



UGD-D00093 Rev A.1

**HiperMAX
Masthead Equipment
Installation Guide**

Software Release 7.5





HiperMAX Masthead 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 HiperMAX masthead equipment. These procedures include:

- Verify Prerequisites
- Install the SCRT plate mount
- Install the SCRT pole mount
- Connect and manage cables
- Connect to power system

1.2 Intended Audience

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

HiperMAX Hardware Configuration Guide

Job Specification

Lightning Protection Overview

Airspan WiMAX Product Bulletin PB/ASM/2008/005

1.5 Organisation of this Guide

This guide is organised into the following Sections:

- About this Guide
- Introduction
- Get Started
- Verify Prerequisites
- Install the SCRT plate mount
- Install the SCRT pole mount
- Connect and manage cables
- Connect to power system
- Appendixes

2 Introduction

This section provides a descriptive overview of the product and its place in the product suite.

2.1 General Overview

The Masthead subsystem is common to both HiperMAX and HiperMAX-Micro and comprises the Antenna, SCRT, Sunshield and Pole Mount Kit, as illustrated below.



Figure 1 – HiperMAX Hardware Components

2.1.1 Vertical Sector Antenna to fit SCRT

Standard system configurations utilise a compact vertically polarised sector antenna which mounts and connects directly to the SCRT. Available in 60, 90 and 120 degree sector beamwidths.

The antenna unit is supplied with antenna fixing kit, rear sunshield, sunshield fixing kit, pole mounting kit and grounding strap kit.



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3 Get Started

3.1 Workflow of Installation

The workflow required to install the HiperMAX-micro is shown in the following diagram:

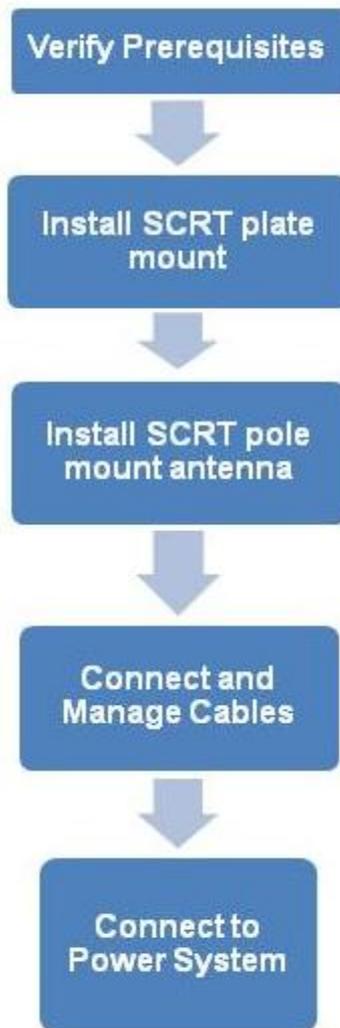


Figure 2 – Workflow of HiperMAX SCRT Masthead Installation



3.2 HiperMAX Installation Checklist

Plan the installation of the HiperMAX ATCA by using the Installation Checklist, which you can find as a removable job aid in the Appendix of this document.

4 Verify Prerequisites

4.1 Verify Site Requirements

[E.g., In normal operation, a separate server and client PC are required. The server and client may be located remotely from the equipment being managed.]

4.2 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.

4.2.1 Warn 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 severe arcing that may result in burns or eye damage. Remove rings, watches etc. to avoid shorting DC circuits.

NOTES

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.

4.2.2 Adhere to European Directive 1999/519/EC

European Directive 1999/519/EC details basic restrictions and reference levels on human exposure to electromagnetic fields as advised by the ICNIRP. The directive states that 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 such fields.

4.3 Verify Installation Requirements

4.3.1 Verify the Tools

Tool
Large Crosshead Screw driver Phillips # 3 or Pozidrive # 3
Small flat blade Screwdriver
Medium Flat Bladed Screwdriver
13mm or 1/2 inch open ended Spanner
10mm or 13/32 inch open ended Spanner
Wire strippers
Wire cutters
Ring terminals crimp tool
RJ45 crimp tool

Table 1 – HiperMAX-micro installation tools

4.3.2 Verify the Parts and Kits

Installation Kit / Part:	SCRT Installation Kit Mount per SCRT consisting of:	Note:
SCRT Base Station RF	1 x SCRT Unit	
	1 x Sun shield	Not required when SCRT mounted antenna is used
	1 x Antenna with mounting brackets	
	1 x SCRT installation plate mount kit (see below for additional mounting options)	4 M6 screws 4 M6 flat washers 4 M6 spring washers
	1 earth kit	

Table 2 – HiperMAX-micro installation parts and kits

Installation Kit / Part:	SCRT Installation Kit Mount per SCRT consisting of:	Note:
Connecting cables	1 x fibre 1 x power	Available in lengths of 3, 10, 30 and 100 metres

Table 3 – HiperMAX-micro additional parts and kits

Optional Mounting Kits	
SCRT Installation Kit Pole Mount	SCRT Installation Kit Wall Mount
4* M6X20mm Screws	4* M6x20mm Screws
4* M6 Flat Washers	4* M6 Flat Washers
4* M6 Spring Washers	4* M6 Spring Washers
1* Bracket (2Part)	1* Bracket (2Part)
1* M8x85mm Bolt	1* M8x85mm Bolt
1* M8 Nut	1* M8 Nut
2* U-Bolts with Nuts and Washers	4* Screws and Wall Plugs, The length of the screws should be suitable for the surface being fixed to.

Table 4 – HiperMAX-micro optional mounting kits

Installation Kit / Part	Note
Surge Protection	LPK-SCRT-PWR-1: SCRT Power Lightning Protection Kit - consisting of 1x 48V surge arrester – Optional.

Table 5 – HiperMAX-micro surge protection kit

Installation Kit / Part	Note
Antenna / Feeder (not always provided by Airspan)	Antenna and feeder
	Short feeder of 1 to 2 metres

Table 6 – HiperMAX-micro antenna and feeder kits

Additional items (not provided by Airspan)
Cable ties
Ring terminal for earth strap, M5 / M6
Earth strap cable (4 to 6 mm), yellow and green cable

Table 7 – HiperMAX-micro additional items

4.3.3 Verify Components

HiperMAX SCRT

- The HiperMAX-micro Channel RF Transceiver unit (SCRT).



Figure 3 – HiperMAX-micro SCRT, Antenna, Mast Head Mounted



Figure 4 – HiperMAX-micro SCRT



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5 Install the SCRT plate mount

5.1 Mount the SCRT

The SCRT is normally mounted on a pole (in close proximity to its external antenna if not using the SCRT mounted Antenna). Alternatively, there is provision for the SCRT to be mounted by screwing into the back through a metal mounting plate. The SCRT should be mounted so that the power and optic connectors are facing down.

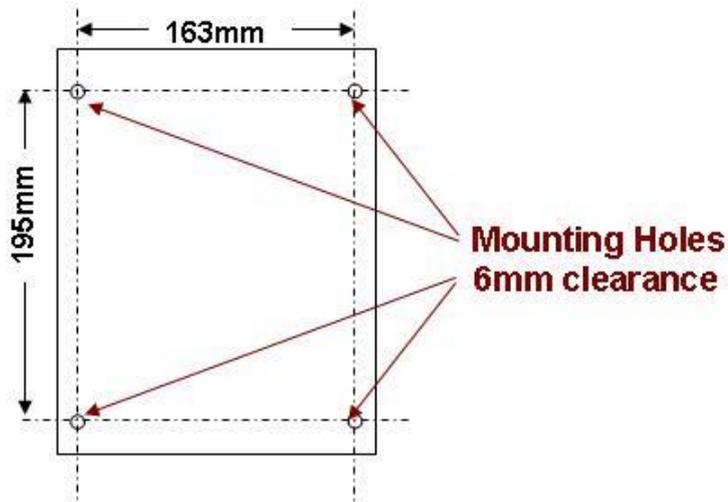


Figure 5 – HiperMAX-micro SCRT connection mounting plate design

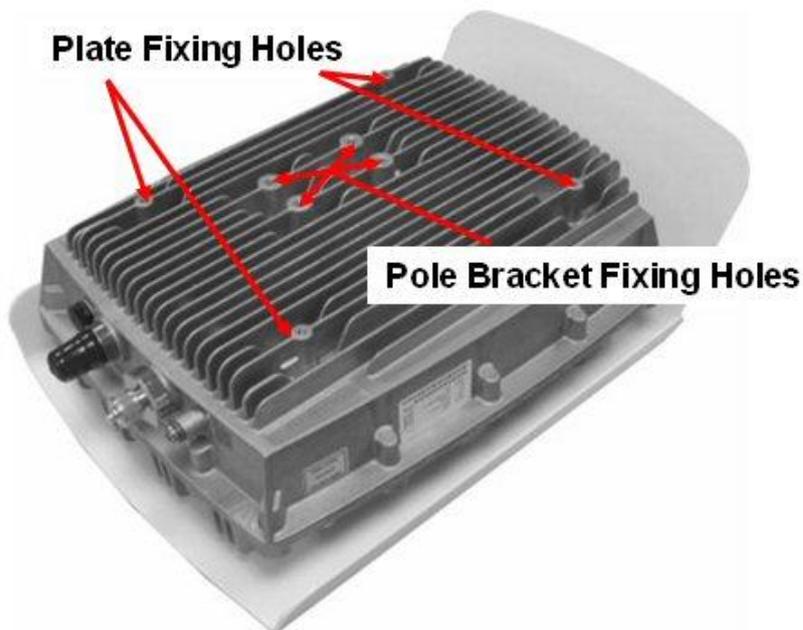


Figure 6 – HiperMAX-micro SCRT connection fastening holes

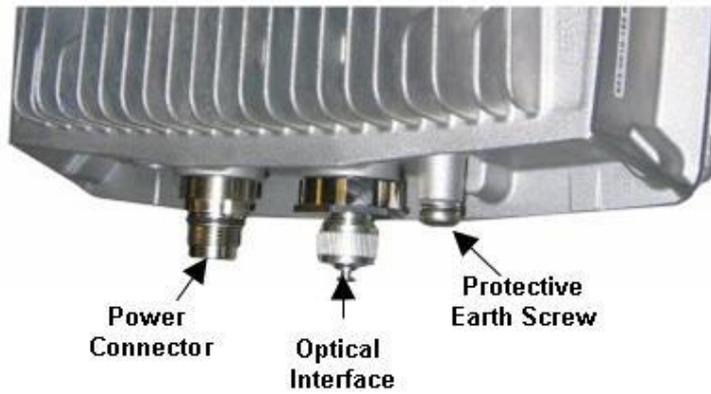


Figure 7 – HiperMAX-micro SCRT termination panel

5.2 Verify Connection Torque Settings

Connection	Torque Setting
Mains Connector and 48V Connectors	300N.cm
OBSAI Connectors	100N.cm

Table 8 – HiperMAX-micro connection torque settings

6 Install SCRT pole mount

The SCRT can be used either with an antenna mounted on the SCRT or with a remotely attached RF antenna.



Figure 8 – HiperMAX-micro SCRT and antenna pole mounted

6.1 Mount antenna to SCRT

To mount the antenna to the SCRT, perform the following steps:

1. To attach the brackets to the rear of the antenna, fix the brackets to the studs with the nuts and washers provided.

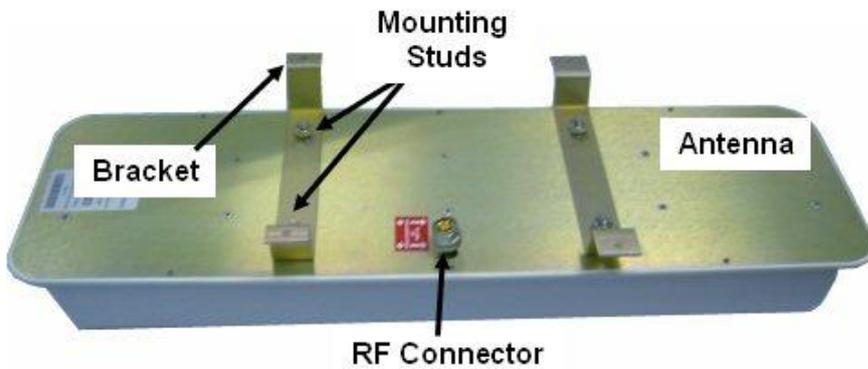


Figure 9 – HiperMAX-micro antenna and mounting studs

2. Place the SCRT on a flat surface with the RF connector facing up as shown in image below.

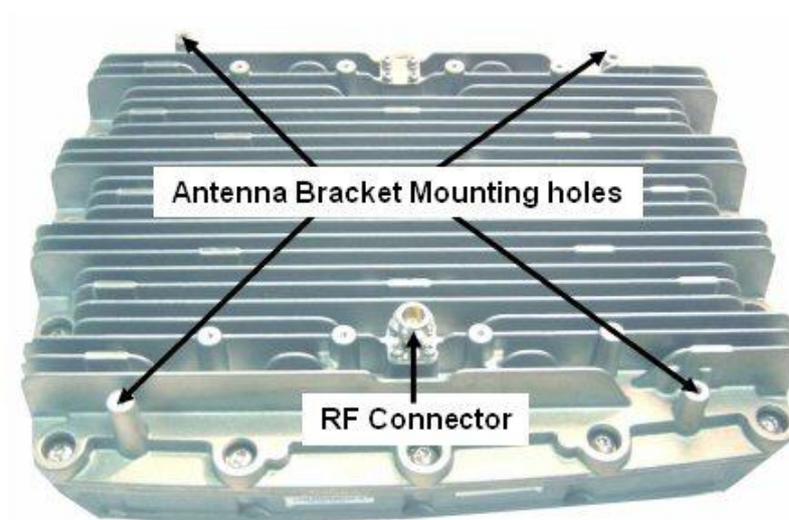


Figure 10 – HiperMAX-micro SCRT antenna bracket mounting holes

3. Place the antenna on top of the SCRT so that the RF connector on the antenna mates with the RF connector on the SCRT



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



For a detailed description of the correct installation practices specific to the RF connector, please refer to *Airspan WiMAX Product Bulletin PB/ASM/2008/005* available on the Airspan share methods site.



Caution: Do not detach the antenna from the SCRT after the RF connector is connected. The RF connector can be damaged if the antenna is detached from the SCRT after the RF connector is connected.

4. Be careful not to let the RF cable twist (use a spanner to hold the back steady when the outer lock nut is tightened), then use a calibrated torque spanner to tighten the connector (in a clockwise direction) **in strict accordance with the following instruction:** The N-type RF connector that connects the Sector antenna to the SCRT should only be tightened in line with the manufacturers recommended torque setting – 0.68:1.13 NM.



Figure 11 – HiperMAX-micro SCRT antenna RF connection

5. Use a Pozi-drive screwdriver and the screws provided to secure the brackets to the SCRT.



Figure 12 – HiperMAX-micro secure SCRT antenna bracket

6. Apply electrical tape to the weather-exposed RF connector.

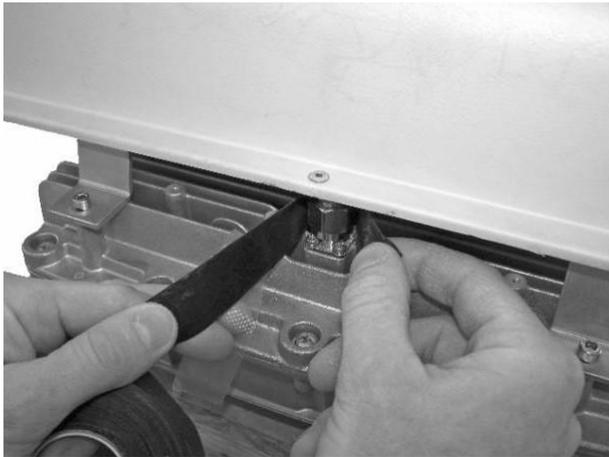


Figure 13 – HiperMAX-micro SCRT antenna tape RF connection

7. Ensure the RF connector is completely sealed from the weather.

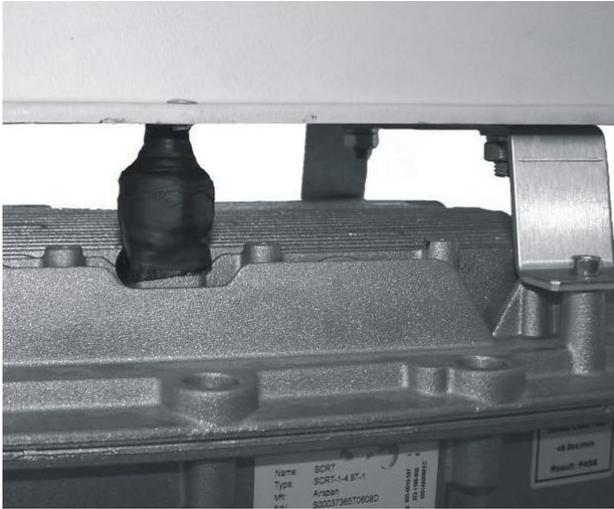


Figure 14 – HiperMAX-micro SCRT antenna seal RF connection

8. Carefully turn the assembled SCRT and antenna unit so it rests flat on the antenna face with the SCRT air baffles facing up as shown below.



Figure 15 – HiperMAX-micro SCRT antenna assembled unit

9. Use the four (4) M6 screws to fix the sun shield to the SCRT.

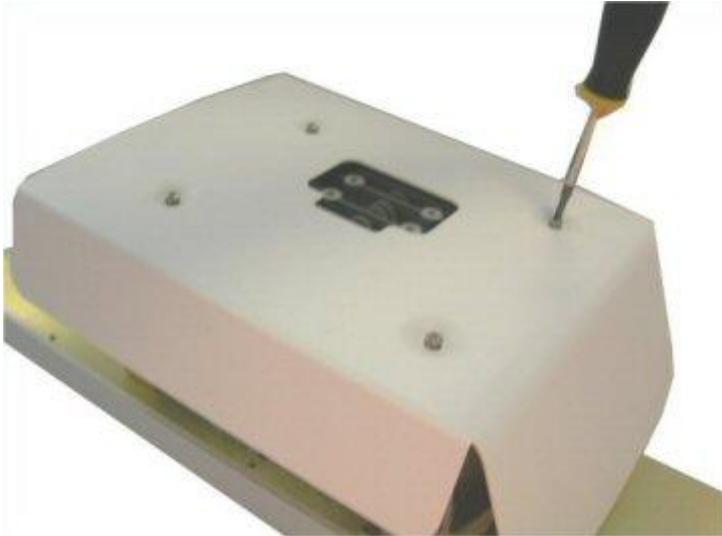


Figure 16 – HiperMAX-micro SCRT attach sun shield

6.2 Mount SCRT and Antenna to pole

1. Fix the flanges of the pole mount bracket to the sun shield as shown below.



Figure 17 – HiperMAX-micro SCRT attach pole-mount bracket to SCRT

2. Use the two U bolts nuts, flat washers and spring washers to fix the other half of the pole mount bracket to the pole as shown below.



Figure 18 – HiperMAX-micro SCRT attach pole mount bracket to pole

3. Join together the two halves of the bracket and clamp with the nut, bolt, and locking washers provided. The part of the bracket connected to the SCRT is designed to locate in the head of the bolt and stop it rotating. This allows the SCRT to be Vertically aligned. Horizontal alignment is achieved by loosening the U-Bolts slightly and rotating around the pole.



Figure 19 – HiperMAX-micro SCRT attach SCRT and antenna to pole



Figure 20 – HiperMAX-micro SCRT and antenna attached to pole mount

4. Connect the ground braid to the earth point on the termination panel of the SCRT as shown below.



Figure 21 – HiperMAX-micro SCRT attach earth braid to SCRT

5. Connect the earth braid to the pole using the TK series clamp as shown in the diagram below.

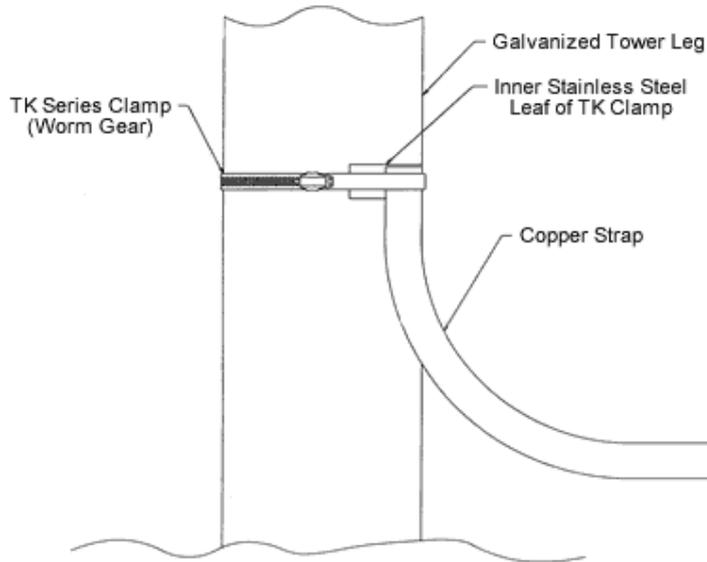


Figure 22 – HiperMAX-micro SCRT attach earth braid to pole



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7 Connect and Manage Cables

7.1 Connect HiperMAX

1. Run the cable from the Antenna to the GPS Shelf and attach to the GPS Antenna port and attach to the GPS Antenna.
2. Neatly tie any excess cable (see Secure Fibre-optic Cable in the Appendix for this guide).

7.2 Connect Optic interface for HiperMAX-micro

Each SCRT is provided with a 3 metre optical fibre cable, ready terminated with optical connectors. Unscrew the protective dust cap and screw the fibre optic cable in place.

7.3 Connect Optic interface for HiperMAX ATCA

Each SCRT is connected with optical fibre cable, ready terminated with optical connectors. Unscrew the protective dust cap and screw the fibre optic cable in place.

7.4 Install GPS Antenna



Checkpoint: If the HiperMAX-micro GPS is specified for this installation, follow this instruction. Otherwise exit this instruction and proceed to the next one.

7.4.1 Install GPS antenna for HiperMAX-micro



SDR-micros that have the GPS option have a GPS antenna and four metres of cable included.

Install the GPS antenna for the HiperMAX-micro using a 4 m standard cable and optional pole mount bracket.

The first consideration for a GPS antenna is a clear view of the sky, preferably 360 degrees. In the usual installation, the GPS antenna is located low and close to the equipment building roof. The GPS antenna should be attached to a suitable mast and connected at the base of the SDR-micro.

Use the guidance below to find the optimal position for mounting the GPS antenna:

- a) The antenna must be mounted in an upward position.
- b) The antenna should be installed at the highest possible point available at the site. This is to ensure minimum obstruction from any surrounding obstacles (trees, buildings or other installations, etc.).
- c) To avoid influence of reflected waves, the antenna must not be installed less than 2m away from metallic objects with a dimension greater than 20 cm.

- d) Antenna installation should be avoided in close proximity with other receivers or transmitters likely to cause interference.
- e) The antenna should be positioned to minimise the risk of a lightning strike. See *Lightning Protection Overview* for guidance on placement.
- f) The antenna should be placed within 4 metres of the SDR-micro.

7.4.2 Install GPS antenna for HiperMAX ATCA

Install the GPS antenna for the HiperMAX ATCA using a 16 m standard cable and optional pole mount bracket.

The first consideration for a GPS antenna is a clear view of the sky, preferably 360 degrees. The GPS antenna should be attached to a suitable mast.

Use the guidance below to find the optimal position for mounting the GPS antenna:

- a) The antenna must be mounted in an upward position.
- b) The antenna should be installed at the highest possible point available at the site. This is to ensure minimum obstruction from any surrounding obstacles (trees, buildings or other installations, etc.).
- c) To avoid influence of reflected waves, the antenna must not be installed less than 2m away from metallic objects with a dimension greater than 20 cm.
- d) Antenna installation should be avoided in close proximity with other receivers or transmitters likely to cause interference.
- e) The antenna should be positioned to minimise the risk of a lightning strike. See *Lightning Protection Overview* for guidance on placement.

7.4.3 Mount the GPS Antenna

The GPS antenna bracket can be optionally mounted on a Pole up to 40mm (1.5"). The Antenna screws on to the 25m threaded tube.



Figure 23 – HiperMAX GPS antenna bracket

1. The RJ58 antenna cable is provided with a TNC connector attached at each end. Run the cable from the SDR-micro or HiperMAX GPS receiver to the location of the GPS antenna.
2. Thread the TNC connector cable through the threaded tube on the bracket and attach the TNC connector to the Antenna.
3. Connect the tube to the antenna by holding the antenna firm and rotating the bracket around the cable until the thread is fully engaged in the threaded part of the antenna.
4. Connect the bracket to the pole using the two U bolts and tightening with a 10mm spanner.

7.5 Connect GPS 1 pps



Checkpoint: If the HiperMAX-micro GPS is specified for this installation, follow this instruction. Otherwise, exit this instruction and proceed to the next one.

This interface is used to provide 1 pulse /sec synchronisation between a HiperMAX-micro master SDR and a HiperMAX-micro slave SDR.

A 1.5 metre connecting cable (terminated at both ends with TNC connectors) is provided with a slave BS.

7.6 Connect GPS 10MHz out



Checkpoint: If the HiperMAX-micro GPS is specified for this installation, follow this instruction. Otherwise, exit this instruction and proceed to the next one.

This interface is used to provide 10MHz clock between a HiperMAX-micro master SDR and a HiperMAX-micro slave SDR.

A 1.5 metre connecting cable (terminated at both ends with TNC connectors) is provided with a slave BS.

7.7 Connect Optic Interface to SCRT

Each SCRT is provided with various metre optical fibre cable, ready terminated with optical connectors. Unscrew the protective dust cap and screw the fibre optic cable in place.

1. Attach the fibre and DC cables to the connectors on the termination panel of the SCRT as shown below.

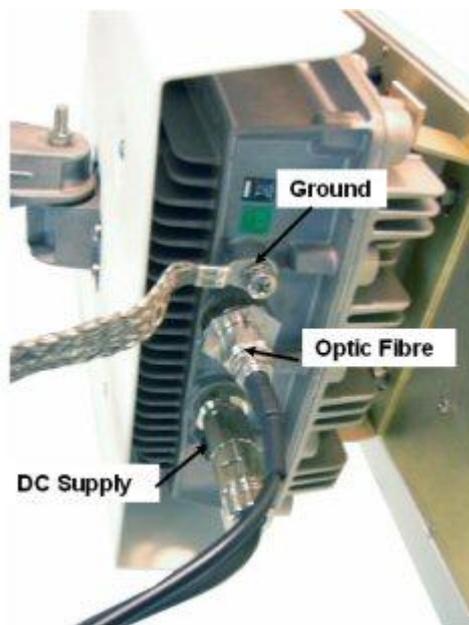


Figure 24 – HiperMAX-micro SCRT attach cables to termination panel

2. Cable and connect:
 - Optical
 - Power
 - GPS



For a detailed description of the correct installation practices specific to the connections to the HiperMAX ATCA and Micro Installation Guides available on the Airspan share methods site.

8 Connect to Power System



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.**

8.1 Power Output to SCRT

Each SCRT is provided with various lengths 48 volt power cable terminated with a male connector at one end and a female connector at the other.



Warning: The male connector attaches to the SDR and the female connector attaches to the SCRT. It is important that the power connector is attached at the correct end (see illustration below) or damage to the connector/equipment will result.

8.2 Run cables to SCRTs connectorised at both ends

Use this procedure to terminate the DC supply for the SCRT at the -48VDC source when using connectorised DC cable parts.

- PWR-10-INST-1
- PWR-30-INST-1
- PWR-100-INST-1 (if using this cable the supply must be sufficient to ensure -40.5 volts are available at the SCRT)

Some implementations of HiperMAX use connectorised 48V UL1015 DC cables. These same cables are used for HiperMAX-micro where both the connectorised ends are used. When using these cables for HiperMAX, however, the connectorised end at the 48VDC Source (labelled SDR) has to be removed to allow for a wires only termination.

Conventional power wiring within the 48VDC Source uses blue for 48V negative and black for 48V positive.



The SDR-micro uses black for 48V negative and white for return, and there is a possibility that the wires could be incorrectly terminated when used on HiperMAX. This can result in permanent damage to the SCRT.

The correct termination is cited below.

To run cables to SCRTs connectorised at both ends, perform the following steps:

1. Run cable from the SCRT to the DC source breakers. (The DC source end is labelled SDR.)
2. Cut off the connector at the end labelled SDR. The picture below shows the SDR end.



Figure 25 – HiperMAX-micro power connector cable termination

3. Connect to the 48VDC source distribution panel as shown in the table below:
4. Do not apply power to the SCRT until the commissioning stage.

9 Appendix A

9.1 Review Job Sheet

The *Job Sheet* should include the following information:

- **BS location and ATCA rack identity.**
- **Whether the system is required to be locked to a GPS timing reference.**
- **Whether the SDR is to be a Primary Master, Secondary Master or a Slave.** This information will be mapped to the ATCA rack slot number by this procedure.
- **A BSID is required for each SDR Blade.** This should be in a format xxxxxx:xxxxxx where x is a decimal digit.
- **The mapping of SCRT ID to OBSAI port ID on the SDR blade.**
- **Network configuration information for the SDR blade.** This shall include the following information for the front panel and the backplane.

Traffic Port: Defines whether traffic is via the front panel of the SDR blade, Primary Backplane or Secondary 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 Autonegotiate 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 Netpans Discovery Parameters (found under Server on Netspans left hand panel).

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

SNMP Port Number: This should be specified to the same value as in Netpans Discovery Parameters (found under "Server" on Netpans left hand panel).

IP Address: This specifies Netpans IP address (found under Server Global Configuration, which is under Server on Netpans left hand panel).

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

Port Number: Normally specified to a value of 9023.

- **Whether the Primary Master blade or the Secondary Master blade manages the GPS module.**
- **NTP configuration.** This specifies a list of NTP servers.

9.2 Secure Fibre-optic Cable

The Milli-Tie can be used to secure cables in the same manner as normally used for nylon straps. The steps below show the basic use of the product.



Over-tightening of cable ties may causes damage and degrade system performance.

To secure fibre-optic cables, perform the following steps:

1. Place the Millie-Tie around the target, and thread the tongue through the last large aperture in the rearmost cell.



Figure 26 – HiperMAX secure fibre-optic cable, place tie

2. Pull or slide the Millie-Tie onto the target. Note that the Millie Tie stretches to cushion the installation.



Figure 27 – HiperMAX secure fibre-optic cable, pull tie

3. Release the tension when snug, then cut and remove any excess strip. Always cut through the square sections, not the wider cells.



Figure 28 – HiperMAX secure fibre-optic cable, snug tie



Millie-Tie is efficient, and simply gets a little shorter after each use. The remaining strip can be kept and reused.



Figure 29 – HiperMAX secure fibre-optic cable, cut excess tie

4. Repeat these steps for each use.



Figure 30 – HiperMAX secure fibre-optic cable, use excess tie



Figure 31 – HiperMAX secure fibre-optic cable, re-use excess tie

10 Appendix B – Troubleshooting

TBD ['WiMAX Product'] troubleshooting.

Symptom	Problem	Solution
'['WiMAX Product'] did unexpected behaviour 1 ...describe]'	'The problem associated with unexpected behaviour 1 ...describe]'	'The solution suggested for addressing unexpected behaviour 1 ...describe]'
'['WiMAX Product'] did unexpected behaviour 2 ...describe]'	'The problem associated with unexpected behaviour 2 ...describe]'	'The solution suggested for addressing unexpected behaviour 2 ...describe]'
'['WiMAX Product'] did unexpected behaviour 3 ...describe]'	'The problem associated with unexpected behaviour 3 ...describe]'	'The solution suggested for addressing unexpected behaviour 3 ...describe]'
'['WiMAX Product'] did unexpected behaviour 4 ...describe]'	'The problem associated with unexpected behaviour 4 ...describe]'	'The solution suggested for addressing unexpected behaviour 4 ...describe]'

Table 9 -- Troubleshooting Tips



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11 Appendix C – Glossary of Terms

AAA	Authentication, Authorization and Accounting
AAS	Advanced Antenna System
AF	Application Function
ARQ	Automatic Repeat reQuest
ASN	Access Service Network
ASN GW	ASN Gateway
ATCA	Advanced Telecommunications Computing Architecture
BS	Base Station
BWA	Broadband Wireless Access
CHAP	Challenge Handshake Authentication Protocol
CPE	Customer Premises Equipment
CQI	Channel Quality Indicator
CSN	Connectivity Service Network
DSM	Digital Surface Model
DTM	Digital Terrain Model
EAP	Extensible Authentication Protocol
FA	Foreign Agent
FBSS	Fast Base Station Switching
FDD	Frequency Division Duplex
GUI	Graphical User Interface
HA	Home Agent
H-ARQ	Hybrid Automatic Repeat reQuest
HO	Handover/Handoff
IMS	IP Multimedia Subsystem
IP	Internet Protocol
IPsec	IP security
LR	Location Register
MAC	Media Access Control
MDH	Macro Diversity Handover
MIMO	Multiple Input Multiple Output
MIP	Mobile IP
MRC	Maximal Ratio Combining
MS	Mobile Station
NAP	Network Access Provider
NAS	Network Access Server



NLOS	Non Line of Sight
NSP	Network Service Provider
NWG	Network Working Group
OBSAI	Open Base Station Standard Initiative
OFDMA	Orthogonal Frequency Division Multiplexing (Multiple Access)
PA	Paging Agent
PAAA	Proxy AAA
PC	Paging Controller
PF	Policy Function
PHY	PHYSical Layer
PMIP	Proxy MIP
PPP	Point-to-Point Protocol
RADIUS	Remote Authentication Dial In User Service
RRA	Radio Resource Agent
RRC	Radio Resource Controller
RRM	Radio Resource Management
SAS	Smart Antenna System
SDR	Software Defined Radio
SFA	Service Flow Authorization
SFM	Service Flow Management
SIM	Subscriber Identity Module
SIP	Session Initiation Protocol
SOFDMA	Scalable Orthogonal Frequency Division Multiplexing (Multiple Access)
STC	Space Time Coding
TDD	Time Division Duplex
VoIP	Voice over IP
X.509	ITU-T standard for PKI digital certificates

12 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.

Procedure	Actions	Outcome
1. Verify Prerequisites	1.1 Verify site requirements 1.2 Verify safety requirements 1.3 Verify installation requirements	All requirements are in place for a successful installation or upgrade to new version of Netspan.
2. Install SCRT plate mount	2.1 Mount the SCRT 2.2 Verify connection torque settings	
3. Install SCRT pole mount	3.1 Mount antenna to SCRT 3.2 Mount SCRT and antenna to pole	
4. Connect and manage cables	4.1 Connect HiperMAX 4.2 Connect HiperMAX-micro 4.3 Connect optic interface for HiperMAX ATCA. 4.4 Install GPS antenna 4.5 Connect GPS 1 pps 4.6 Connect GPS 10MHz out 4.7 Connect optic interface to SCRT	
5. Connect power system	5.1 Power output to SCRT 5.2 Run Cables to SCRTs connectorised at both ends	

Table 10 – Checklist for Procedure



HiperMAX Masthead Equipment Installation Guide



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