AS NET

FlexNET IEEE 802.11 A/B/G
Wireless Broadband Wi-Fi System

605-0001-802 Rev A

FlexNET Access Products

**FlexNET ASN-900P:
Dual RF, 5 GHz Integrated Antenna, PoE**

User's Guide

Airspan

Connecting the World

PREFACE

Thank you for purchasing Airspan's FlexNET ASN-820P/900P Base Station (hereafter referred to as FlexNET) device. The FlexNET devices are a part of Airspan's AS.NET product family.

This section discusses the purpose, audience, conventions, and customer support of this guide.

Purpose

This Web-based Wi-Fi management User's Guide provides step-by-step instructions for configuring and managing your ASN BS using a standard Web browser.

Targeted Audience

This guide is intended for the end user.

Conventions

This guide uses the following typographical conventions:

Convention	Meaning	Example
Bold	Command, icon, button, and field	Click the **Next** button.
"**To**" in bold face and at the beginning of a sentence	Introduces a numbered procedure	**To** download a SW file: 1. …
	Note that provides useful information	--
	Warning that provides information that can prevent and avoid bodily or mechanical harm	--

SAFETY INSTRUCTIONS

This document must be reviewed for familiarization with the product and instructions before operation.

Verify that an un-interruptible safety earth ground exists from main power source and the ground circuitry of the product.

Verify that correct AC power source is available for the AC power adapter to produce 56 VDC for the product.

Disconnect the product from operating power before cleaning.

Warning!
A professional installer must install the AC power adapter, base station and antennas.

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment. (FCC 15.21)

Note on electromagnetic emissions

This device complies with part 15 of the Federal Communications Commission (FCC) rules. Operation is subjected to the following conditions:

This device may not cause harmful interference.
This device must accept any interference received including interference that cause undesired operation
Warning! Electromagnetic radiation. Please keep this product and related antennas at a distance 20 cm from human body when operational

Regulatory notice

The specifications and parameters of the device described in this document are subject to change without notice.

For American regulatory information, see www.fcc.gov. For Canadian regulatory information, see www.ic.gc.ca.

This equipment generates, uses and radiates energy on radio frequencies and, if not installed and used in accordance with this guide, 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 off and on, the user is encouraged to correct the interference by one or more of the following methods:

reorient or relocate the receiving antenna
move the equipment and receive farther apart
connect equipment to an outlet on a circuit different from that to which the receiver is connected

The FlexNET product is only allowed to be used with Airspan antennas and accessories (PSU-4 power supply) and power dividers. In USA and Canada maximum allowed transmit power levels and channel frequencies are shown in Appendix F.

INTRODUCTION

This guide contains information on how to operate and manage the FlexNET products.

Package contents

The FlexNET package contains the following items:

ASN-820P or ASN-900P product
Mounting kit with down tilt possibility
Two weather proof RJ-45 connector kits (MOB00210)
Indoor power supply unit PSU-4
Factory default tool
Mounting instruction
Documentation CD-ROM

Physical interfaces and description

Key features of the FlexNET product are:

Two external antenna connectors
Two 10/100 Base TX Ethernet ports
Operation indication LED
RS-232 interface for local management

Antenna

The ASN-900P is delivered with an integrated 5.150-5.875 GHz 23dBi planar antenna. Aluminium enclosure

The base station unit uses an aluminium enclosure that supports both outdoor operating environments and an industrial temperature operating range (-40…+55 °C).

Connectors

All connectors are located on the bottom of the housing. The FlexNET product has two external antenna connectors and two Ethernet connectors.
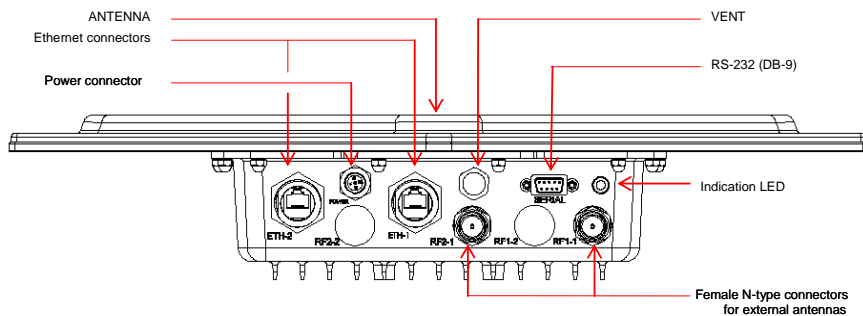

Figure 1 The FlexNET product bottom view

LED indicator

The LED indicator is also located on the bottom of the housing. The operation of the LED indicator is as follows:

Reboot: flashing blue once per second
Committing configuration and initializing the radios: flashing blue twice per second
Factory reset: solid red when erasing the configuration
Upgrade software: the colour of the LED varies between red and blue

Vent

The vent can be found on the bottom of the housing as well. The vent equalizes pressure and lets moisture out of the chassis. It does not need your attention

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Serial RS-232 interface

The serial RS-232 interface can be used for local management, as well as resetting the unit to factory defaults. The serial RS-232 connector on the unit is standard DB9 female connector. See Appendix K Information for RS-232 interface for more details.

> **Note1:** Unplug the serial cable from the PC when powering up the ASN Link unit. With some PCs the serial cable connection can cause factory reset during power up
>
> **Note2:** Unplug the serial cable from the PC if it is not used

Main functionalities

The FlexNET products (ASN-820P and ASN-900P) provide last mile Wi-Fi connections to customers. These IEEE 802.11a/b/g-standard based Wi-Fi products offer several features that support deployment of wireless broadband access services. Wi-Fi compliant access services can be built with FlexNET ASN-820P and ASN-900P products. Wireless broadband services with these standard products can also be deployed in enterprise and industrial networks. The FlexNET products include base station, high-gain antennas, robust power supply and advanced network management features.

The FlexNET products support IEEE 802.11a/b/g standards and use frequency ranges between 2.4-2.4835 GHz and 5.470-5.725 GHz (ETSI) or 5.725-5.850 GHz (UK & FCC).Both products have two radio units, which can be configured independently. While the ASN-820P is used with external antennas the ASN-900P also includes an integrated narrow beam antenna for possible link connections.

Main features of the FlexNET products support network level functionalities, where standard IP protocols and IEEE 802.11a/b/g compliant radios are used. These network level features are based on deployment with Airspan Networks ControlNET server, which supports DHCP server, centralised user management, connection handovers between subnets and bandwidth management. DHCP server and bandwidth management features support professional ISP (Internet service provider) features that can be offered with FlexNET products.

INSTALLATION INSTRUCTIONS

The FlexNET product is designed for outdoor installation environment, on a tower, a tall building or an antenna mast.

A professional installer must install the base station and the antennas. The installer should also be familiar with network structures, terms, and concepts.
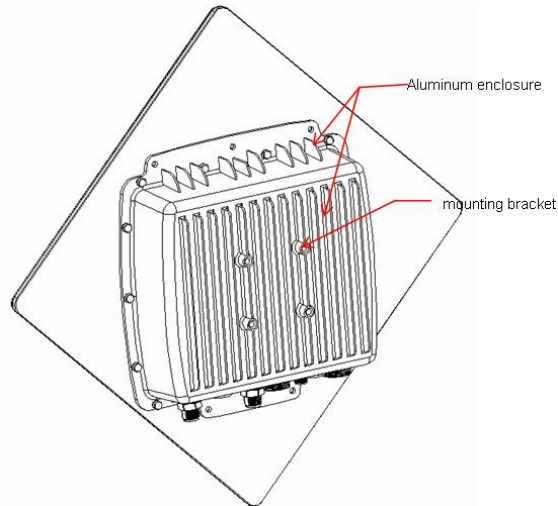

Installation direction

Connectors must always be downwards in outdoor installations. In indoor installations (e.g. warehouses etc.) direction can be freely selected if the integrated antenna is not used.

Antenna mast installation

The following figures present the installation of an ASN-900P device for an antenna mast pipe. The requirements for the antenna pipe diameters are 45…60mm (approx. 1 ¾…2 1/3 inches).
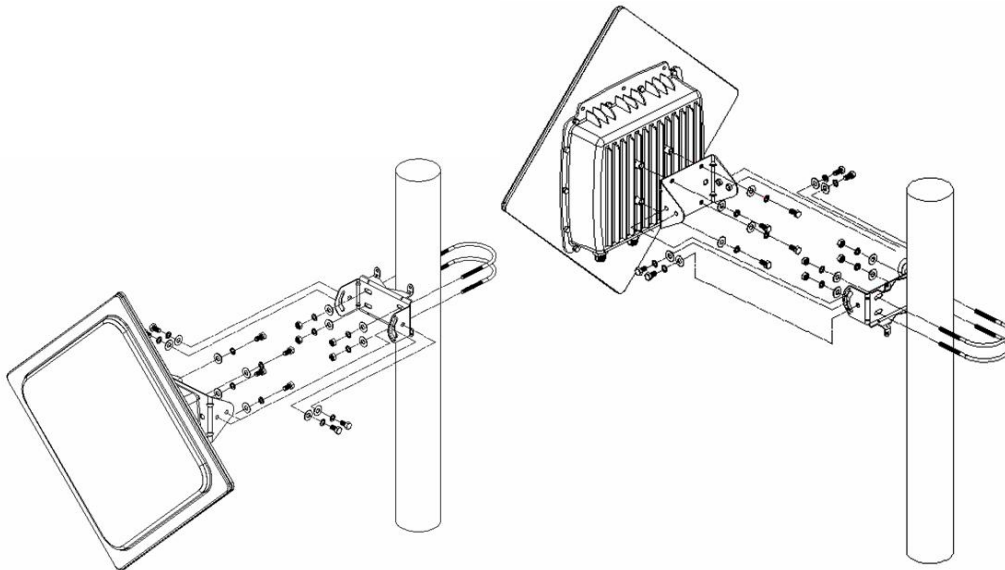
Aligning the antenna

Installation technician must mechanically align the integrated antenna or external antennas for the best possible communication over the link jump. ASNET antenna

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alignment tool can also be used for the alignment. See ASNET antenna alignment tool user guide for more information.

Power divider

You may connect two sector antennas to one radio by using a power divider. For the best possible operation, the antennas using the same radio should point directly opposite directions from each other. Also the length of the cables between the antennas and the power divider should be the same to ensure even signal strength to both cells.

The power divider reduces the output signal level by approximately 3dBm.

The following figures present the installation of the power divider.
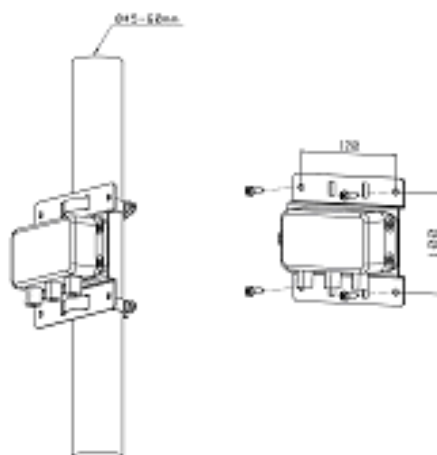
Lightning Protection

Airspan requires that a surge arrestor is always used with an external antenna both to protect against lightning strikes and to ground the external antenna from its connector.

Airspan's surge arrestor MOB00208 can protect the radio units of a base station from damage due to a lightning strike. Statistically a lightning strikes to the highest electrical conductor in an area and then follows the lowest resistance and shortest path to ground. Since antennas are usually mounted in high places, they are very susceptible to lightning strikes. Therefore, the antenna location and the way how it has been mounted is the major point when discussed about the lightning protection.

Airspan recommends you not to mount your antennas on the highest building or tower and place them always at least a few feet below the top of the mast. Furthermore, the mast should be grounded by using a thick grounding cable.

Protection of the radio unit can be provided by installing a surge arrestor following the antenna connector. Surge arrestor MOB00208 uses a gas discharge tube to protect electrical equipment from lightning surges, which means that the tube must be replaced after a strike. Because the surge arrestor will not inform the user that it is going to a short circuit some repetitive maintenance is required.

It is also important that the surge arrestor is grounded with a grounding cable. This is needed to conduct the lightning bolt energy straight to the ground instead of the radio unit. The shorter the wire is the better result is achieved. When the external antenna is grounded from its connector, it also minimizes the risk that electric static charges would damage the radios. Electric static charges are very common in windy and dry environments as well as in mountain range.

The following figure demonstrates how to install the surge arrestor MOB00208 correctly.

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Antenna

Surge Arrestor

Grounding cable

RF cable

Installation pole
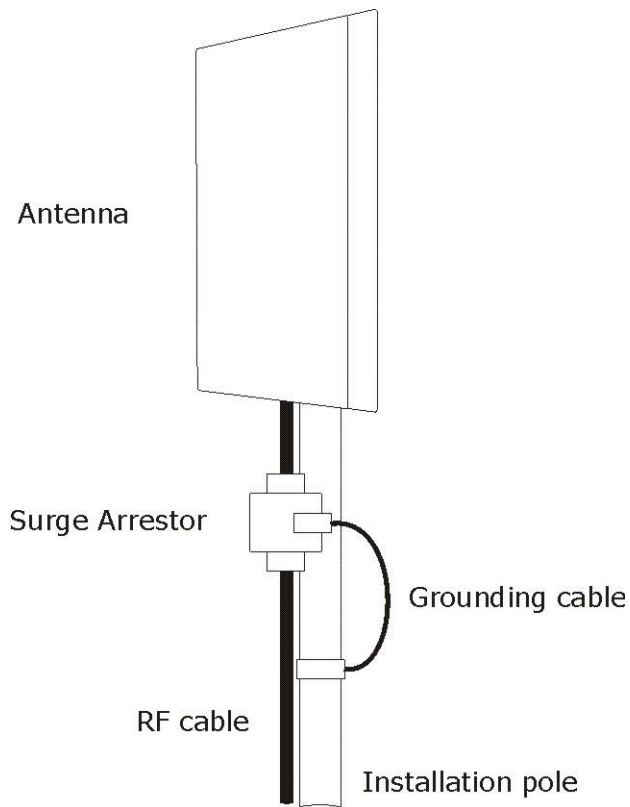
Power cabling

The ASN-900P and ASN-820P have PoE (Power over Ethernet) feature. With a PSU-4 power supply unit the supply power can be feeded to the FlexNET unit via Ethernet cable. The PSU-4 power supply is an external unit designed for indoor use only. The supply voltage of the power supply is 56 VDC.

Detailed cabling instructions are in Appendix A.

Ethernet cabling

The maximum length of Ethernet cabling without repeaters or amplifiers is 100 meters (330 feet). Ethernet cabling must fulfill CAT5 category FTP outdoor cable specifications. Detailed cabling instructions can be found in Appendix A.

Protective connector cover

If the Ethernet connectors are not used you must cover the connectors by a protective cover. The FlexNET product is shipped with protective covers on both Ethernet connectors by default.

Applying coax seal tape

When using the unit with external antennas, you must weather seal the N connectors using seal tape. N connectors that are not properly sealed permit moisture to enter the connection, which leads to performance degradation or coverage problems.

On Edit VLAN mapping panel you can change every interface on bridge (Ethernet or VSSID) to either trunk or untagged. When untagged interface is part of VLAN it will accept normal untagged packets and send packets out to the untagged interface. Trunk is so called tagged interface for all VLANs present on unit.

Packets entering to the untagged interfaces are forwarded to a trunk interface with a corresponding VLAN tag. Trunk interfaces only send and receive VLAN tagged packets for VLANs present on unit, non present VLANs and untagged packets are dropped.

Figure 13 Mapping the VLANs

Changing radio interface settings

Click **NETWORKING>radio1** or **NETWORKING>radio2** links in the configuration menu to open the configuration pages for the first and second radio interfaces, respectively.

Interface settings specific to the radio interfaces are described here (see Figure 14). Depending on the product version you are configuring some of the Radio Settings might be missing or appear differently.

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Figure 14 Configuring the radio interfaces

Set the radio Operation mode (ASN-900 only)

Use the AP/Station buttons to specify whether the interface will operate in AP or Station mode.

📝**Note:** If Station mode is chosen, some of the features described below are not applicable.

Set the Wireless mode

Use the Wireless mode buttons to specify whether the interface will operate as an 802.11a, 802.11b, 802.11g interface.

Bandwidth selection

When 802.11a wireless mode is used in some countries it is possible use a 40MHz channel bandwidth instead of the normal 20MHz. In AP mode the channel bandwidth must be explicitly defined, but in Station mode auto mode can be selected. If automatic channel bandwidth is selected the station first scans 40MHz channels and after that 20MHz channels. Naturally scanning takes longer time if automatic channel bandwidth is used.

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In 40MHz mode link throughput is almost doubled, but due to increased noise levels link budget is reduced by 3dB.

Channel selection (AP mode only)

Use the Channel selection combo box to select an operating frequency for the wireless connection (AP mode only) or the client access. The radio channel frequency is expressed in MHz.

Dynamic frequency selection (DFS) is always enabled in ETSI and UK products as a default setting when the unit is operating in 802.11a mode.

It is possible to select a preferred channel, which is used until possible radar interference is detected on the selected channel. Any radar interference detection triggers the channel change.

Before using any channel the unit monitors the channel for one minute. This causes a delay in the link operation after reboot or reconfiguration.

Set transmit power

Use the Radio tx power combo box to set the transmit power. The radio transmit power directly affects hop length. Do not exceed the maximum EIRP (effective isotropic radiated power) power (EIRP = tx power - cable loss + antenna gain), which is limited by the local radio authority.

When using external antennas, the cable loss should also be taken in account. Use the Radio tx power combo box to select your desired power level and click the OK button.

With highest modulation levels the transmit power level is reduced a bit. (See Appendix G)

Note: When using external antennas, make sure that the maximum EIRP power does not exceed the applicable power limitations set by the national radio legislation. Check applicable maximum radio transmit power + antenna combinations from Appendix F of the manual where equipment details are shown

Data rate

Using the Data Rate combo box, you can set a constant data rate. If "best" is chosen, the unit will always use the best possible data rate.

Beacon interval (AP mode only)

This represents the interval of the beacons that VSSID sends, in milliseconds. Beacons include basic information of the access point, and are used by stations to determine which access point to use. With multiple VSSIDs they will also easily generate significant amount of frames with each VSSID sending its own beacons. Valid values are in range {25-60000}, though high values may cause problems for clients trying to find access points. Default value is 100ms. To change the Beacon interval, enter the new value in the Beacon interval text box and click **OK** button.

Note: Active scan is not allowed in 11a mode in ETSI and UK regulation domains, therefore clients are not allowed to Probe for suitable APs. Due to this regulation, it is not recommended to set the beacon interval higher than 300ms. Some clients might not detect AP's beacons if higher value is used.

Maximum link length

Use maximum link length text box to adjust maximum link distance in meters. Link length can be adjusted from 500m up to 55000m (55km)

When configuring a Point-to-Point link, set the same value for maximum link length to both ends of the link connection.

When configuring a Point-to-Multipoint link, set the maximum link length to correspond the longest link connection in your PtMP configuration.

Antenna Settings (ASN-900 only)

Choose whether you want to use an integrated or external antenna. Integrated antenna is available for radio 1 only.

Defining the antenna gain (AP mode only)

Enter the gain of the antenna (for example 23) in use in this field.

Integrated antenna (ASN-900 only)

Integrated antenna is a 23dBi gain panel antenna. After you have selected integrated antenna from combo box (Integrated/External), write the antenna gain "23" to Antenna Gain input value in the related text box.

External antenna

External antennas of varying gain levels can be used. We recommend using Airspan PlanAir antennas only. External antennas that Airspan recommends are typically between 8.5-30dBi in their gain. Write the antenna gain value into the related text box.

Add Virtual SSID (AP mode only)

Multiple SSIDs can be added when radio interface is in active bridge. To add new SSID enter SSID name in **Virtual SSID name** field and press **Add** button.

Changing VSSID settings

Click **NETWORKING>***ssid* links in the configuration menu to open the configuration pages for the first and second VSSID, respectively.

VSSID settings specific to the radio interfaces are described here (see Figure 15). Depending on the product version you are configuring and radio operation mode, some of the Radio Settings might be missing or appear differently.

APPENDIX A DETAILED INSTRUCTIONS FOR CABLING

PSU-4 power supply specifications

The PSU-4 power supply is used with the FlexNET units that have PoE (Power over Ethernet) powering system. It converts the 100…240V AC input voltage to a 56V DC output voltage and transfers this power to the FlexNET unit by using the wires of the Ethernet cable.

Figure 41. The PSU-4 power supply.

PSU-4 specifications:

Power over Ethernet power supply.
Input voltage level: 100-240V AC
Output voltage level: 56V DC
Output maximum power level: 30W
Environmental specifications: 0°C…+40°C
Used Ethernet cable pins to transfer power:
-   Pins 3,6 +56V DC
-   Pins 1,2 RETURN

> 📝**Note:** PSU-4 is applicable for indoor use only.

Cabling

The following components are needed to perform the cabling of the FlexNET unit:

-   PSU-4 power supply (see Figure 41).
-   External Ethernet connector kit (MOB00210) for outdoor installation (see Figure 43).
-   Two Ethernet cables. One for transfer both the DC power and the data from the PSU-4 to the FlexNET unit and another cable to transfer the data from the network unit (NC, server or switch) to the PSU-4. **Note! Use electrically shielded and weatherproof Ethernet cables on outdoor installations.**
-   One AC power cable with IEC socket to connect the PSU-4 to the AC network.

A step-by-step instruction to perform the cabling:

1. Insert the IEC socket of the AC power cable to the PSU-4 (see Figure 42) and then insert the other end of the AC power cable to the AC network (100-240V AC). **Note! The type of the plug of the AC power cable depends on the nation standard**. When the cable is plugged, the PSU-4 starts a self-test function, which is indicated by the flashing three LEDs (green, red and green) on the gable of the PSU-4. If the self-test is performed with success, only the green LED on the position "**ON**" stays on.

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Figure 42. The installation of the AC power cable to the PSU-4.

2. Take the external Ethernet connector kit (MOB00210) as illustrated in Figure 43 and an Ethernet cable that have basic or snagless boot RJ45 connectors as presented in Figure 44. **Note! Ethernet cables with moulded boot connectors (see Figure 43) can not be used properly with the external Ethernet connector kit (MOB00210).** This being the case, it is recommended that Ethernet cables only with snagless boots or basic connectors are used. The external Ethernet connector kit MOB00210 is used to achieve waterproof Ethernet and power installation for the FlexNET unit.

Figure 43. External Ethernet connector kit MOB00210.
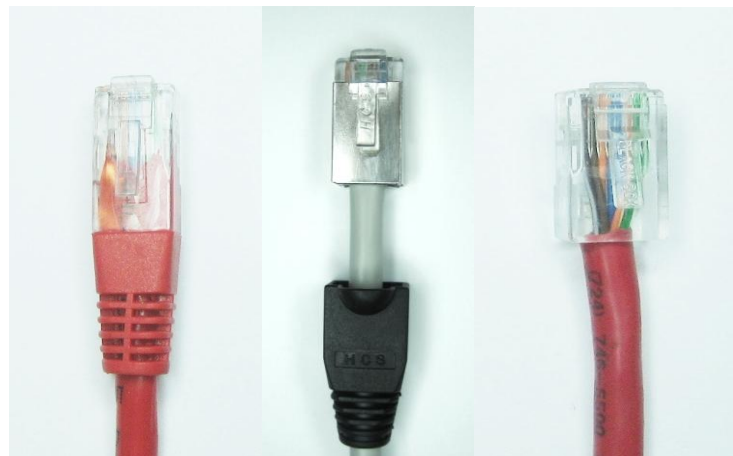
Figure 44. Ethernet cables with a moulded (left) and a snagless boot (central), as well as a basic (right) RJ45 connectors.

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3. Assemble the external Ethernet connector to the Ethernet cable with following steps:

A. Remove the snagless boot backwards.
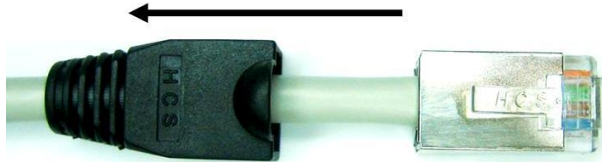
Figure 45. Removing the snagless boot of the RJ45 connector.

B. Insert the Ethernet cable through the end piece as shown in Figure 46 below.
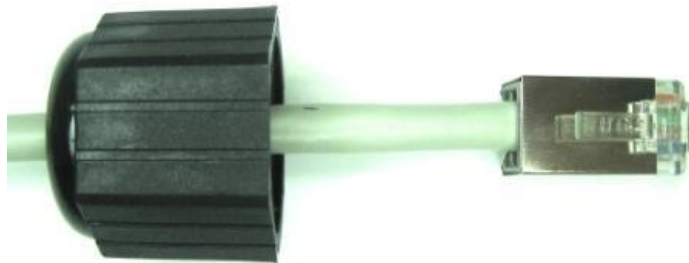
Figure 46. Installation of the end piece (clamp).

C. Insert the angular O-ring gasket to the groove inside the piece with threads as shown in Figure 47 below.

Figure 47. Installation of the angular O-ring gasket.

D. Insert the Ethernet cable also through the piece with threads as shown in Figure 48 below.

Figure 48. Installation of the piece with threads to the Ethernet cable.

E. Insert the round O-ring gasket on the groove of the head piece as shown in Figure 49 below.

Figure 49. Installation of the round O-ring gasket.

F. Insert the head piece inside the metallic strain nut as shown in Figure 50.

Figure 50. Combining the head piece and the metallic strain nut.

G. Insert the Ethernet cable through the combination of the head piece and the metallic nut below and screw the pieces together as shown in Figure 51.
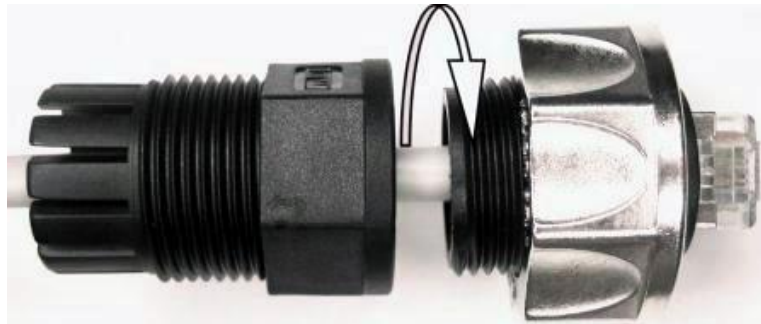
Figure 51. Installation of the head piece to the Ethernet cable.

H. Insert the split plastic piece to the Ethernet cable and slide it inside the other pieces so that it will be connected to the back of the RJ45 connector (see in Figure 52).

Figure 52. Installation of the split piece inside the other pieces.

I. Insert the round and split rubber gasket to the Ethernet cable and slide it inside the piece with threads as shown in Figure 53.

Figure 53. Installation of the rubber chunk inside the piece with threads.

J. Strain the end piece so that the rubber chunk seals and strains the Ethernet cable (see Figure 54).
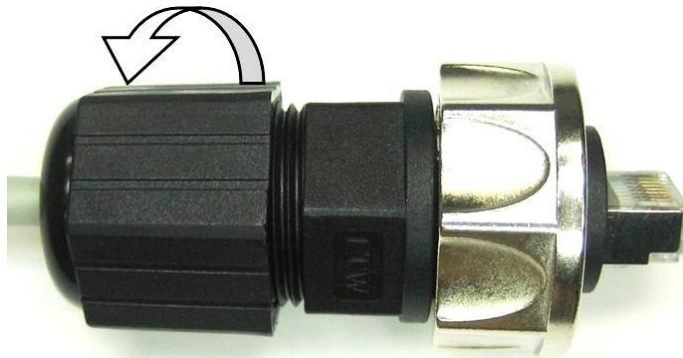
Figure 54. Strain of the end piece (clamp).

4. Insert the other end of the Ethernet cable to the "**OUT**" port of the PSU-4 power supply as shown in Figure 55.

Figure 55. Installation of the (power + data) Ethernet cable to the PSU-4.

5. Install the other end of the (power + data) Ethernet cable to the Ethernet port (ETH-1) of the FlexNET unit as shown in Figure 56. After the cable is plugged, the PSU-4 starts to identify the PoE unit. If the identification is performed with success, the "**CONNECT**" LED lights up on the PSU-4 and the FlexNET unit starts to boot up, which is indicated by flashing blue LED on the FlexNET unit.
    Note! Power over Ethernet power supply can be used only with FlexNET units that have a letter "P" on the model name as ASN-900P.

Figure 56. Installation of the (power + data) Ethernet cable to the ETH-1 port of the FlexNET unit (ASN-900P).

6. To connect the FlexNET unit to the network unit (NC, server or switch) install another Ethernet cable between the network unit and the "**IN**" port of the PSU-4. The "IN" port of the PSU-4 is illustrated in Figure 57 below.

Figure 57. Installation of the Ethernet cable to the "**IN**" port of the PSU-4.

Ethernet cable specifications

Maximum length of the Ethernet cable is 100 meters. The Ethernet cable must fulfill CAT5 category FTP outdoor cable specification.
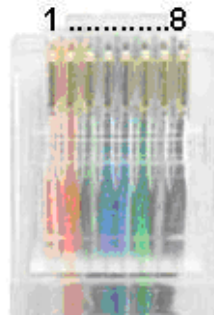
Figure 58. RJ-45 connector pin numbering

Ethernet cable between the BS and the HUB (switch)

pin number (borne numéro)	Color (Couleur)	Color (Couleur)
1	White/orange (Blanc/orange)	White/orange (Blanc/orange)
2	Orange (Orange)	Orange (Orange)
3	White/green (Blanc/vert)	White/green (Blanc/vert)
4	Blue (Bleu)	Blue (Bleu)
5	White/blue (Blanc/bleu)	White/blue (Blanc/bleu)
6	Green (Vert)	Green (Vert)
7	White/brown (Blanc/brun)	White/brown (Blanc/brun)
8	Brown (Brun)	Brown (Brun)

Table 1 Straight Trough Ethernet cable (Câble d'Ethernet de twisted pair)

Ethernet cable between the BS and the PC

pin number (borne numéro)	Color (Couleur)	Color (Couleur)
1	White/orange (Blanc/orange)	White/green (Blanc/vert)
2	Orange (Orange)	Green (Vert)
3	White/green (Blanc/vert)	White/orange (Blanc/orange)
4	Blue (Bleu)	Blue (Bleu)
5	White/blue (Blanc/bleu)	White/blue (Blanc/bleu)
6	Green (Vert)	Orange (Orange)
7	White/brown (Blanc/brun)	White/brown (Blanc/brun)
8	Brown (Brun)	Brown (Brun)

Table 2 Cross over Ethernet cable (Câble d'Ethernet de traverse)

Cable shield (Bouclier de câble)	S/STP, S/FTP, F/STP, STP, FTP (S=copper braid shield; F=foil)
Cable standard (Norme de câble)	CAT6, CAT5e, CAT5
Cable type (Type de câble)	4 x 2 x AWG24, halogen-free, double-jacketed, UV-resistant, -40 to +55°C compatible
RJ-45 connector type (type de connecteur)	Basic, Snagless Boot. **Note!** Moulded boot cannot be used in outdoor installations.

Table 3 Recommended Ethernet cable characteristics

APPENDIX E ALLOWED 5GHZ CHANNELS

Allowed 5 GHz frequency bands (Canaux permis bandes de fréquence dans de 5 gigahertz) The below list shows the country codes supported, It is always recommended that you check with your local governing body for possible changes in frequency use, and check are any licences needed for the wireless equipment.

Country		Country	
ALBANIA	5.15-5.8GHz	LITHUANIA	5.47 - 5.725 GHz
ARGENTINA	5.25 - 5.35 GHz and 5.725 - 5.825 GHz	LUXEMBOURG	5.47 - 5.725 GHz
AUSTRALIA	5.25 - 5.35 GHz and 5.725 - 5.825 GHz	MACAU	5.725 - 5.825 GHz
AUSTRIA	5.47 - 5.725 GHz	MALAYSIA	5.25 - 5.35 GHz and 5.725 - 5.85 GHz
AZERBAIJAN	5.47 - 5.725 GHz	MALTA	5.47 - 5.725 GHz
BELGIUM	5.47 - 5.725 GHz	MEXICO	5.725 - 5.85 GHz
BELIZE	5.725 - 5.85 GHz	NETHERLANDS	5.47 - 5.725 GHz
BOLVIA	5.725 - 5.85 GHz	NEW_ZEALAND	5.725 - 5.85 GHz
BRAZIL	5.47 - 5.725GHz	NORWAY	5.47 - 5.725 GHz
Brazil 5.8 GHz(B1)	5.725 - 5.85 GHz	PANAMA	5.25 - 5.35 GHz and 5.725 - 5.85 GHz
BRUNEI DARUSSALAM	5.725.5.85Ghz	PHILIPPINES	5.25 - 5.35 GHz and 5.725 - 5.85 GHz
BULGARIA	5.47 - 5.725 GHz	POLAND	5.47 - 5.725 GHz
CANADA	5.725 - 5.85 GHz	Poland 2	5.875-5.925 GHz
Canada DFS(C1)	5.25 - 5.35 GHz and 5.47 - 5.725 GHz	PORTUGAL	5.47 - 5.725 GHz
CHINA	5.725 - 5.85 GHz	PUERTO_RICO	5.25 - 5.35 GHz and 5.725 - 5.85 GHz
COLOMBIA	5.25 - 5.35 GHz and 5.725 - 5.85 GHz	RUSSIA	5.15 - 6.08 GHz
COSTA RICA	5.47 - 5.725 GHz	SAUDIA ARABIA	5.15 - 5.35 GHz and 5.725 - 5.825 GHz
CYPRUS	5.47 - 5.725 GHz	SINGAPORE	5.15 - 5.25 GHz and 5.725 - 5.85 GHz
CZECH REPUBLIC	5.47 - 5.725 GHz	SLOVAK REPUBLIC	5.47 - 5.725 GHz
DENMARK	5.47 - 5.725 GHz	SLOVENIA	5.47 - 5.725 GHz
DOMINICAN REPUBLIC	5.25 - 5.35 GHz and 5.725 - 5.85	SOUTH AFRICA	5.47 - 5.725 GHz

	GHz		
ESTONIA	5.47 - 5.725 GHz	SPAIN	5.47 - 5.725 GHz
FINLAND	5.47 - 5.725 GHz	SWEDEN	5.47 - 5.725 GHz
FRANCE	5.47 - 5.725 GHz	SWITZERLAND	5.47 - 5.725 GHz
GERMANY	5.47 - 5.725 GHz	TAIWAN	5.25 - 5.35 GHz and 5.725 - 5.825 GHz
GERMANY 2	5.755GHz–5875GHz	THAILAND	5.725 - 5.825 GHz
GREECE	5.47 - 5.725 GHz	UNITED KINGDOM	5.725 - 5.85 GHz
GUATEMALA	5.25 - 5.35 GHz and 5.725 - 5.85 GHz	UNITED_KINGDOM 2	5.47 - 5.725 GHz
HONG KONG	5.725 - 5.85 GHz	UNITED_STATES	5.725 - 5.85 GHz
HUNGARY	5.47 - 5.725 GHz	UNITED_STATES	5.25 - 5.35 GHz and 5.47 - 5.725 GHz
ICELAND	5.47 - 5.725 GHz	URUGUAY	5.725 - 5.825 GHz
INDIA	5.15 - 5.35 GHz and 5.725 - 5.870 GHz	VENEZUELA	5.725 - 5.825 GHz
IRAN	5.725 - 5.85 GHz		
IRELAND	5.47 - 5.725 GHz		
Ireland 5.8 GHz(I1)	5.725 - 5.85 GHz		
ITALY	5.47 - 5.725 GHz		
NORTH KOREA	5.725 - 5.85 GHz		
KOREA_ROK	5.725 - 5.825 GHz		
KOREA REPUBLIC2	5.725 - 5.825 GHz		
LATVIA	5.47 - 5.725 GHz		
LIECHTENSTEIN	5.47 - 5.725 GHz		

Appendix F Allowed Transmit Power levels:

The ASN900 is permitted to operate as follows:

For Point-to-point operation the operator of the spread spectrum intentional radiator or, if the equipment is professionally installed, the installer is responsible for ensuring that the system is used exclusively for fixed, point-to-point operations.

Allowed transmit power levels and radio/antenna combinations with AIRSPAN FCC/IC-Canada products (Laissé transmettez les niveaux de puissance, et les combinaisons de radio/d'antenne avec des produits de AIRSPAN FCC/IC-Canada)

The table below applies to model ASN-900PFCC-N with FCC ID:URK-ASN900 and IC:4548D-ASN900

Application	Radios	Frequency area (GHz)	Radio unit transmit power levels (dBm)	Antennas	Max configurable transmit power levels EIRP
Point-to-Multipoint link	2 x IEEE 802.11a	5.725 – 5.850GHz (5 channels)	9…20dBm	External omni 9.0dBi / 50Ω	29.0 dBm
Point-to-Point link	2 x IEEE 802.11a	5.725 – 5.850GHz (5 channels)	1....10 dBm	Integral Panel 23dBi / 50Ω	33.0 dBm
Point-to-Point link	2 x IEEE 802.11a	5.725 – 5.850GHz (5 channels)	1....10 dBm	External Panel 22dBi / 50Ω	32.0 dBm
Client access	2 x IEEE 802.11b	2412-2462 (11 channels)	9…18 dBm	External omni 6.0dBi / 50Ω	24.0 dBm
	2 x IEEE 802.11g	2412-2457 (10 channels)	9…17 dBm	External omni 6.0dBi / 50Ω	23.0 dBm
		2462 (1 channel)	9.....13 dBm	External omni 6.0dBi / 50Ω	19.0 dBm

The unit may also be combined using one 802.11a radio and one 802.11b/g radio provided that the above maximum permitted transmit power and antenna gains are followed.

This radio transmitter IC:4548D-ASN900, has been approved by Industry Canada to operate with the antenna types listed above with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

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