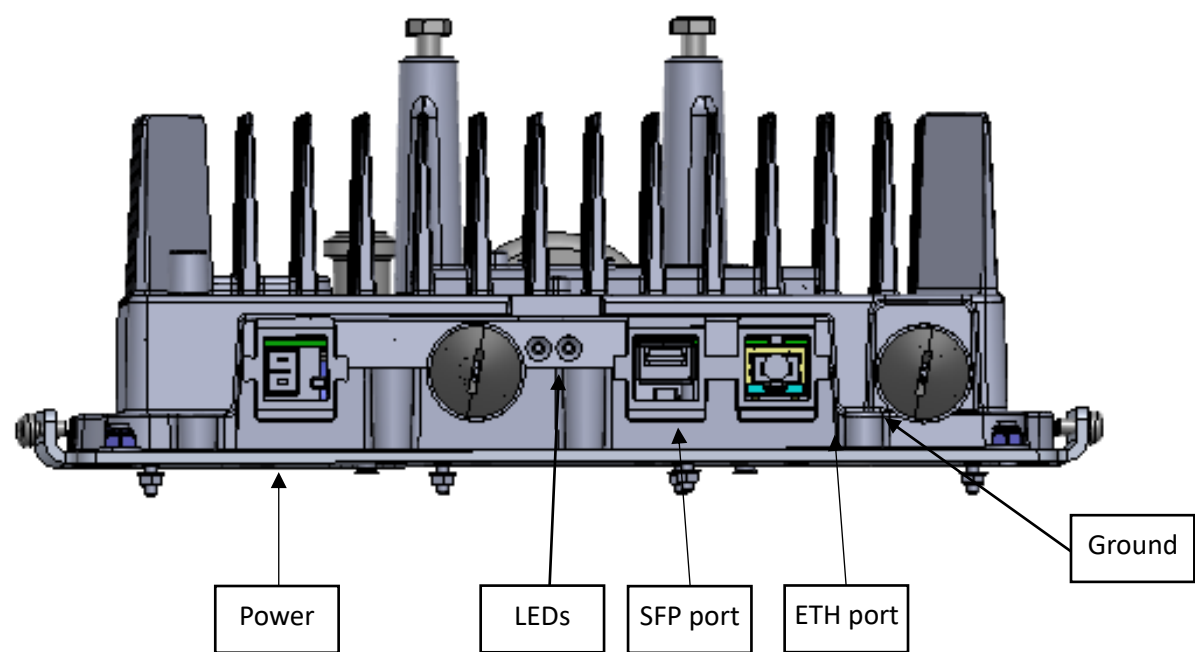


Figure 3: AirSpeed 1900 Bottom Ports



## 2.2.5 Physical Dimensions

AirSpeed 1900 is an outdoor enclosure. The Airspeed 1900 should only be installed in a restricted area.

Table 7. AirSpeed 1900 Physical Dimensions

| Variant       |                                 | Dimensions (H x W x D)                        |
|---------------|---------------------------------|-----------------------------------------------|
| AirSpeed 1900 |                                 | 424 x 252 x 104 mm / 16.69 x 10.15 x 4.09 in. |
| Weight        | Main Unit                       | 8 Kg / 17.6 Lbs.                              |
|               | Mounting Bracket (Bracket Base) | 1 Kg. / 2.2 Lbs.                              |

## 2.2.6 Environmental

Table 8: Environmental and Standard Compliance

| Parameter                                        | Details                                                     |
|--------------------------------------------------|-------------------------------------------------------------|
| IP rating                                        | Main unit: IP66                                             |
| Operating Temperature range                      | -40°C to +55°C (-40°F to +140°F)                            |
| Operating humidity                               | 5% - 95%                                                    |
| Public transportation temperature & humidity     | -40°C to 70° C / -40°F to 158°F<br>Up to 95%                |
| Salt Fog                                         | Salt & Fog – 1,000 hrs. (Telcordia GR-487-CORE / ASTM B117) |
| Ultraviolet A (UVA)/<br>Ultraviolet B (UVB) Rays | According to ASTM G154 Cycle 1                              |
| Wind Resistance                                  | Wind speed: 75 m/s, up to 150 mph gusts                     |
| Vibration Withstand                              | GR-63-CORE, Zone-4                                          |
| Safety                                           | UL 62368-1:2019                                             |
| ROHS                                             | EU ROHS directive - 2002/95/EC                              |
| Impact                                           | Non-metallic enclosure impact per ANSI/SCTE 186 Section 6.3 |
| Radio                                            | FCC CFR 47 Part 90 subpart Y                                |

| Parameter                                 | Details                                                          |
|-------------------------------------------|------------------------------------------------------------------|
| EMC                                       | FCC CFR Part 15 subpart B                                        |
| Surge Withstand                           | +/-2KV (1.2/50u) Differential Mode, +/-4KV (1.2/50u) Common Mode |
| Average Mean Time Between Failures (MTBF) | 22 years                                                         |

## 3 AirSpeed 1900 Installation

AirSpeed 1900 can be installed outdoors on either a pole or a wall.

The Mounting Kit - includes a tilt bracket and pole/wall mounting bracket for fastening the unit to a pole or on a wall. Prior to installation, the tilt bracket must be assembled on the AirSpeed unit and then the mounting bracket must be affixed in place on either the pole or a wall.



The unit depicted in the diagrams below includes an integrated antenna, whereas the AirSpeed 1900 F495 does not. However, the mounting instructions remain the same

### 3.1 Connecting the GPS Antenna

Prior to installation, the GPS antenna should be connected to the unit. The connection is waterproof. Additional weatherproofing is required, see below.

The following describes the connection of the GPS antenna which is installed directly to the top of the unit:

1. Unscrew the protective dust cap from the GPS antenna jack prior to mounting on the AirSpeed 1900.
2. Align the GPS jack with the plug attached to the top panel on the AirSpeed 1900 and screw on. (Tighten to a torque of no more than 0.46 - 0.69 Nm (4.1 - 6.1 in-lbs).

#### 3.1.1 Weatherproofing the Antenna Connections

Weatherproofing of all antenna connection(s) is required. This is done with a layer of self-amalgamating tape followed by an overlayer of PVC tape. Verify the RF connector is completely weather-sealed.



Weatherproofing is best done at the assembly stage to give easier access to the connections. Weatherproofing is to be done to all RF connectors.

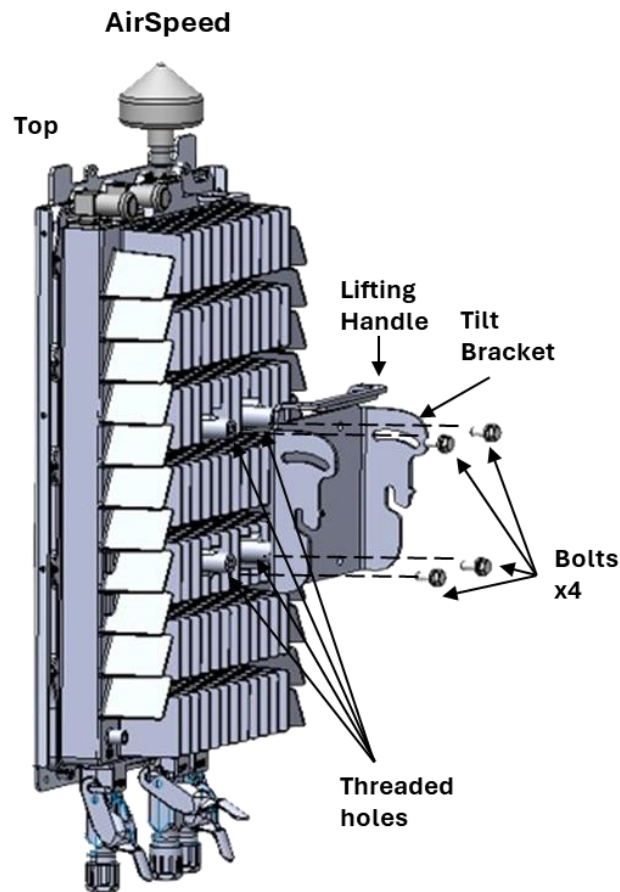
Figure 4: Weatherproof All Cable Connections

## 3.2 Tilt Bracket Assembly

Prior to installation, the tilt bracket must be assembled on the AirSpeed unit (unless pre-assembled).

1. Lay the unit on its face to expose the back. Be careful to protect the surface cover.
2. Orient the tilt bracket so the lifting handle will be assembled in the direction of the top panel, where the GPS and RF ports are located.
3. Line up the four (4) holes on the tilt bracket with four (4) threaded holes on the back of the AirSpeed unit.
4. Insert and screw in the four (4) (M6 X 16) screws to tighten (fastening torque of 40 [Lib\*in] = 46 [Kgf\*cm], as shown below.

Figure 5: Tilt Bracket Assembly



### 3.3 Pole Mounting Assembly – U-Bracket



Using the U-Brackets the AirSpeed 1900 unit can be attached to diameter 50 to 150mm (2.6 to 5.9 inch).



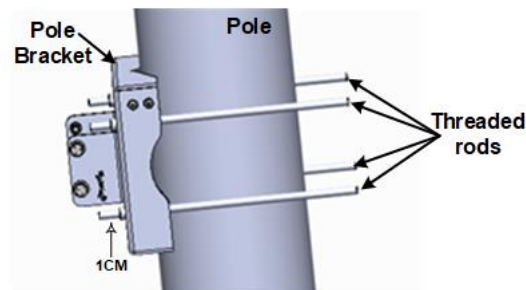
Mount the AirSpeed 1900 unit in an orientation such that the RF connectors are facing up, and power/BH connectors are facing down. This prevents rain water from settling on the port, and thereby, avoiding damage to the unit such as corrosion and electrical short-circuiting.

U-Bracket are used for installing on poles **50-150mm diameter**.

The following describes the pole mounting procedure utilizing the U-Brackets option:

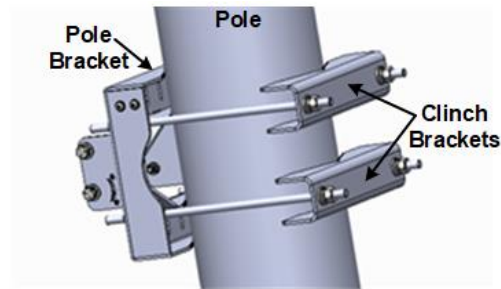
1. Remove the upper two (2) screws from the Pole/Wall bracket and set them aside to be used later. Loosen the lower two (2) screws so they protrude from the Pole/Wall bracket.
2. Select the location on the pole to mount the AirSpeed 1900 mounting bracket.
3. Screw the four (4) 5/16-18 threaded rods into the threads on the back bracket.
4. Allow the threaded rods to protrude through the back bracket at least 1/2 inch (< 1 cm).
5. Position the mounting bracket onto the pole at the required height as shown below.

Figure 6: Position on Pole



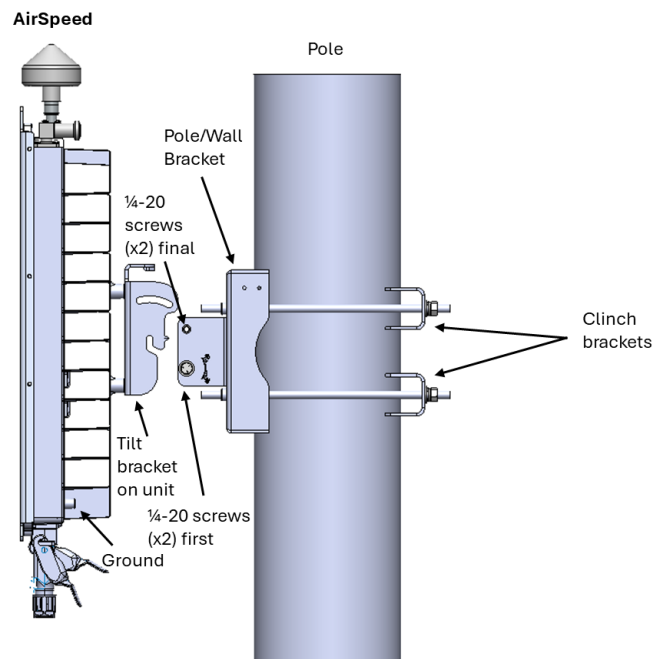
6. Insert a clinch clamp on the two (2) upper threaded rods, put on washers and nuts, and hand tighten.
7. Insert the bottom clinch clamp on the two (2) lower threaded rods, put on washers and nuts, and hand tighten, as shown below.

Figure 7: Mounting Bracket on Pole



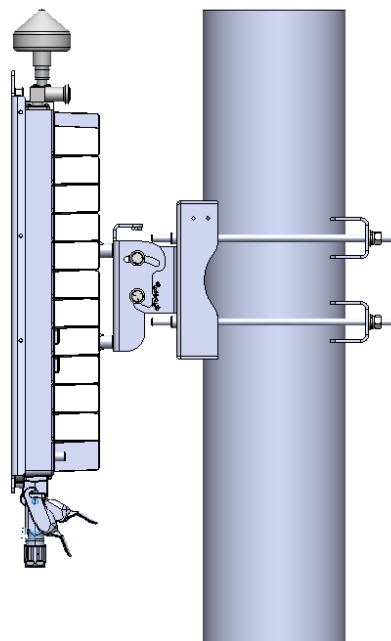
8. Tighten all four (4) nuts. Fastening torque of 132 [Lib\*in] = [151.8 kgf\*cm].
9. Using the lifting handle, carefully lift and align and position the unit so that the lower screws (1 on each side) fit into the notched grooves provided on the tilt bracket (pre-assembled on the unit) and hand tighten.
10. Insert the upper 1/4-20 screws and washers (supplied) and fasten the tilt bracket (pre-assembled on the unit) to the mounting bracket.
11. Adjust the unit so that the GPS is positioned upright. Check and tighten all fixing screws. (Tighten to a torque of no more than 12.5 Nm (9.22 ft-lb) max.).

Figure 8: Pole Mounting Assembly



The following displays the AirSpeed 1900 mounted on a pole.

Figure 9: Mounted on Pole



### 3.4 Pole Mounting Assembly – Stainless Steel Bands

The



Using the stainless steel bands the AirSpeed 1900 unit can be attached to diameter 150 to 250mm (5.9 to 9.8 inch).



Mount the AirSpeed 1900 unit in an orientation such that the RF connectors are facing up, and power/BH connectors are facing down. This prevents rain water from settling on the port, and thereby, avoiding damage to the unit such as corrosion and electrical short-circuiting.

Stainless Steel bands are used for installing on poles **150-250mm diameter**.

The following describes the pole mounting procedure utilizing the Stainless Steel Bands option:

1. Select the location on the pole to mount the AirSpeed 1900 mounting bracket.
2. Position the mounting bracket onto the pole at the required height.
3. Remove the upper two (2) screws from the Pole/Wall bracket and set them aside, they will be inserted later in the upper holes of the bracket. Loosen the lower two (2) screws so they protrude from the Pole/Wall bracket.
4. Insert the clamp bands by passing them through the upper and lower slots in the bracket, in two (2) places, wrap around the pole, and tighten. ([Tighten to a torque of no more than 4.5 Nm \(3.32 ft-lb\) max.](#)).

5. Using the lifting handle, carefully lift and align and position the unit so that the lower screws (1 on each side) fit into the notched grooves provided on the tilt bracket (pre-assembled on the unit) and hand tighten.
6. Insert the upper 1/4-20 screws and washers (supplied) and fasten the tilt bracket (pre-assembled on the unit) to the mounting bracket.
7. Adjust the unit so that the GPS is positioned upright. Check and tighten all fixing screws. (Tighten to a torque of no more than 12.5 Nm (9.22 ft-lb) max.).

Figure 10: Pole Mounting - Maxi Clamps SS Bands

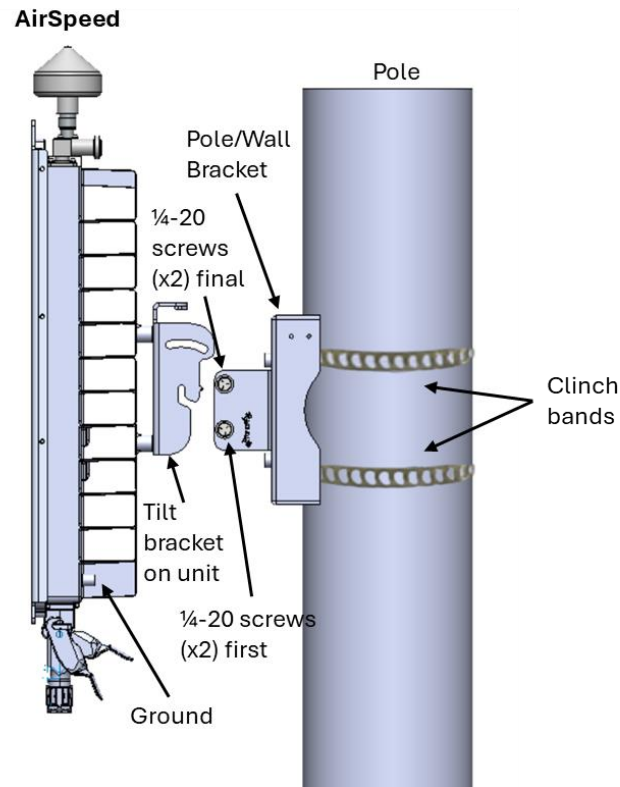
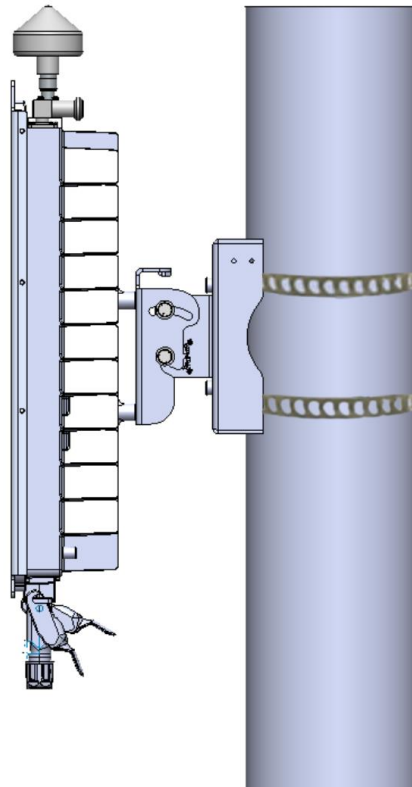


Figure 11: Mounted on Pole - SS Bands



### 3.5 Wall Mount Assembly

The following describes the wall mounting procedure:

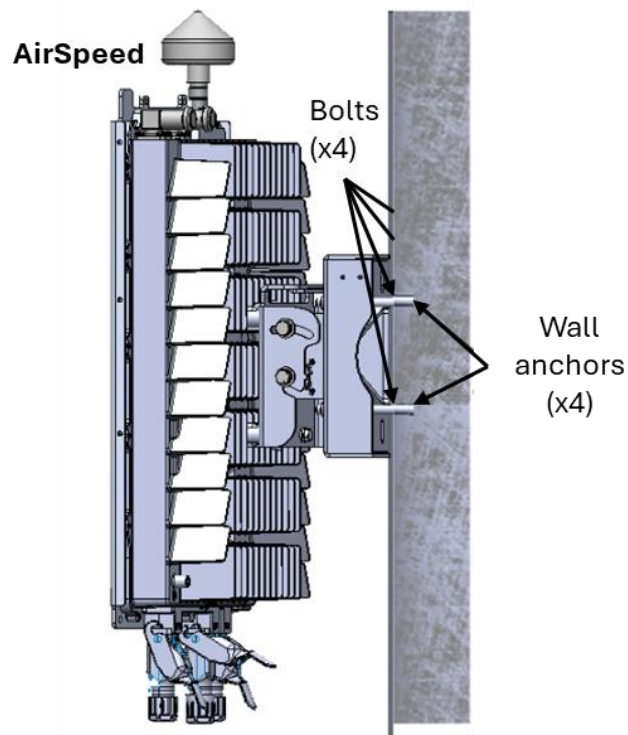
1. Select the location on the wall to mount the AirSpeed 1900 mounting bracket.
2. Remove the upper two (2) screws from the Pole/Wall bracket and set them aside to be used later. Loosen the lower two (2) screws so they protrude from the Pole/Wall bracket.
3. Position the Pole/Wall bracket onto the wall at the required height and mark where to drill the holes.
4. Insert screws and appropriate wall anchors (not provided) and tighten in place.



Wall anchors (x4) and necessary hardware are not supplied by Airspan and are the responsibility of the installer. Use appropriate wall anchors according to field conditions.

5. Using the lifting handle, carefully lift, align, and position the unit so that the lower screws (1 on each side) fit into the notched grooves provided on the tilt bracket (pre-assembled on the unit) and hand tighten.
6. Insert the upper 1/4-20 screws and washers (supplied) and fasten the tilt bracket (pre-assembled on the unit) to the mounting bracket.
7. Adjust the unit so that the GPS is positioned upright. Check and tighten all fixing screws. (Tighten to a torque of no more than 12.5 Nm (9.22 ft-lb) max.)

Figure 12: AirSpeed on Wall



### 3.6 Tilt Adjustment

After assembly, the unit can be tilted by adjusting it upward or downward.



As this AirSpeed 1900 variant uses an external antenna, tilting the unit has no effect and hence can be avoided.

## 4 Connect and Manage Cables

The following section explains the grounding procedure, cable preparation, external antenna assembly, and general instructions on how to connect the DC power cable and the Fiber Ethernet (SFP) cable to the AirSpeed 1900 unit.



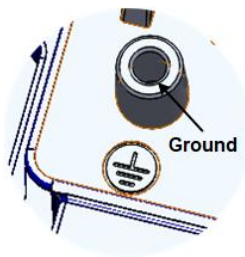
Grounding cable, Fiber Ethernet cable, SFP connector adaptor, and DC power cables are not supplied as part of the AirSpeed 1900 and can be ordered separately.

### 4.1 Grounding

The AirSpeed 1900 requires a secure ground connection and a grounding screw (M6x1) fitted with a flat washer and a lock washer provided on the back and marked with the universal ground symbol.

The cable (not supplied) should be grounded and bonded according to international or local standards.

Figure 13: Ground Connection



## 4.2 LED Display

Two LEDs are displayed on the inside of the panel of the unit, providing unit status indication - reporting system status: System / Access, Backhaul.

These are software-controlled to provide a visual indication to the Installer and are illuminated once power is applied to the unit. It can be turned off during normal operation.

There are two (2) LEDs on the unit:

- Backhaul LED – indicates if the unit is connected to the network
- System LED – see table below

Table 9: LED Display

| State Name          | Color          | Description                                                                           |
|---------------------|----------------|---------------------------------------------------------------------------------------|
| Powering up         | White          | The unit is powering up.                                                              |
| Software loading    | Blinking Green | The unit is loading its SW.                                                           |
| Unit up with RF Off | Blue           | The unit is up, and RF is off.<br>Configured by the operators to RF off on all cells. |
| Normal Operation    | Green          | Normal operation (Radiating on at least one of the cells).                            |
|                     |                | The LEDs will be switched off after 10 minutes.                                       |
| Major Alarm         | Orange         | Major alarm indication.<br>Service is not affected.                                   |
| Critical Alarm      | Red            | Critical alarm indication.<br>Service is affected.                                    |

Table 10: BH LED Display

| State Name       | Color          | Description                                                             |
|------------------|----------------|-------------------------------------------------------------------------|
| Powering Up      | White          | The unit is powering up                                                 |
| Standby          | Blinking Green | A physical link is pending                                              |
| Normal Operation | Green*         | Normal operation - link is up                                           |
|                  |                | The LEDs will be switched off after 10 minutes                          |
| Critical Alarm   | Red            | Critical alarm indication - physical link is not OK Service is affected |

\* In the case where two ports are in use (for unit cascading), the HB LED will turn to 'Green' if at least one port is 'up'.

## 4.3 Single Mode LC Cable Insertion



The fiber cable to be used is Single Mode fiber with LC connector. The SFP used inside the product is Finisar FTLF1318P3BTL so make sure the other side can interoperate with this SFP.

The following displays the proper steps for SFP cable preparation:

1. Have the pre-assembled LC connector Single Mode fiber cable ready.

Figure 14: Pre-assembled Single Mode LC Cable



2. Remove the caps from the LC connector.
3. Insert the LC connector of the Single Mode fiber cable into the connector. Verify when engaged.

## 4.4 DC Cable Preparation

The following demonstrates the recommended assembly instructions, hardware, and tool requirements for the proper DC cable assembly used by Airspan products.



### Power Cable:

- Diameter - 8.4mm to 9.4mm
- Wire Size - AWG16 to AWG12



### Safety - Disconnection of power supply

- When the AirSpeed unit is connected directly to wiring a suitably rated and easily accessible circuit breaker shall be incorporated externally to the equipment.



**WARNING: This unit incorporates Double Pole/Neutral Fusing. Both the Line & Neutral have fuses in them.**

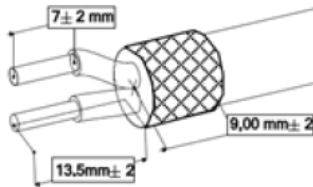


**WARNING: The onsite source circuit breaker (6A) should be gang operated, two (2) pole (single phase type).**

The following displays the proper steps for DC cable preparation:

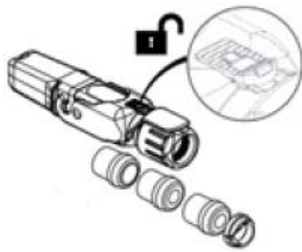
1. Strip back and remove the outer sheath to a length of  $9.0\text{mm} \pm 2$  (0.35 in) to expose the inner insulated wires to a length of  $13.5\text{mm} \pm 2$  (0.53 in). Then strip back  $7\text{mm} \pm 2$  (0.27 in) of the inner core insulation.

Figure 15: Stripping Dimensions (DC Cable)



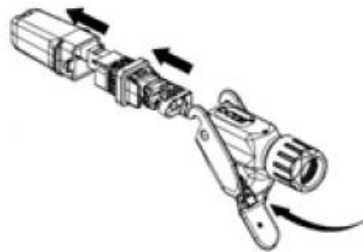
2. Open the housing lock by sliding up then lift the clamp handle.

Figure 16: Open Housing Lock



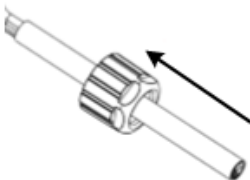
3. Separate the housing into its component sections.

Figure 17: Separate into Sections



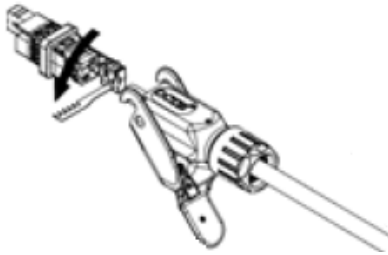
4. Insert the gland nut through the other end of the cable.

Figure 18: Insert Gland Nut



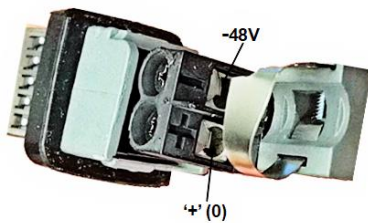
5. Loosen the strap clamp and feed the prepared end of the source power cable into the inner part of the DC connector housing.

Figure 19: Pass DC Cable Through



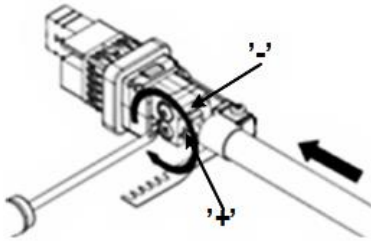
Verify the wire polarity before securing, as shown below.

Figure 20: Power Wire Connection



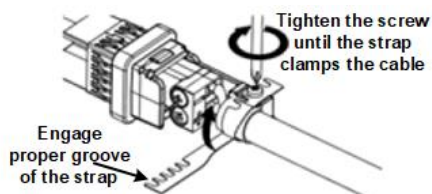
- Secure the prepared ends of the cable into the inner part of the connector housing and tighten the 2 screws. (Tighten to a torque of no more than 40 N-cm (3.54 lb-in) max).

Figure 21: Tightening of Set Screws



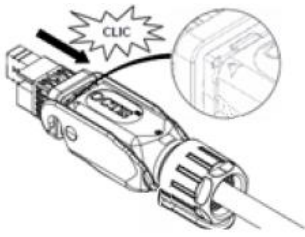
- Tighten the strap clamp screw as shown below.

Figure 22: Tighten the Strap Clamp



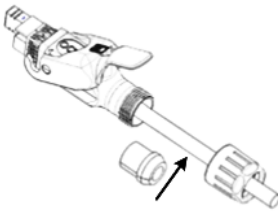
- Insert into outer housing until “click” in place, align marks for proper alignment.

Figure 23: Align Marks + Click in Place



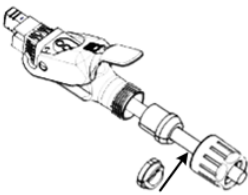
9. Place the split rubber gland onto the cable.

Figure 24: Place Split Rubber Gland



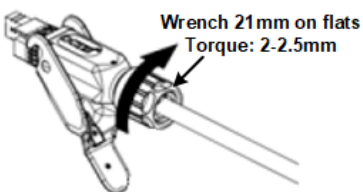
10. Place the tightening cone onto the split rubber gland.

Figure 25: Place Tightening Cone on Split Gland



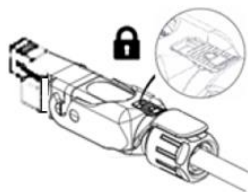
11. Tighten the gland nut with a 21mm wrench, to a torque of no more than 2-2.5 Nm (1.47 – 1.84 ft-lb) max.

Figure 26: Tighten Gland Nut



12. Insert the connector into the Power port on the bottom of the chassis. Verify that the connector's latch faces the rear of the unit to enable potential unlocking.
13. Close the lever and secure the lock by sliding the secondary lock/button, so that the lever can't be lifted.

Figure 27: Secure Housing Lock



When securing the cable verify there is no tension on the connector so that it is easy to disconnect and reconnect for future maintenance actions.

## 4.5 External Antenna Assembly



Airspan recommends the use of DC-grounded antennas to protect the unit from surges. In AirSpeed n1900 F495 however this is not mandatory and the unit can be operated with non-DC grounded antenna.

Surge protectors to be used with the non-DC grounded antenna can be purchased from Airspan.



**Power down the AirSpeed unit prior to disconnecting the antenna, to prevent damage.**

The AirSpeed 1900 unit can utilize remotely attached antennas.

For installation of the remotely mounted antennas follow the antenna manufacturer's instructions and connect the antenna to the AirSpeed using the appropriate cables. (Weatherproofed N-type Helix RF cables (ordered separately)).

1. Carefully unscrew and disconnect each RF cable that connects the integrated antenna to the unit.
2. Verify the correct ports for the appropriate connection.
3. Screw on a protective cap(s) on the integrated antenna cable, to prevent environmental damage, in the event they need to be re-connected. Weatherproof the caps (with a layer of self-amalgamating tape followed by an overlayer of PVC tape).
4. Gather the cables securely together to prevent damage.
5. Attach, connect, and secure the RF cable(s) between the external antenna and the appropriate RF connection on the top of the unit.
6. Weatherproof all cable connections, with a layer of self-amalgamating tape followed by an overlayer of PVC tape. See [Weatherproofing Antenna Connections](#).



**Do not over-tighten the RF connector. RF failures can result when the RF connector is over-tightened..**



## Appendix A. Installation Checklist

During installation, review and perform all the steps on this checklist (in the given order).

This checklist is meant for the person who performs the AirSpeed 1900 installation.



To make sure you complete all the tasks, detach, or print this checklist and use it as a job aid. After performing, check off each task.

| Procedure                  | Action                                                                                                                                       | Check If Performed       |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Verify the prerequisites   | Verify the site requirements                                                                                                                 | <input type="checkbox"/> |
|                            | Verify the installation requirements                                                                                                         | <input type="checkbox"/> |
|                            | Verify the tool requirements                                                                                                                 | <input type="checkbox"/> |
|                            | Verify the parts & kits required                                                                                                             | <input type="checkbox"/> |
| AirSpeed 1900 installation | <ul style="list-style-type: none"> <li>• Install tilt bracket on the AirSpeed 1900</li> <li>• Install the GPS antenna on the unit</li> </ul> | <input type="checkbox"/> |
|                            | Install the Pole/Wall bracket on the Pole or Wall                                                                                            | <input type="checkbox"/> |
|                            | Install AirSpeed 1900 on the mounting bracket (as required)                                                                                  | <input type="checkbox"/> |
| Connect & manage cables    | Connect ground, SFP & Ethernet cable(s)                                                                                                      | <input type="checkbox"/> |
| Connect power system       | Connect power cable                                                                                                                          | <input type="checkbox"/> |

# Appendix B. Abbreviations

Table 11: Abbreviations & Definitions

| Term | Expansion                                                                                                                                                                                                                                                     |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| dB   | <b>Decibel:</b> A logarithmic unit used to describe a ratio (such as power ratio in radio telecommunications).                                                                                                                                                |
| dBm  | An abbreviation for the power ratio in decibels (dB) of the measured power referenced to one milliwatt (mW). It is used as a convenient measure of absolute power because of its capability to express both very large and very small values in a short form. |
| gNB  | Next generation NodeB.                                                                                                                                                                                                                                        |