



SYN-UG-018 Revision A0 (draft ver. c)

**AirSynergy3
Equipment
Installation Guide**



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1 About this Guide

This section discusses the purpose, intended audience, conventions, referenced documentation and organisation for this guide.

1.1 Purpose

This guide provides the workflow and step-by-step procedures for Installation of the AirSynergy equipment. These procedures include:






- Verify Prerequisites
- Install the AirSynergy3 Radio equipment
- Install the PSU equipment
- Connect and manage cables
- Commission and discover via Netspan, to be ready for full configuration

1.2 Intended Audience

This guide is intended for persons who are responsible for installing AirSynergy equipment. These persons should have a working knowledge of the equipment.

1.3 Conventions

This document uses the following informational conventions.

Icon	Description
	Checkpoint: Marks a point in the workflow where there may be an exit or branch to some other procedure. At each Checkpoint the reason for an exit or branch is given along with specific directions to locate the entry point in the other procedure.
	Reference: Gives a resource in the workflow that may be needed to complete a procedure along with specific directions to use the resource.
	Caution: Describes a possible risk and how to lessen or avoid the risk.
	Advice: Provides a recommendation based on best practice.
	Note: Provides useful information.

1.4 Referenced Documentation

Place holder for Product Bulletins and other related documents

1.5 Organisation of this Guide

This guide is organised into the following Sections:

- About this Guide
- Introduction
- Get Started
- Verify Prerequisites
- Install the AirSynergy Radio equipment
- Install the PSU equipment
- Connect and manage cables
- Set BS Management IP & BSID via Web Page
- Connect and manage cables
- Appendixes

2 Introduction

This section provides a descriptive overview of the product.

2.1 General Overview for use with External Antenna

AirSynergy equipment comes in a range of frequency variants that can be mounted with different antenna options and formats.



Figure 1 – Typical AirSynergy with sun shield

2.1.1 Front Mounted Sector Antenna Arrangement

A typical sector installation will have a cross-polar sector antenna fitted directly to the front of the AirSynergy main unit. (This is fitted instead of the sun-shield).

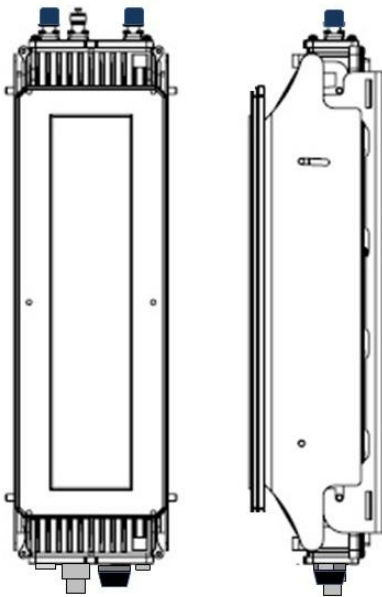


Figure 2 – AirSynergy with front sector antenna fitted

2.1.2 Switched Beam Antenna Arrangement

A switched beam antenna version (factory built option) with built in GPS antenna allows for flexible iBridge backhaul functionality where the strongest signal from any direction is automatically selected. The same antenna can also be configured in omni mode for the support of access.



Figure 3– AirSynergy with Switched Beam Antenna

2.1.3 Dual radio unit arrangement

AirSynergy units may also be supplied in a dual radio arrangement. *Note: Various antenna options can be selected for each AirSynergy to perform the required combination of backhaul and access functionality. An extended sun-shield is also available for this format.*



Figure 4 – AirSynergy dual radio configuration

Getting Started

2.2 Workflow of Installation

The workflow required to install the AirSynergy equipment is shown in the following diagram:

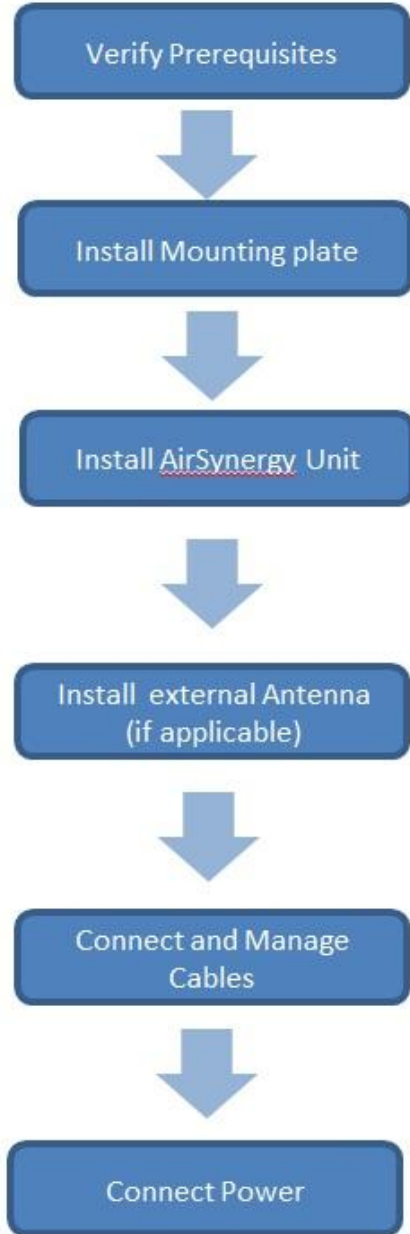


Figure 5 – Workflow of AirSynergy Installation

2.3 Installation Checklist

Plan the installation of the AirSynergy Unit by using the Installation Checklist in Appendix A

2.4 Verify Site Requirements

To set up the AirSynergy a connection to a Netspan server PC will be required.

2.5 Verify Safety Requirements

Read and follow all warning notices and instructions marked on the product or included in this manual.

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.

Ascertain the radiation hazards when working in an environment close to other antennas and Electromagnetic fields, e.g. working on towers with other microwave transmitters etc. and act accordingly.

2.5.1 Warning of Hazardous Voltages

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

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



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



Caution: Any modifications to this device not expressly authorised by the manufacturer could void the users' authority to operate this device.

2.5.2 Adhere to European Directive 1999/519/EC

European Council Recommendation 1999/519/EC 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.

2.6 Verify Installation Requirements

2.6.1 Verify the Tools

Table 1 – AirSynergy3 installation tools

Tools
Small flat blade Screwdriver (For screw terminals inside power cable joiner)
Large Flat Bladed Screwdriver (Securing of the pole straps)
Medium Cross-head Screwdriver (Power supply covers/mounting screws mounting screws)
13mm wrench x 2 (Heavy-duty pole clamp option only)
10mm wrench (AirSynergy securing flange nuts)
Large pliers (Tightening cable glands on the US PSU - To fit 15mm across flats)
Knife (for stripping back insulation)
Wire cutters
Wire strippers (Cutting insulation)
Ring terminals crimp tool
Tilt-meter (If accurate downtilt of antenna needs to be set)

2.6.2 Verify the Parts and Kits

Table 2 – AirSynergy3 installation parts and kits

Installation Kit / Part:	Installation Kit details	Note:
Main AirSynergy parts	1 x AirSynergy Universal Mounting Plate and pole strap kit	(Includes 2 pole straps for poles up to 200mm diameter)
	AirSynergy unit(s)	Frequency band specific and available with and without integral switched beam antenna. Check against order and requirement to ensure the correct unit type to be installed
	Either of the following:	
	1 x Sun Shield (for single unit installation where a separately mounted external antenna is deployed)	Sun shield 6 Countersunk head fixing screws
	OR (for front mount antenna option)	
	1 x Sector Antenna mounting plate with fixing kit	4 M4 nuts 4 M4 flat washers 4 M4 spring washers 4 Cable ties 4 M5 SEM
	1 x Sector Antenna (front mounting)	
	Additionally required for any non-switched beam antenna versions of AirSynergy	
	GPS Antenna	
	GPS Antenna mounting kit	Bracket M6 screw M6 plain washer M6 spring washer TNC to TNC cable (25cm)

	<p>Additionally required for back to back unit installations. <i>Note: Dual radio Synergy3 units in most cases pre-assembled from the factory</i></p>	
	1 x back to back joining kit	4 joining straps with mounting studs and flange nuts pre-fitted. 16 M5 countersink screws
	1 x Extended sun shield (If no front mount antenna is to be fitted to the front face of the back to back AirSynergy units)	
OPTIONAL Heavy-duty mounting (for specific mounting locations)	1 heavy-duty pole clamp mounting kit	4 clamps 4 M8x150 bolts 4 M8 plain washer 4 M8 spring washer
Connecting cables	CAT5e	External grade 30m with Synergy3 compatible RJ45 connector weather hood pre-fitted. One for each AirSynergy unit unless iBridge backhaul invoked
	Earthing cable	M6 Lug at each end (for the
Power Supply and power cable	48V PSU module	1 per AirSynergy unit (or dual radio unit)
	Power drop cable	1 per AirSynergy unit (or dual radio unit) with external grade 30m power cable with Synergy3 compatible power connector weather hood pre-fitted.
	Cable join kit	1 per AirSynergy unit (or dual radio unit)
	48V PSU in weatherproof enclosure (NEMA approved)	Alternative to the standard 48V PSU and is required for all North American installations

Table 3 – External Antenna and feeder kits (OPTION)

Installation Kit / Part	Note
External Antenna	Typically a 2 port cross-polar antenna
<i>Many variants - Check against order and requirement to ensure the correct type is installed</i>	Pole mounting kits (supplied with antenna)
Short Feeder cable	0.5M feeder tails x 2 (Suitable for mounting antenna directly above the AirSynergy unit)
Long Feeder tail	1.5M feeder tails x2 (Suitable for mounting antenna on the same pole immediately behind the AirSynergy unit or where the Antenna needs to be spaced away from the AirSynergy unit)

Table 4 - AirSynergy additional (consumable) items

Additional items (not provided by Airspan)
Cable ties
Self-amalgamating tape
Black PVC tape
Ring terminals for earth strap, M6
Earth strap cable (4mm), yellow and green cable

2.6.3 Verify Components

The following figures show and describe the AirSynergy components and accessory kits

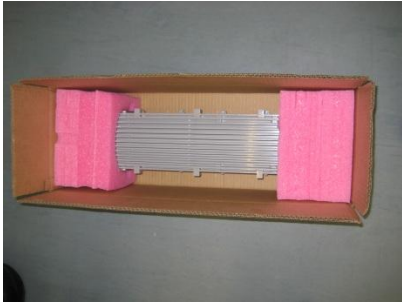


Figure 6 – AirSynergy unit in typical packing box as supplied with foam inserts



Figure 7 – Single radio AirSynergy unit (connectorised)



Figure 8 – Dual Radio Synergy (Can be any combination of 2 x connectorised or 1 x connectorised and 1 with SBA)



Figure 9 – Single radio AirSynergy unit with Switched Beam Antenna (factory fitted)

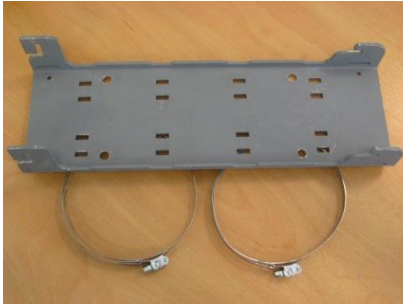


Figure 10 – Universal Mounting Plate and pole straps



Figure 11 – Sun Shield with fixings



Figure 12 – Sector Antenna Mounting plate and fixings



Figure 13 – Sector Antenna (Check frequency variants)



Figure 14 – PSU



Figure 15 – Enclosed PSU (US requirement)



Figure 16 – GPS antenna



Figure 17 – GPS antenna mounting kit

3 Installing AirSynergy

3.1 Mount the AirSynergy Universal Mounting Plate

The AirSynergy is normally mounted on a pole (in close proximity to its external antenna if not using the AirSynergy front mounted Antenna. Take care to install the mounting plate the correct way up so that the AirSynergy unit will fit with the PoE connector pointing downwards. This is with the slot openings in the bracket at the top edges as shown.

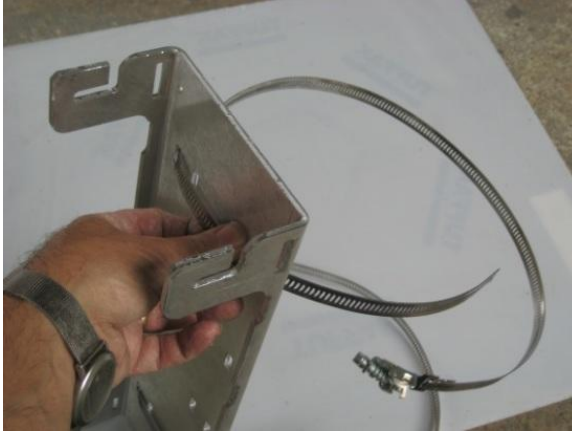


Figure 18 – AirSynergy mounting plate and fixings



Figure 19 – Feed clamp bands through the quick release locking mechanisms



Figure 20 – Press down the locking mechanism with the slack band fed through



Figure 21 – Tighten clamps with large flat blade screwdriver



Figure 22 – AirSynergy mounting plate installed (large diameter concrete pole)

3.2 Fit Front Sector Antenna to AirSynergy

The AirSynergy unit can be used either with a sector antenna mounted directly on the front or with a remotely attached RF antenna. This document describes the installation procedure for the front mount antenna (2.x and 3.xGHz bands. For the installation of separate antennas follow the antenna manufacturer's instructions and connect to the AirSynergy using suitable feeder cable tails. (N-Type RF connections should all be weather-proofed). For details for other frequency front mountable antenna variants and front antenna mounting arrangements for double radio units please contact Airspan Product Line Management)

In all cases where a front mount antenna is not fitted a sun shield should be fitted.

To mount the front antenna, perform the following steps:

3.2.1 Fit the antenna to the mounting plate. The 4 studs on the back of the antenna pass through the holes on the front face of the mounting plate and secure into position with the 4 sets of M4 nuts and washers (plain + spring) provided in the kit. Carefully position the flying lead RF cables as shown in Figure 20 and secure in place to the eyelets in the back of the mounting plate with cable ties (provided). The cables are formed with a cross-over at the bottom



Note: It is recommended to place some cardboard or paper under the unit to protect it from scratching.



Figure 23 – Fixing the front mount antenna to the mounting plate

3.2.2 Fit the assembled antenna and mounting plate to the AirSynergy unit using the M5 SEMs (2 each side) and connect the RF cables to the N type RF ports at the top of the AirSynergy.

Note: the plate is mounted with the side slots to the top so that the required down-tilt can be set.



Figure 24 –Fitting the Front mount antenna assembly to AirSynergy

3.3 Fit GPS Antenna to AirSynergy



Note: AirSynergy units without a factory fitted Switched Beam Antenna all require a GPS antenna which comes in a kit with a mounting bracket and a 25cm cable. A prime consideration for a GPS antenna is a clear view of the sky, preferably 360 degrees

3.3.1 Fit the GPS antenna to the mounting bracket supplied in the GPS antenna mounting kit. The large back nut should be tightened with a pipe wrench. Take care not to over tighten on the plastic threads.



Figure 25 –Fitting the GPS antenna to the mounting bracket

3.3.2 Fit the short TNC to TNC cable from the GPS antenna to the TNC connector on the top of the AirSynergy

Note: For extreme weather conditions weather-proofing of the TNC connections is recommended. This is done with a layer of self-amalgamating tape followed by an over layer of PVC tape. The weather-proofing is best done at this stage to give easier access to the connections



Figure 26 –GPS antenna cable connected

3.3.3 Fit the GPS antenna assembly to the body of the AirSynergy using the single M6 screw and lock washer provided in the kit. There is a threaded hole at the top corner of the AirSynergy unit for this purpose. The TNC to TNC cable loop can be gently positioned behind the front mount antenna (or

sunshield) as shown in Figure 24. Weather-proofing tapes (self-amalgamating followed by a layer of black PVC tape) should be applied to the TNC connections.



Figure 27 – Assembling the GPS antenna and bracket assembly to AirSynergy

3.4 Secure AirSynergy and Antenna to pole mount plate

To mount AirSynergy to the universal mounting plate, perform the following steps:

NOTE: If the installation is for a back to back arrangement with 2 AirSynergy units sharing the same mounting bracket refer to additional step in APPENDIX B.

- 3.4.1 Hook the studs into the top slots of the mounting plate. With the studs engaged in the top slots raise the unit slightly until the bottom studs also drop into their respective slots. Secure the flange nuts (4 positions) with the require degree of down-tilt.
- 3.4.2 Follow the Figure sequence from Figure 25 to Figure 28 for the positioning of the AirSynergy into the mounting bracket slots.



Figure 28 – Lift AirSynergy to top of pole-mount plate



Figure 29 – AirSynergy drops down into slots at the top of pole-mount plate



Figure 30 – Gently lift the AirSynergy body until the bottom studs engage in the bottom slots



Figure 31 – AirSynergy body engaged in the bottom slots

3.4.3 The slot arrangement at the top of the mounting bracket allows the AirSynergy and front mounted antenna to be down-tilted by a few degrees or can be used to compensate for the taper angle or tilt of the actual mounting pole. With the flange nuts gently hand tightened, the position can be accurately set with tilt-meter on the front face of the AirSynergy unit.



Figure 32 – AirSynergy downtilt adjustment

3.4.4 The down-tilt angles are not marked by the adjustment slots so a tilt-meter is required to set a specific angle, the flange nuts can then be tightened with a 10mm wrench on each stud (4 positions)



Figure 33 – Tighten flange nuts (4 positions) once the required mounting angle is set

4 Connect and Manage cables

4.1 Fitting the Protection earth cable

4.1.1 There is an option to connect an earthing cable to the M6 screw fixing point at the bottom of the main body casting. This should be connected to a protection ground bar or clamped directly to the steel structure of the power or pole. This is required in areas of high lightning activity or when the AirSynergy unit is mounted on high exposed roofs or tower structures. A direct earth connection is required for the surge protection devices inside the AirSynergy to be effective.



Figure 34– AirSynergy attachment of earthing cable

4.1.2 Connect the earth cable to the protection earth bar using suitable crimp lugs. Alternatively use a clamp to join the earth cable to the steel structure of the mounting pole or tower structure.

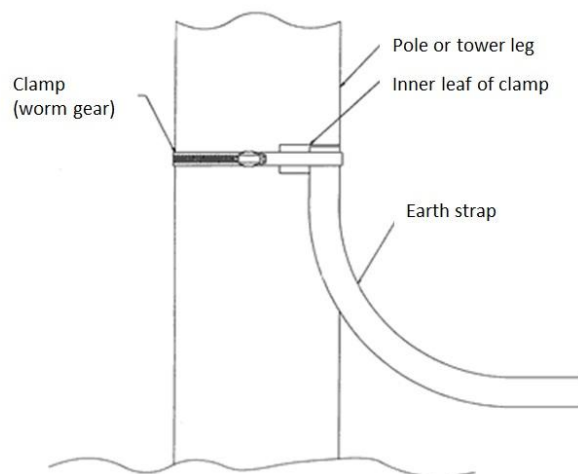


Figure 35– Attach earth cable to pole

Note: When installing a protection earth take care to use suitable metal combinations to avoid or minimize galvanic corrosion. Combinations above the line in the table below should be avoided

Magnesium, magnesium alloys	Zinc, zinc alloys	80 tin/20 Zn on steel, Zn on iron or steel	Aluminium	Cd on steel	Al/Mg alloy	Mild steel	Duralumin	Lead	Cr on steel, soft solder	Cr on Ni on steel, tin on steel 12 % Cr stainless steel	High Cr stainless steel	Copper, copper alloys	Silver solder, Austenitic stainless steel	Ni on steel	Silver	Rh on Ag on Cu, silver/gold alloy	Carbon	Gold, platinum	
0	0,5	0,55	0,7	0,8	0,85	0,9	1,0	1,05	1,1	1,15	1,25	1,35	1,4	1,45	1,6	1,65	1,7	1,75	Magnesium, magnesium alloys
0	0,05	0,2	0,3	0,35	0,4	0,5	0,55	0,6	0,65	0,75	0,85	0,9	0,95	1,1	1,15	1,2	1,25		Zinc, zinc alloys
0	0,15	0,25	0,3	0,35	0,45	0,5	0,5	0,6	0,7	0,8	0,85	0,9	1,05	1,1	1,15	1,2			80 tin/20 Zn on steel, Zn on iron or steel
0	0,1	0,15	0,2	0,3	0,35	0,4	0,45	0,55	0,65	0,7	0,75	0,9	0,95	1,0	1,05				Aluminium
0	0,05	0,1	0,2	0,25	0,3	0,35	0,45	0,55	0,6	0,65	0,7	0,75	0,8	0,85	0,9	0,95			Cd on steel
Ag	Silver	0	0,05	0,15	0,2	0,2	0,3	0,4	0,5	0,55	0,6	0,75	0,8	0,85	0,9				Al/Mg alloy
Al	Aluminium	0	0,1	0,15	0,2	0,25	0,35	0,45	0,5	0,55	0,7	0,75	0,8	0,85					Mild steel
Cd	Cadmium	0	0,1	0,15	0,2	0,25	0,35	0,45	0,5	0,55	0,7	0,75	0,8	0,85					Mild steel
Cr	Chromium	0	0,05	0,1	0,15	0,25	0,35	0,4	0,45	0,6	0,65	0,7	0,75						Duralumin
Cu	Copper	0	0,05	0,1	0,15	0,25	0,35	0,4	0,45	0,6	0,65	0,7	0,75						Duralumin
Mg	Magnesium	0	0,5	0,1	0,2	0,3	0,35	0,4	0,55	0,6	0,66	0,7							Lead
Ni	Nickel	0	0,05	0,15	0,25	0,3	0,35	0,5	0,55	0,6	0,65								Cr on steel, soft solder
Rh	Rhodium	0	0,05	0,15	0,25	0,3	0,35	0,5	0,55	0,6	0,65								Cr on Ni on steel, tin on steel 12 % Cr stainless steel
Zn	Zinc	0	0,1	0,2	0,25	0,3	0,35	0,4	0,45	0,5	0,55	0,6							Cr on Ni on steel, tin on steel 12 % Cr stainless steel
		0	0,1	0,15	0,2	0,35	0,4	0,45	0,5										High Cr stainless steel
		0	0,05	0,1	0,25	0,3	0,35	0,4											Copper, copper alloys
		0	0,15	0,2	0,25	0,3	0,35												Silver solder, Austenitic stainless steel
		0	0,15	0,2	0,25	0,3													Ni on steel
		0	0,5	0,1	0,15														Silver
		0	0,05	0,1															Rh on Ag on Cu, silver/gold alloy
		0	0,5																Carbon
		0																	Gold, platinum

NOTE Corrosion due to electrochemical action between dissimilar metals that are in contact is minimized if the combined electrochemical potential is below about 0,6 V. In the table the combined electrochemical potentials are listed for a number of pairs of metals in common use; combinations above the dividing line should be avoided.



4.2 Connecting RF Jumper cables to External Antenna



Figure 36 – Connecting the antenna RF cables



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

Weather-proofing of the RF N type connectors with weather-proofing tapes. (self -amalgamating followed by a layer of black PVC tape.



Figure 37 – AirSynergy Front mount antenna connections – applying self -amalgamating tape

Apply a layer of self-amalgamating tape and a layer of black electrical tape to the weather-exposed RF connector.



Figure 38 – AirSynergy antenna connections – applying PVC tape

Ensure the RF connector is completely sealed from the weather.

4.3 Connect Power drop cable to the AirSynergy

4.3.1 Plan the position of the drop cable run from the AirSynergy unit to the Power supply. The standard cable supplied provides for a run length of 30m. (For run lengths greater than 30m please consult Airspan Product Management).

Uncoil the cable and secure with the connector hood just below the AirSynergy unit. When securing the cable, make sure that there is no tension on the connector so that it is easy to disconnect and re-connect for maintenance activities in the future. With the pins correctly located, the connector is secured to the unit with a locking ring that is screwed into place. Use firm hand pressure only, the connector has a built in sealing ring.



Caution: The internal plastic parts of the mating connector are keyed. Take care to align these by visual inspection or by gently rotating the connector body until the key way sections align and the pins go in before tightening the locking ring.



Figure 39 – Attach the power cable to the AirSynergy

5 Power System Connection



Caution: Hazardous voltage! Before working, ensure that the power is removed from the power connection cables. When the system is powered on, **do not touch the power terminals.**

Tools Required: The tools required for the connection of the PSU are: knife, small flat blade screw driver (electrical insulated shaft recommended), medium cross-head screw driver, pliers, small side cutters, tweezers (or fine blade long nose pliers)



Figure 40 – Tools required to connect the PSU

5.1 Run cables from the PSU to the AirSynergy

5.1.1 The drop cable installation. If the drop cable is to be passed through glands and/or down the centre of a lamp post or other structure, the drop cable can be cut leaving sufficient length for ease of termination. **(The typical cable supplied is 30m in length and other length options are available)** With the power supply placed at the selected installation location, trim the cable to the length for neat installation while allowing sufficient length to strip and prepare the cable ends.



Note: It is good practice to label both ends of the drop cable to identify which AirSynergy unit it is connected to. This is especially important where multiple AirSynergy units are installed on the same pole/tower.



Note: It is good practice to leave a spare loop of drop cable (approximately 0.5m of cable). This will allow for ease of wiring to the power supply and will allow the cable to be re-terminated if necessary in the future.

5.1.2 The Network cable. For installations that require a network connection a separate cable must be run to the network Ethernet switch. The standard length of pre-made cable with the weather hood fitted is 30m. For other lengths up to a maximum of 100m cables can be made up on site by fitting the weather hood over the end of the cable before fitting an RJ45 connector.



Note: It is good practice to leave a spare loop of network cable (approximately 0.5m of cable). This will allow for ease of wiring to the Network switch and will allow the cable to be re-terminated if necessary in the future.



Note: It is good practice to label the network connection cable to identify which AirSynergy unit it is connected to. This is especially important where multiple AirSynergy units are installed on the same pole/tower and the network connections all converge on one Ethernet switch.

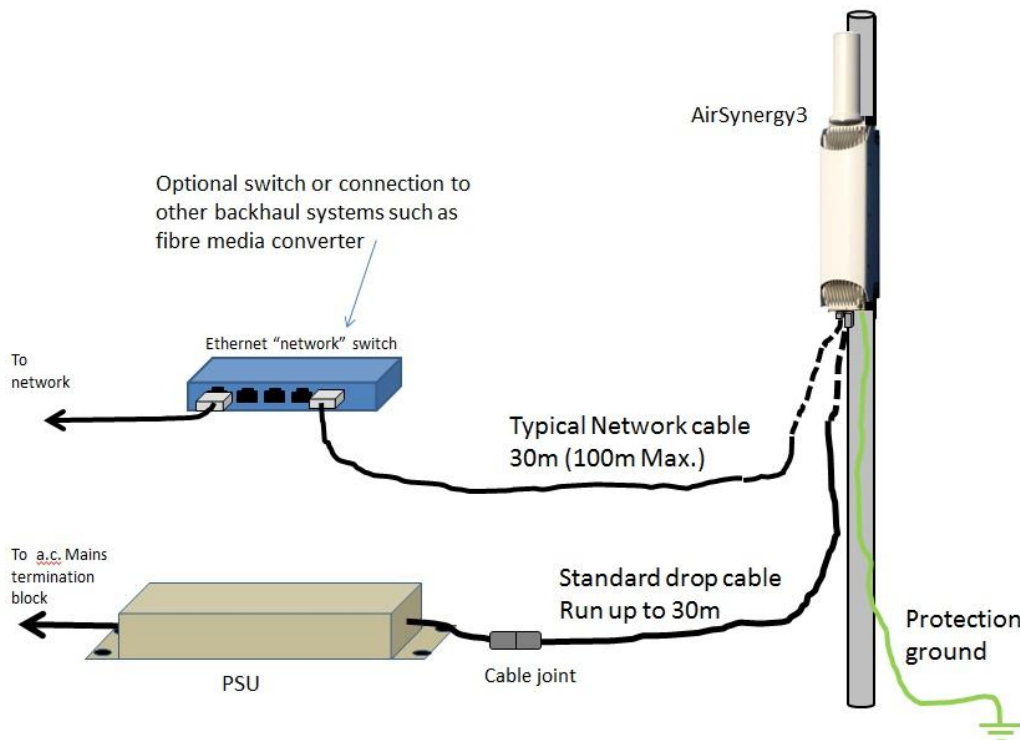


Figure 41 – AirSynergy3 power and network cable overview diagram

5.2 Wiring of the Drop cable to the power supply unit

5.2.1 The power drop cable comes in a standard 30m length with the power connector for the Synergy3 unit pre-fitted. (Longer lengths are available). Choose the location PSU and the route of the drop cable. Feed the cable through any building walls or cable entry glands and bring the unterminated end to the selected location of the PSU.

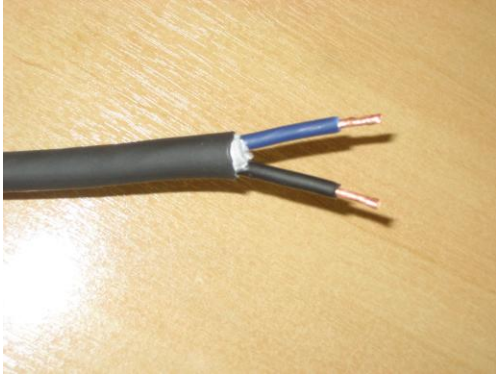


Figure 42 – Preparing the end of the drop cable

5.2.2 With the drop cable from the AirSynergy cut to the required length prepare the cable to fit the waterproof power connector. Strip back and remove the outer sheath to expose the inner blue and black insulated wires to a length of 3cm. Then strip back 6mm of the inner core insulation.



Figure 43 – Water proof power connector with the 2 halves separated



Figure 44 – Waterproof connector dis-assembled ready for installation on the cables



Figure 45 – Cable gland and connector body positioned on the drop cable.

5.2.3 Thread the prepared cable end through the gland, washer, sealing ring and body of the connector



Figure 46 – Fit the cable ends into the connector and secure

5.2.4 Secure the prepared ends of the drop cable into the head part of the connector (The male part with pins visible). The connection scheme follows:

Drop cable black – position 1 (in male connector part)

Drop cable blue – position 2 (in male connector part)



Figure 47 – Male part of connector with both drop cable wires fitted

Note: The individual connection numbers are marked on each part of the connector



Figure 48 – Connector contact position markings



Figure 49 – Assemble the connector and tighten the gland

5.2.5 Assemble the parts of the connector and tighten the gland to provide a waterproof seal.



Figure 50 – Prepare the ends of the PSU cable and thread the connector part over the cable

5.2.6 Prepare the ends of the PSU low voltage cable and thread the connector parts over the cable.

Secure the prepared ends of the drop cable into the head part of the connector (The female part).
The connection scheme follows:

PSU cable red – position 1 (in the female connector part)

PSU cable black – position 2 (in the female connector part)

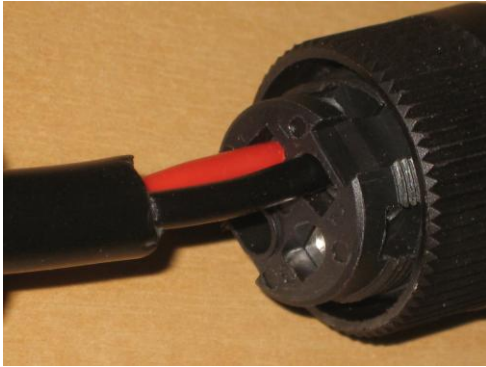


Figure 51 – Female part of connector with both PSU cable wires fitted

5.2.7 Assemble the parts of the connector and tighten the gland to provide a waterproof seal.



Figure 52 – Assemble the connector and tighten the sealing gland

5.2.8 Join the 2 parts of the connector together and tighten to make a watertight seal



Figure 53 – Connector parts joined together

5.3 Connecting the PSU to Mains

NOTE: For USA deployments an alternative PSU and enclosure arrangement is required – Refer to Appendix E



Figure 54 - High power (240W) PSU showing the Mains and low voltage connections



Figure 55 – Standard power (100W) PSU

5.3.1 The mains connection should be connected to a fused or protected mains supply (100 to 240Volts AC). The Brown wire is mains Live, The Blue wire is mains Neutral and the Green/Yellow wire is the protective earth.



Figure 56 – Fix the PSU into position using self tapping screws

5.4.3 The PSU module can be screwed into final position using the self-tapping screws provided into a suitable wooden or insulated backing board (4 positions)



Safety - Disconnection of AC supply

- Where Airsynergy is connected directly to building or lamp post wiring a suitably rated and readily accessible disconnect device shall be incorporated external to the equipment;
- Where Airsynergy is connected to the ac mains supply using a plug and socket, the socket-outlet shall be installed near the equipment and shall be easily accessible.

Set BS Management IP & BSID via Web Page

The following are the steps to the BS via its WEB interface.

Ensure that your Web browser with which you want to access the Web-based Management is active.

To connect to AirSynergy via the WEB interface:

1. Open web browser and type the BS address.
 IP address – 192.168.0.100 (255.255.255.0)
 User name – synergy
 Password – synergy
2. Click **Submit**
3. For WiMAX 16e applications Navigate to “General” menu to specify the BS ID. (**Format xxxxxx:yyyyyy**)

Where xxxxxx is reserved for the Operator ID and yyyyyy is a unique Hexadecimal reference number within the network. The commissioning details vary for iBridge and LTE applications and these are covered in separate commission documents

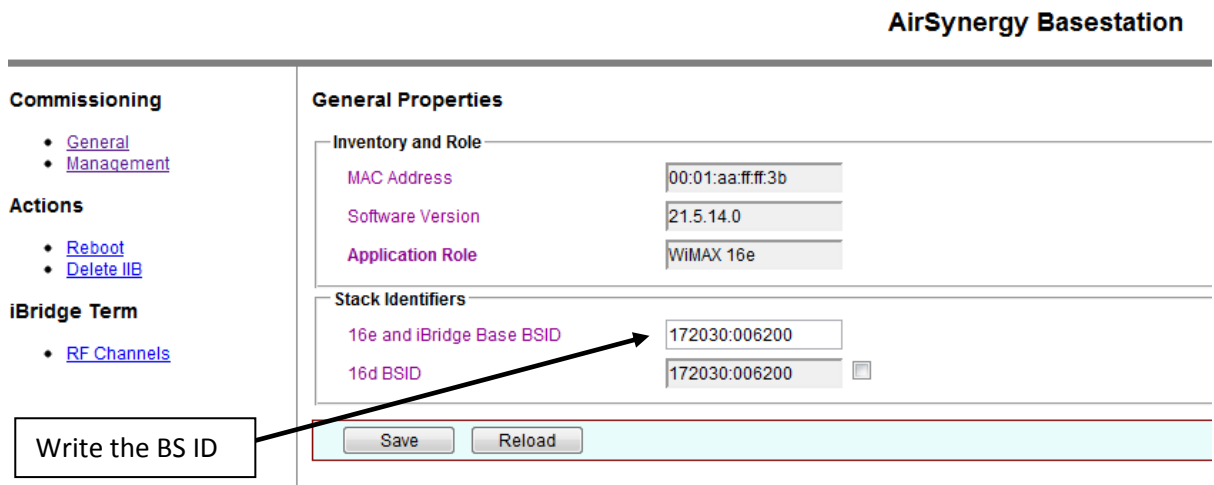


Figure 57- BS Config

4. Click **Save**.



Note: iBridge Term menu item is not applicable to 16e BS and must not be used. Configuration of “RF Channels” may lead to failed installation (failed commissioning and no discovery). Configuration details for iBridge is covered in a separate document

5. Navigate to “Management” and modify the IP address according to your network.

Commissioning

- [General](#)
- [Management](#)

Actions

- [Reboot](#)
- [Delete IIB](#)

iBridge Term

- [RF Channels](#)

Management Configuration

External Port (eth0) Internal Port (iBridge Term only)

IP Configuration

IP Allocation: Static

IP Address: 172.30.6.200

Subnet Mask: 255.255.0.0

Default Gateway: 172.30.0.1

SNMP

Read Only Community: public

Read Write Community: private

SNMP Port - Application Agent: 161 Required for all application roles

SNMP Port - Board Agent: Used only in LTE and iBridge FT

Ethernet Port

Mode: Auto

Management VLAN

Tagging Behaviour: Tagged

VLAN ID: 100

Save Reload

Modify the BS IP

Choose Untagged or Modify the BS Management VLAN when applicable (Take care when changing to a management VLAN since communication from a Laptop or PC without the relevant 802.1Q NIC capability and configuration will be lost)

6. Click **Submit**

Note: Dynamic IP Allocation is not supported in the current release. Please select Static

Note: Internal Port configuration is not applicable to 16e BS and must not be used. Configuration of the internal port may lead to management comms failure.

Note: Clicking the “Submit” your configuration is NOT implemented immediately in the BS. The BS needs to be rebooted for the new configuration to be applied.

7. Navigate to “**Reboot**” and click on “Yes” to reboot the BS

AirSynergy Basestation

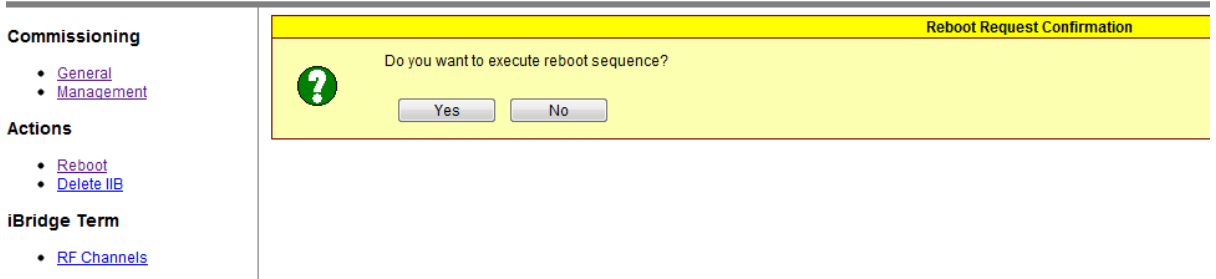


Figure 59- Reboot Confirmation

6 Automatic Discovery via Netspan

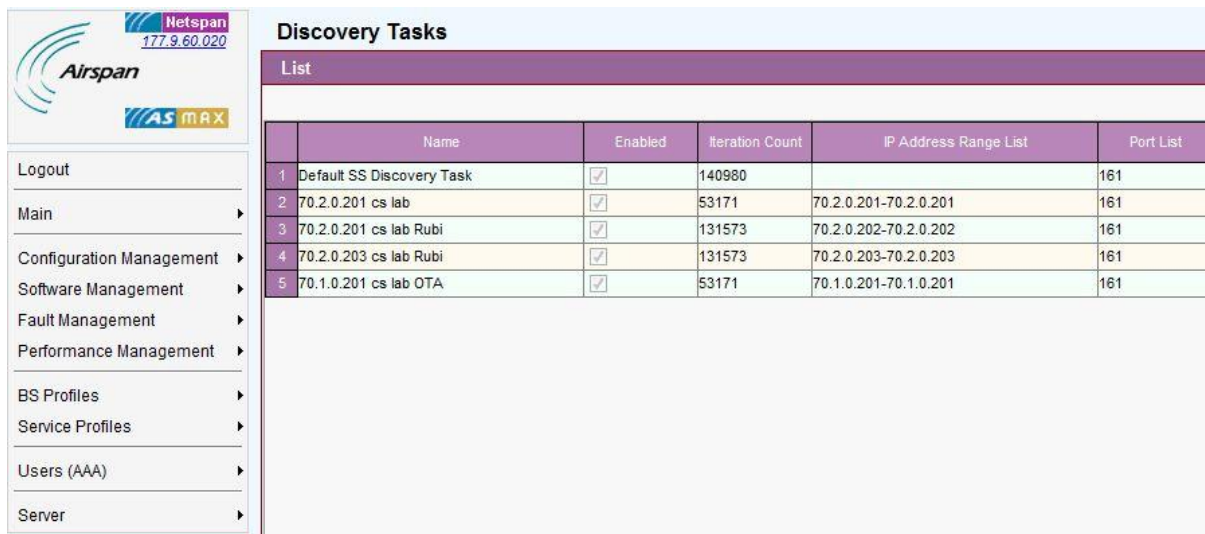
Set BS discovery profile in Netspan.

The following section explains the steps to take for the automatic discovery of AirSynergy via Netspan.

To connect to AirSynergy BS via Netspan

1. Login to Netspan
2. Navigate to **Server > Discovery Parameters**

The following is displayed:



Discovery Tasks					
List					
	Name	Enabled	Iteration Count	IP Address Range List	Port List
1	Default SS Discovery Task	<input checked="" type="checkbox"/>	140980		161
2	70.2.0.201 cs lab	<input checked="" type="checkbox"/>	53171	70.2.0.201-70.2.0.201	161
3	70.2.0.201 cs lab Rubi	<input checked="" type="checkbox"/>	131573	70.2.0.202-70.2.0.202	161
4	70.2.0.203 cs lab Rubi	<input checked="" type="checkbox"/>	131573	70.2.0.203-70.2.0.203	161
5	70.1.0.201 cs lab OTA	<input checked="" type="checkbox"/>	53171	70.1.0.201-70.1.0.201	161

Figure 60- Discovery Tasks

3. Click **Add**
4. Define:
 - a) Name.
 - b) Write Community.
 - c) Read Community

Note: This should be same as was configured before on the BS.

5. Define the discovery Target IP Address Range. For example – Start address = 172.30.0.100 and End Address=172.30.0.101
6. Port – enter 161
7. Click **OK**, as shown below:
- 8.

Add Discovery Task

General

Name

Discovery Type

Enabled

SNMP Properties

SNMP Timeout s Use Defaults

SNMP Version

Write Community

Read Community

+

IP Address And Ports

IP Addresses to

+

Ports

+

Discovery Test

Figure 61- Edit Discovery tasks parameters

- Click **OK** and wait till you see the new BS in the “ configuration management > BS > BS TRx, as shown below:


44		Kerwin	AirSynergy	16e BS	172.30.1.199	On Line	<input checked="" type="checkbox"/>
----	---	--------	------------	--------	--------------	---------	-------------------------------------

Figure 62 - Discovery Target

Your AirSynergy BS is now “discovered” by Netspan and is ready for additional configuration, provisioning and adaptations.

Note: In case of discovery failure (BS not present on the list) Discovery Test can be used to diagnose the problem. Select Discovery Task created and Click Edit. Select the discovery parameters and press Test. The report appears. Correct the problem and try again.

Edit Discovery Task Parameters

General

Name: Helsinki
 Discovery Type: Node
 Enabled:

SNMP Properties

SNMP Timeout: auto (5-15) s Use Defaults
 SNMP Version: Version 2C
 Write Community: private
 Read Community: public

IP Address And Ports

IP Addresses: 172.30.0.70 to 172.30.0.70 X
 172.30.99.98 to 172.30.99.98 X
 Ports: 161

Discovery Test

IP Address: 172.30.0.70

Details	Result
Valid MIB Probe Result	✓ True
SysObjectId	✓ 1.3.6.1.4.1.989.2.16.2
Node Type	✓ 16e BS
Node ID	✓ 172030:000070
Agent ID	✓ 172030:000070
Communication with Equipment	✓ Successful
Connection State	✓ On Line

Figure 63 - Discovery Test

7 Appendix A

7.1 Review Job Sheet

The *Job Sheet* should include the following information:

- Pole for installation identified
- Position on pole identified
- Pole access restrictions (highway regulations, other services on pole, power pole)
- Method of reaching pole positions (ladders, Elevated work platform)
- AC main fuseway available for PSU
- Configuration programming details known
- Point of connection for Ethernet (if applicable)
- All equipment items available at the installation site
 - Main AirSynergy unit
 - Mounting bracket and pole clamps
 - PSU
 - PoE injector (with fixing kit)
 - Ethernet cable assembly
 - GPS Antenna
 - GPS antenna installation kit
 - Front sector Antenna (if applicable)
 - Front sector Antenna mounting bracket and fixing kit (if applicable)
 - External panel antenna (if applicable)
 - RF feeder cable tails (if applicable)
- Required tools
 - Large flat screw driver for pole clamps
 - Small flat screwdriver for PoE power terminations
 - Small cross-head screwdriver for PoE box lid and fixings for PoE injector and PSU
 - 20mm wrench or small pipe wrench for RF connections
 - 10mm wrench for main unit mounting flange nuts
 - Side cutters
 - Wire strippers
 - Krone punch down tool
 - Tilt meter to set antenna downtilts
 - Ring terminals crimp tool
- Required ancillary equipment
 - Lap top PC for initial configuration
 - Ethernet cable for temporary connection of the lap top
- Other install materials
 - Self amalgamating
 - Black PVC tape
 - Cable ties
 - Labels
- Whether the system is required to be locked to a GPS timing reference.
- A BSID is required for each AirSynergy. This should be in a format xxxxxx:xxxxxx where x is a decimal digit.
- Network configuration information for the SDR blade. This shall include the following information for the front panel and the backplane.

IP Address: Should only be set if Management IP Mode is set to Static IP Address. See below for Management IP Mode parameter.



Netmask: Should only be set if Management IP Mode is set to Static IP Address. See below for Management IP Mode parameter.

Default Gateway: Should only be set if Management IP Mode is set to Static IP Address. See below for Management IP Mode parameter.

Management VLAN: Specified as either Untagged or Tagged

Management VLAN Tag: Should only be set if Management VLAN is set to Tagged

Management IP Mode: Specified as Static IP Address or Obtain IP Address via DHCP

Ethernet Mode: Specified as Auto-negotiate or Fixed

Ethernet Rate: Need only be configured if Ethernet Mode is set to Fixed, specified as 10M or 100M.

Ethernet Duplex: Need only be configured if Ethernet Mode is set to Fixed, specified as Full or Half.

- **SNMP configuration information.** This will allow events from the BS to arrive at the specified Netspan server. This will include the following information:

Read Only Community: This should be specified to the same value as in Netspan Discovery Parameters (found under Server on Netspan's left hand panel).

Read Write Community: This should be specified to the same value as in Netspan Discovery Parameters (found under "Server" on Netspan's left hand panel).

Community: Normally specified to the same value as for Read Only Community.

Appendix B – Field assembly of Back to back AirSynergy units

In cases where 2 AirSynergy radios are to be installed on the same mounting bracket some additional installation steps are required as follows:

Removal of the existing stud mounting plates (4 positions) from each AirSynergy unit. Each plate is secured with 2 countersunk head screws.



Figure 64 - Removing the existing stud mounting plates



Note: The screws should be replaced with a new set of 16 pieces with fresh locking patches on the threads when re-assembling with the joining plates. A new set of screws is supplied with the back to back joining kit.

Re-assembly with the joining plates. The studs with flange nuts must all be at the same end. A typical arrangement will be with the AirSynergy with connectorised RF ports to be mounted at the back. The mounting studs will then all be on the sides of the connectorised unit as shown in the figure. Fit all 4 plates to one of the AirSynergy units then slide the 2nd Synergy unit into place between the brackets.

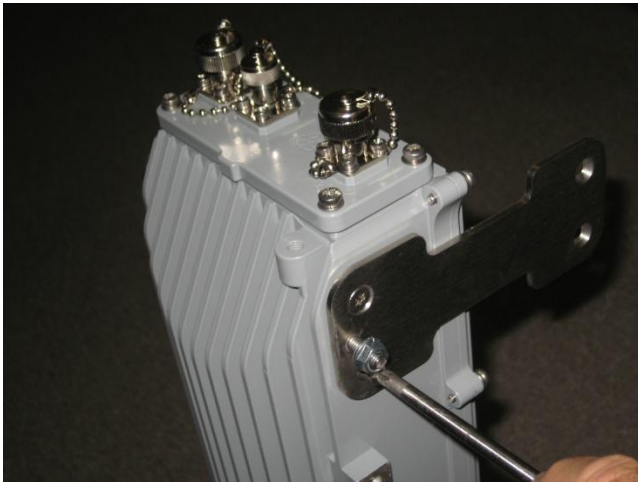


Figure 65 - Fitting the stud joining plates

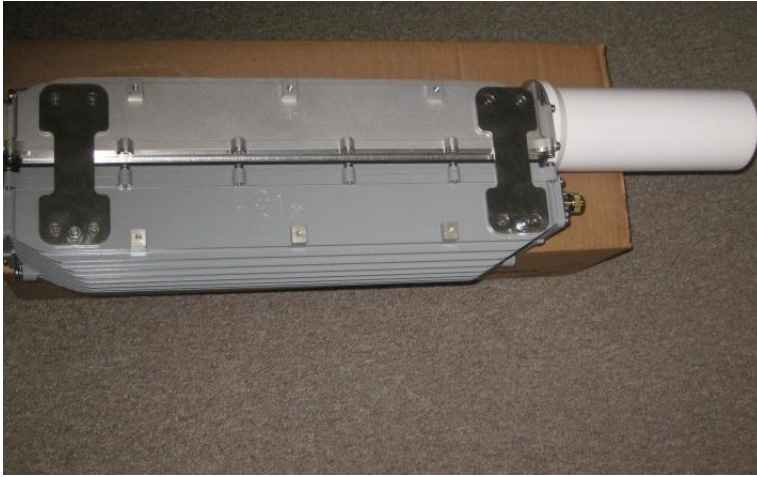


Figure 66 - Position back to back assembly on side to tighten all joining plate screws



Note: To fully tighten all of the screws it is recommended to place the cardboard packaging or other soft material under the units to protect the painted surfaces



Figure 67 - Mounting method with pole clamps recommended for back to back installations



Note: To support the additional weight of a back to back system on a single universal mounting plate it is recommended that a pole clamp kit is used (see figure 58) This provides a very strong mounting from a standard telecom tower equipment pole. For larger diameter poles where pole straps are required due to the larger diameter of the pole, it is recommended that 4 straps are used. It is important that pole straps sit flat against the mounting plate as shown in figure 59

Flatten each of the straps against the mounting plate
At the position shown to make sure that the mounting studs on the back to back AirSynergy assembly can slide into the mounting bracket slots without restriction from the backward facing cooling fins on the rear AirSynergy

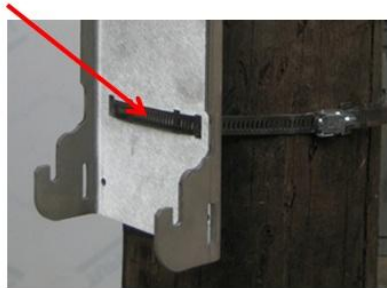


Figure 68 - Flatten straps against the mounting plate for back to back installations



Figure 69 - Back to Back AirSynergy mounted on pole with 4 mounting straps

Mount the assembly on the universal mounting bracket and secure the flange nuts. The GPS antenna and front mount antenna if used can be fitted before or after mounting to the pole depending on ease of access.

In cases where no front mount antenna is fitted, an extended sun shield is available as an accessory item and should be fitted. The fitting method is the same as the standard sun shield with 3 fixings on each side of the front AirSynergy unit.

Follow the normal procedures for the connection of power supply units and drop cabling to each of the back to back mounted AirSynergy units.



Note: When securing back to back assembly to the mounting plate a safety line or rope should be secured to the units. The 6mm tapped holes used for the protection ground at the bottom or the GPS mountings at the top of each Synergy unit provide strong anchor points for a safety line. (This is the same point used for protection ground connection in exposed areas or high lightening risk areas)

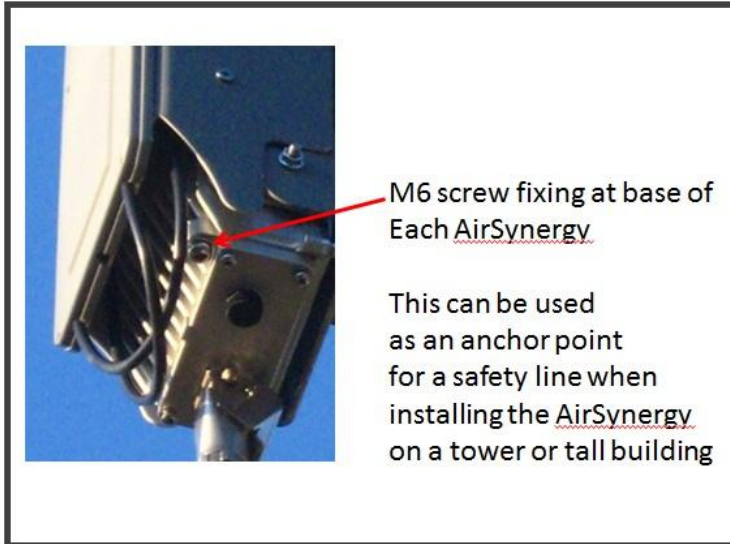


Figure 70 – M6 Screw fixing point as safety line anchor point

8 Appendix C – Glossary of Terms

AAA	Authentication, Authorization and Accounting
ARQ	Automatic Repeat Request
ASN	Access Service Network
ASN GW	ASN Gateway
BS	Base Station
BWA	Broadband Wireless Access
CPE	Customer Premises Equipment
FDD	Frequency Division Duplex
GUI	Graphical User Interface
HO	Handover/Handoff
IP	Internet Protocol
NEMA	National Electrical Manufacturers Association
MAC	Media Access Control
MIMO	Multiple Input Multiple Output
MS	Mobile Station
NLOS	Non Line of Sight
NSP	Network Service Provider
OFDMA	Orthogonal Frequency Division Multiplexing (Multiple Access)
PHY	PHYSical Layer
SDR	Software Defined Radio
TDD	Time Division Duplex
VoIP	Voice over IP

9 Appendix D – Checklist

The Checklist below gives the high-level steps in the Workflow for this procedure. Detach or print this page to use as a job-aid for completing the actions this procedure requires.

Table 3 - Checklist for Procedure

Procedure	Actions	Outcome
1. Verify Prerequisites	Verify site requirements Verify safety requirements Verify installation requirements	All requirements are in place for a successful installation
2. Install AirSynergy universal mounting plate	Install the universal mounting plate Verify connection torque settings	
3. Install AirSynergy on the mounting plate		
4. Connect and manage cables	Connect AirSynergy PoE cable Connect GPS	
5. Connect power system	Connect PSU to PoE injector Connect Power Connect the protection earth to the PoE injector box Connect Ethernet backhaul	

10 Appendix E – PSU for USA

To comply with US regulations that apply to outdoor deployments of mains power supplies, a special US version of the AirSynergy power supply has been produced with the PSU module and the mains connecting blocks enclosed in a small NEMA approved enclosure. The mains cable and 48V power cables are brought through the weatherproof glands provided. This type of power supply (SYN-PSU-ODUL-AC-1) must be used for all deployments in the USA.



Figure 71 – AirSynergy Mains PSU and enclosure for USA deployments

Remove the top cover of the PSU enclosure. Choose suitable positions for the PSU enclosure. The PSU enclosure should be screwed to a firm surface with screws in 4 positions which are only accessible with the top cover removed.

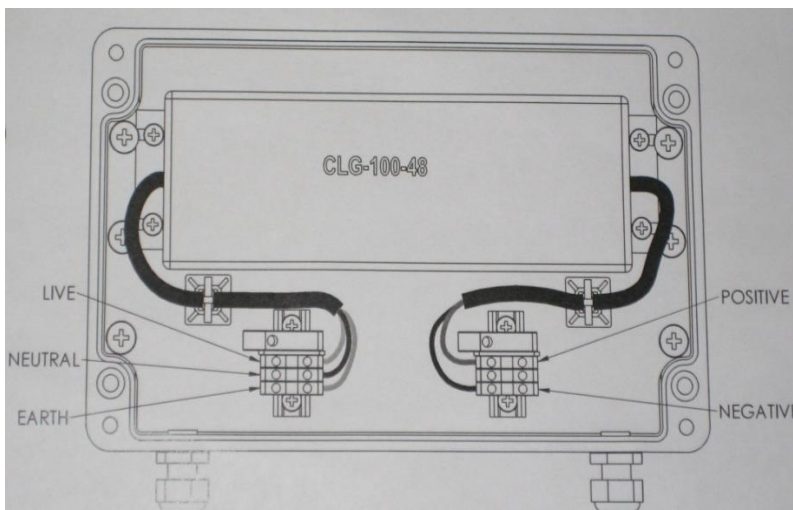


Figure 72 – Internal PSU and cable terminations

Feed the Synergy3 drop cable through the gland nearest to the low voltage connection and connect to the terminal strip, observing the correct polarity. (Blue wire in drop cable to negative terminal and Black wire in the drop cable to positive)

Isolate the mains supply and pass the mains cable through the input gland and terminate on the connection blocks provided. The termination blocks are clearly labelled as Live, Neutral and Earth.

Once the enclosure top cover has been re-fitted (4 screw positions) and the PoE wiring completed the mains power can be applied.



Safety - Disconnection of AC supply

- Where Airsynergy is connected directly to building wiring a suitably rated and readily accessible disconnect device shall be incorporated external to the equipment;
- Where Airsynergy is connected to the ac mains supply using a plug and socket, the socket-outlet shall be installed near the equipment and shall be easily accessible.

11 Appendix F – FCC Requirements

Airsynergy basestation, FCC ID: O2J-235AS, operating in the 2305-2320 and 2345-2360 MHz WCS Bands.

Federal Communications Rules for operation in USA

The correct setting of the following Base Station parameters in Netspan, are critical to the correct operation of equipment in compliance with the rules detailed in 47CFR27subpart C:

- Transmit Power
- Transmit Frequency
- Channel Bandwidth

Any attempt to alter these parameters outside those permitted by the Netspan software or the operator license could be a violation of that license

Transmit Power / Tune-up

Transmit power is set using the Netspan management software during install /commissioning.

The unit may transmit with a power of up to 30dBm at each antenna port when connected to cross polarised antenna with maximum gain of 18dBi

Airsynergy basestation, FCC ID: O2J-265AS, operating in the 2572-2614 MHz band.

Federal Communications Rules for operation in USA

The correct setting of the following Base Station parameters in Netspan, are critical to the correct operation of equipment in compliance with the rules detailed in 47CFR27subpart C:

- Transmit Power
- Transmit Frequency
- Channel Bandwidth

Any attempt to alter these parameters outside those permitted by the Netspan software or the operator license could be a violation of that license

Transmit Power / Tune-up

Transmit power is set using the Netspan management software during install /commissioning.

The unit may transmit with a power of up to 30dBm at each antenna port when connected to cross polarised antenna with maximum gain of 18dBi

Airsynergy Basestation, FCC ID: O2J-365AS, operating in the 3650-3700 MHz Band.

Federal Communications Rules for operation in USA

To ensure compliance FCC rules and regulations, the following should be observed:

- The 3650-3700 MHz frequency range is a licensed band in the USA and operators must have a valid spectrum license to operate Airsynergy equipment using this band.
- The Airsynergy base station requires operation using an Airspan FCC-specific version of Netspan supporting Listen Before Transmit. This management software only permits operation in the 3650-3700 MHz band.

Note: Netspan, the Airspan management system enforces FCC compliance in the upper 25MHz extension of this band above 3675 MHz.

- The unit and must be professionally installed.
- Any attempt to alter these parameters outside those permitted by the Netspan software or the operator license could be a violation of that license
- The correct setting of the following Base Station parameters in Netspan, are critical to the correct operation of equipment in compliance with the rules detailed in 47CFR90 subpart Z (Wireless Broadband Services in the 3650–3700 MHz Band):
 - Transmit Power
 - Transmit Frequency
 - Channel Bandwidth
 - Carrier Sense Threshold
 - Carrier Sense Backoff Frames

Transmit Power

Transmit power is set using the Netspan management software during install /commissioning.

For 5MHz channel operation, the maximum permitted EIRP is 5 W. Due to the additive effect of the MIMO antenna, the power setting in Netspan must be set such that:

$$\text{TX power (dBm)} + \text{Antenna gain (dBi)} \leq 36.5$$

For 10 MHz channel operation, the maximum permitted EIRP is 10 W. Due to the additive effect of the MIMO antenna, the power setting in Netspan must be set such that:

$$\text{TX power (dBm)} + \text{Antenna gain (dBi)} \leq 39.5$$

Airsynergy Basestation, IC:4548B - 90203300, operating in the 3650-3700 MHz Band.

Industry Canada Rules for operation in Canada

To ensure compliance with relevant rules and regulations, the following should be observed:



- The 3650-3700 MHz frequency range is a licensed band in Canada and operators must have a valid spectrum license to operate Airsynergy equipment using this band.
- The Airsynergy base station requires operation using an Airspan FCC-specific version of Netspan supporting Listen Before Transmit¹. This management software only permits operation in the 3650-3700 MHz band.

Note: Netspan, the Airspan management system enforces FCC compliance in the upper 25MHz extension of this band above 3675 MHz

- The unit must be professionally installed.
- Any attempt to alter these parameters outside those permitted by the Netspan software or the operator license could be a violation of that license
- The correct setting of the following Base Station parameters in Netspan, are critical to the correct operation of equipment in compliance with the rules detailed in RSS-197 (Wireless Broadband Access Equipment Operating in the 3650–3700 MHz Band):
 - Transmit Power
 - Transmit Frequency
 - Channel Bandwidth
 - Carrier Sense Threshold
 - Carrier Sense Backoff Frames

Transmit Power

Transmit power is set using the Netspan management software during install /commissioning.

The Maximum permitted total power density allowed in RSS-197 is 1W/MHz

Certification testing was performed with an antenna gain of 11dBi and the following transmit powers in Netspan software and these must not be exceeded during commissioning or use:

- 5 MHz channels: 23.5dBm
- 10 MHz Channels: 25.5 dBm

RF Exposure

The RF exposure requirements are detailed in RSS-210.

The safe distances from the AirSynergy Antenna unit is 25 cm under all operating conditions.

FCC and Industry Canada RF Exposure Requirements

FCC Maximum Permissible Exposure (MPE) limits for equipment operating in the frequency range 1500 – 100,000 MHz is 1.0 mW/cm².

Following installation and commissioning, the safe distance from the antenna is the greater of:

¹ This software version is generically called the “Airspan FCC-specific version” as the software was historically written to comply with 47CFR90Z which imposes a similar Contention Based Protocol Requirement



20cm

Or

r cm, where $r = \sqrt{(PG/4\pi S)}$

P: power input to antenna(s) in mW

G: numeric gain of antenna relative to isotropic radiator

S: power density in mW/cm² = 1 mW/cm²

The device has two antenna ports, so safe distance from the antenna shall be the greater of:

20 cm or $\sqrt{(2*PG/4\pi S)}$

Which gives

20 cm or $\sqrt{(0.16*P*G)}$ cm.

12 Appendix G – Declaration of Conformance (CE) for Airsynergy

Following European guidance to include the Declaration of Conformance into the user manual, the Declaration of Conformance for AirSynergy is included here in the 11 languages of the Community relating to the 2.3GHz and 3.6GHz variants of the AirSynergy product.

These equipments must only be operated under licence

Note: A copy of full declaration of conformity may be obtained from Airspan Communication Ltd, Capital Point, 33 Bath Road, Slough Berkshire SL1 3UF UK

English	Hereby, Airspan Communications Ltd., declares that this AirSynergy (2.3 and 3.6GHz variants) is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
Finnish	Airspan Communications Ltd. vakuuttaa täten että AirSynergy (2.3 and 3.6GHz) tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
Dutch	Hierbij verklaart Airspan Communications Ltd. dat het toestel AirSynergy (2.3 and 3.6GHz) in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG
	Bij deze verklaart Airspan Communications Ltd. dat deze AirSynergy (2.3 and 3.6GHz) voldoet aan de essentiële eisen en aan de overige relevante bepalingen van Richtlijn 1999/5/EC.
French	Par la présente Airspan Communications Ltd. déclare que l'appareil AirSynergy (2.3 and 3.6GHz) est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE
	Par la présente, Airspan Communications Ltd. déclare que ce AirSynergy (2.3 and 3.6GHz) est conforme aux exigences essentielles et aux autres dispositions de la directive 1999/5/CE qui lui sont applicables
Swedish	Härmed intygar Airspan Communications Ltd. att denna AirSynergy (2.3 and 3.6GHz) står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.
Danish	Undertegnede Airspan Communications Ltd. erklærer herved, at følgende udstyr AirSynergy (2.3 and 3.6GHz) overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF
German	Hiermit erkläre Airspan Communications Ltd., dass sich dieser/diese/dieses AirSynergy (2.3 and 3.6GHz) in Übereinstimmung mit den grundlegenden Anforderungen und den anderen relevanten Vorschriften der Richtlinie 1999/5/EG befindet". (BMWi)
	Hiermit erkläre Airspan Communications Ltd. die Übereinstimmung des Gerätes AirSynergy (2.3 and 3.6GHz) mit den grundlegenden Anforderungen und den anderen relevanten Festlegungen der Richtlinie 1999/5/EG. (Wien)
Greek	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ Airspan Communications Ltd. ΔΗΛΩΝΕΙ ΟΤΙ AirSynergy (2.3 and 3.6GHz) ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ



Italian	Con la presente Airspan Communications Ltd. dichiara che questo AirSynergy (2.3 and 3.6GHz) è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Spanish	Por medio de la presente Airspan Communications Ltd. declara que el AirSynergy (2.3 and 3.6GHz) cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE
Portuguese	Airspan Communications Ltd. declara que este AirSynergy (2.3 and 3.6GHz) está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.



13 Appendix H - Document Status

13.1 Revision History

Revision	Originator	Date	Description
Draft 1	J. Forrester	07-2011	Initial document
Draft 2	J. Forrester	10-2011	Revised document
Draft 3	J. Forrester	10-2011	Revised document with PoE injector install details
Revision A0	J. Forrester	11-2011	Edited with review comments and added new Appendix B
Revision A0.1	J. Forrester	11-2011	Typo corrections and replaced copy of galvanic corrosion table
Revision A0.2	J. Forrester	12-2011	New Appendices for USA PSU and FCC rules
Revision A0.3	Y. Jarrar	09-2012	Added Initial BS Commissioning and Discovery in Netspan
Revision A0.41	J. Forrester	11-2012	New Appendices for CE Declaration of Conformance and updated FCC rules and other Minor corrections for figure numbering



Revision	Originator	Date	Description
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Customer Service Help-Desk for customer service emergency

Airspan Networks have introduced the Airspan Tracker application to enable prompt and efficient Customer Support services.

If you do not have an Airspan Tracker account, please obtain login credentials by filling-in the form in the main page at www.airspan.com/Support Register New Account.

Worldwide Headquarters:

Airspan Networks Inc.
777, Yamato Road, Suite 310,
Boca Raton, FL 33431, USA
Tel: +1 561 893 8670

www.airspan.com

Feedback: To provide feedback on this document, please send comments to the following email address: jforrest@airspan.com