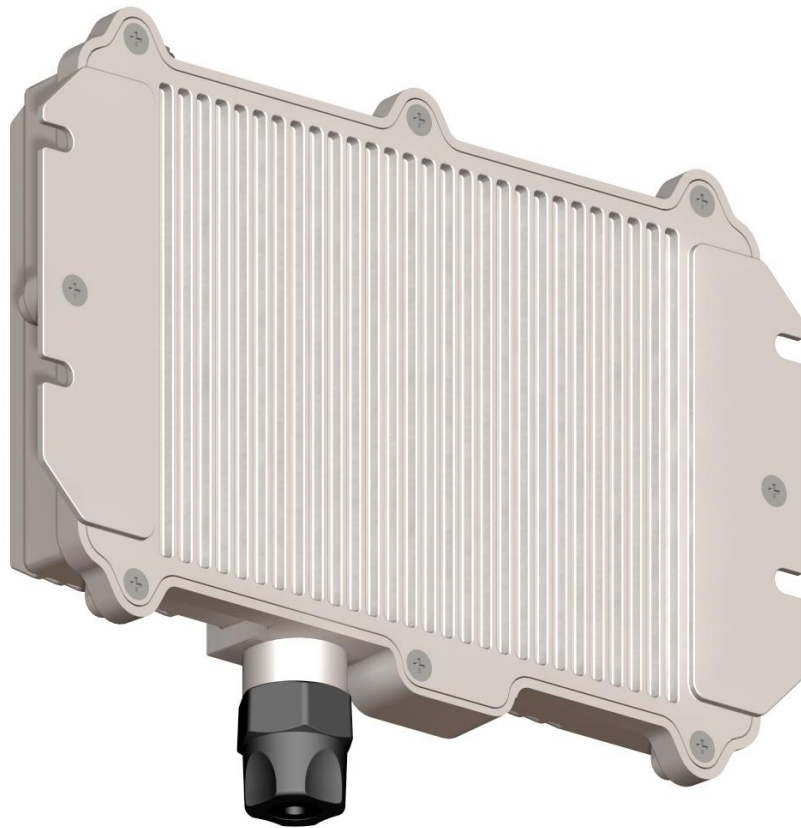


AN-80i

Advanced Broadband Wireless Infrastructure Solutions



Installation Guidelines

Copyright Information

All rights reserved February 18, 2011. The information in this document is proprietary to Redline Communications Inc. This document may not in whole or in part be copied, reproduced, or reduced to any medium without prior consent, in writing, from Redline Communications Incorporated.

Disclaimer

The statements, configurations, technical data, and recommendations in this document are believed to be accurate and reliable, but are presented without express or implied warranty. Additionally, Redline makes no representations or warranties, either expressed or implied, regarding the contents of this product. Redline Communications shall not be liable for any misuse regarding this product. The information in this document is subject to change without notice. No part of this document shall be deemed to be part of any warranty or contract unless specifically referenced to be part of such warranty or contract within this document.

CONTENTS SUMMARY

1	Safety & Service Notices.....	8
1.1	Safety Warnings.....	8
1.2	Warning Symbols.....	9
1.3	Service & Warranty Information.....	9
1.4	Lightning/Surge Protection.....	9
1.5	Deployment in the USA and Canada	10
2	Site Survey Information	14
2.1	Introduction.....	14
2.2	RF Interference.....	15
2.3	Path Profile.....	15
2.4	Overview.....	17
2.5	Customer Supplied Materials.....	18
2.6	Network Information	19
2.7	Link Budget Tool.....	20
3	Installation Procedures	21
3.1	Step 1: Mounting Kits	21
3.2	Step 2: RF Connections.....	31
3.3	Step 3: Ethernet Connections	34
3.4	Step 4: Installing the AN-80i.....	39
3.5	Step 5: Install Indoor PoE Power Block.....	48
3.6	Step 6: Configure AN-80i.....	49

TABLE OF CONTENTS

1	Safety & Service Notices.....	8
1.1	Safety Warnings.....	8
1.2	Warning Symbols.....	9
1.3	Service & Warranty Information.....	9
1.4	Lightning/Surge Protection.....	9
1.5	Deployment in the USA and Canada.....	10
1.5.1	FCC & IC Notices.....	10
1.5.2	Installation and Operation.....	11
1.5.3	Power Settings.....	11
1.5.4	Recommendations to UNII band Users.....	11
1.5.5	UL Information.....	13
1.5.6	WEEE Product Return Process.....	13
2	Site Survey Information.....	14
2.1	Introduction.....	14
2.2	RF Interference.....	15
2.3	Path Profile.....	15
2.4	Overview.....	17
2.5	Customer Supplied Materials.....	18
2.6	Network Information.....	19
2.7	Link Budget Tool.....	20
3	Installation Procedures.....	21
3.1	Step 1: Mounting Kits.....	21
3.1.1	Lightweight Mounting Kit.....	21
	<i>Assembly Instructions</i>	22
3.1.2	Heavy-Duty Mounting Kit.....	24
	<i>Overview</i>	24
	<i>Assembly Instructions</i>	25
3.1.3	Stand-Alone Mounting Kit.....	27
	<i>Overview</i>	27
	<i>Assembly Instructions</i>	27
3.1.4	Parabolic Mounting Kit.....	29
	<i>Overview</i>	29
	<i>Assembly Instructions</i>	29
3.2	Step 2: RF Connections.....	31
3.2.1	RF Cable Connections.....	31
3.2.2	Weatherproof the RF Connectors.....	32
3.3	Step 3: Ethernet Connections.....	34
3.3.1	Ethernet Cable and Connections.....	34

3.3.2	Assemble Weathertight Connector	34
3.3.3	Disconnecting the Ethernet Cable	35
3.3.4	Weatherproof Ethernet Port	37
3.3.5	Protecting Ethernet Cables	38
3.4	Step 4: Installing the AN-80i.....	39
3.4.1	Surge Protection Guidelines.....	39
3.4.2	Grounding Guidelines	39
3.4.3	Installing the AN-80i Equipment	40
3.4.4	Line Protector Unit Wiring	42
3.4.5	Line Protector Mast Mounting Kit	44
3.4.6	Weatherproof LP Connections	45
3.4.7	Ethernet Cable Drip Loop.....	46
3.4.8	Basic Antenna Alignment	47
	<i>Azimuth Alignment</i>	47
	<i>Elevation Alignment</i>	47
	<i>Fine Alignment</i>	47
3.5	Step 5: Install Indoor PoE Power Block.....	48
3.6	Step 6: Configure AN-80i.....	49
3.6.1	Pre-Configure Test PC.....	49
3.6.2	AN-80i Connections and Power-Up.....	49
3.6.3	AN-80i Startup and Configuration.....	49
3.6.4	Antenna Adjustment Using Web Alignment Tool	52
3.6.5	Antenna Adjustment Using Audible Tone	52
	<i>Enable Audible Tool Using Web Browser</i>	53
	<i>Enable Audible Tool Using CLI</i>	53
3.6.6	Antenna Adjustment Using RSSI.....	53
3.6.7	Installation Procedure for DFS-Enabled Systems.....	54
	<i>Step A -- Align Site A Antenna</i>	54
	<i>Step B -- Align Site B Antenna</i>	55
3.6.8	Configure AN-80i Ethernet Network Settings	56

LIST OF TABLES

Table 1: FCC & IC RF Recommended Safe Separation Distances.....	10
Table 2: FCC: TDWR System Locations.....	12
Table 3: Site Path Profile Data	16
Table 4: System Components Available from Redline	17
Table 5: Installation - Customer-Supplied Items	18
Table 6: Network Parameters	19
Table 7: Lightweight Mounting Bracket - Parts List	22
Table 8: Heavy Duty Mounting Bracket - Parts List.....	25
Table 9: Stand-Alone Mounting Bracket - Parts List.....	27
Table 10: Parabolic Mounting Bracket - Parts List	29
Table 11: RF Connector Torque Specifications	31
Table 12: Ethernet Line Protector - Wiring Diagram.....	42
Table 13: Ethernet Line Protector - Mounting Kit Parts List.....	44
Table 14: Configuration - Default System PTP Settings.....	50
Table 15: Configuration - Settings for Antenna Alignment (DFS) - Step 1.....	54
Table 16: Settings for Antenna Alignment (DFS) - Step 2.....	55

LIST OF FIGURES

Figure 1: Notices - WEEE Logo.....	13
Figure 2: AN-80i System Components.....	14
Figure 3: Site Survey - Fresnel Zone Radius	15
Figure 4: Site Survey - Non-Line of Sight Deployment.....	16
Figure 5: Installation - Redline Supplied Components	17
Figure 6: Site Survey - Sample Link Budget Calculation.....	20
Figure 7: Lightweight Antenna Mounting Bracket.....	21
Figure 8: Lightweight Mounting Bracket - Assembled View.....	22
Figure 9: Lightweight Mounting Bracket - Assembly Drawing	23
Figure 10: Heavy-Duty Antenna Bracket.....	24
Figure 11: Heavy Duty Mounting Bracket - Assembled View	25
Figure 12: Heavy Duty Mounting Bracket - Assembly Drawing	26
Figure 13: Stand-Alone Mounting Bracket	27
Figure 14: Stand-Alone Mounting Bracket - Assembly Drawing	28
Figure 15: Parabolic Mounting Bracket - Parts List	29
Figure 16: Parabolic Mounting Bracket - Assembly Drawing.....	30
Figure 17: Weatherproof Ethernet Port - Assembly Drawing.....	31
Figure 18: Weatherproofing - RF Cable Pt-1.....	32
Figure 19: Weatherproofing - RF Cable Pt-2.....	32
Figure 20: Weatherproofing - RF Cable Pt-3.....	33
Figure 21: Weatherproofing - RF Cable Pt-4.....	33
Figure 22: Ethernet Port Weatherproof Connector.....	34
Figure 23: Weatherproof Ethernet Port - Assembly Drawing.....	35
Figure 24: Weatherproof Ethernet Port - Ethernet Cable Locking Tab	36
Figure 25: Weatherproof Ethernet Port - Disconnecting the Ethernet Cable	36
Figure 26: Weatherproofing - Ethernet Cable Pt-1	37
Figure 27: Weatherproofing - Ethernet Cable Pt-2.....	37

Figure 28: Weatherproofing - Ethernet Cable Pt-3.....	37
Figure 29: Outdoor Cable Protection - Spiroband.....	38
Figure 30: Mounting - Grounding & Surge Protection.....	40
Figure 31: Mounting - Air Terminal for Tower and Pole Deployments.....	41
Figure 32: Ethernet Line Protector - Identifying Terminal Connectors.....	43
Figure 33: Ethernet Surge Protection - Mast Mounting Kit.....	44
Figure 34: Weatherproofing - LP Ethernet Cable Entry - Pt-1.....	45
Figure 35: Weatherproofing LP Ethernet Cable Entry - Pt-2.....	45
Figure 36: Weatherproofing LP Ethernet Cable Entry - Pt-3.....	45
Figure 37: Mounting - Cable Drip Loop.....	46
Figure 38: Antenna Alignment - Levelling Antenna Elevation Plane.....	47
Figure 39: Intro - Indoor Power-over-Ethernet (PoE) Module - AC Model.....	48
Figure 40: Web - Login Screen.....	49
Figure 41: Configuration - Options Key.....	50
Figure 42: Configuration - Spectrum Sweep.....	51
Figure 43: Configuration - RSSI Statistics.....	52
Figure 44: Configuration - Antenna Alignment (DFS) - Step 1.....	55
Figure 45: Configuration - Antenna Alignment (DFS) - Step 2.....	56

Chapter

1

1 Safety & Service Notices

1.1 Safety Warnings

1. Lightning/Surge Protection and Grounding



WARNING to Service Personnel

The system must be installed by a professional installer who is familiar with both data network issues and RF installations including grounding and surge protection.

The system must be properly grounded to protect against power surges and accumulated static electricity. It is the user's responsibility to install this device in accordance with the local electrical codes: correct installation procedures for grounding of the modem, mast, lead-in wire and line protection, location of line protection, size of grounding conductors and connection requirements for grounding electrodes.



PoE power adapter caution:

Warning to Service Personnel: 48 VDC

Customer equipment including personal computers, routers, etc., must be connected only to the INPUT (DATA) port on the PoE unit.

Only the outdoors Ethernet interface cable connecting to the unit can be safely connected to the OUTPUT (DATA & POWER) connector. Connecting customer premises Ethernet equipment directly to the OUTPUT (DATA & POWER) connector on the Power-over-Ethernet power adapter may damage customer equipment.

2. Installation of the system must be contracted to a professional installer.
3. Read this user manual and follow all operating and safety instructions.
4. Keep all product information for future reference.
5. The power requirements are indicated on the product-marking label. Do not exceed the described limits.
6. Disconnect the power before cleaning. Use only a damp cloth for cleaning. Do not use liquid or aerosol cleaners.
7. Disconnect power when unit is stored for long periods.
8. The unit must not be located near power lines or other electrical power circuits.
9. The system must be properly grounded to protect against power surges and accumulated static electricity. It is the user's responsibility to install this device in accordance with the local electrical codes: correct installation procedures for grounding the unit, mast, lead-in wire and discharge unit, location of discharge unit, size of grounding conductors and connection requirements for grounding electrodes.

1.2 Warning Symbols

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



Electro-Magnetic Radiation



High Voltage

1.3 Service & Warranty Information

1. Refer all repairs to qualified service personnel. Do not remove the covers or modify any part of this device, as this action will void the warranty.
2. Locate the serial numbers and record these on your registration card for future reference. Use the space below to affix serial number stickers. Also, record the MAC address identified on the unit product label.
3. Redline does not endorse or support the use of outdoor cable assemblies: i) not supplied by Redline, ii) third-party products that do not meet Redline's cable and connector assembly specifications, or iii) cables not installed and weatherproofed as specified in the Installation Guidelines manual (70-00073-01-XX). Refer to the Redline Limited Standard Warranty and RedCare service agreements.

1.4 Lightning/Surge Protection

WARNING: This user manual provides notes are general recommendations for the system. The wireless equipment should be installed by a qualified professional installer who is knowledgeable of and follows local and national codes for electrical grounding and safety. Failure to meet safety requirements and/or use of non-standard practices and procedures could result in personal injury and damage to equipment.

All outdoor wireless equipment is susceptible to lightning damage from a direct hit or induced current from a near strike. A direct lightning strike may cause serious damage even if these guidelines are followed. Surge protection and grounding practices in local and national electrical codes serve to minimize equipment damage, Service outages, and serious injury. Reasons for lightning damage are summarized as:

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

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

A good grounding system disperses most of the surge energy from a lightning strike away from the building and equipment. The remaining energy on the Ethernet cable shield and conductors can be directed safely to ground by installing a surge arrestor in series with the cable.


If you have determined that it is appropriate to install surge protection for your system, the following general industry practices are provided as a guideline only:

1. The AC wall outlet ground for the indoor POE adapter should be connected to the building grounding system.
2. Install a surge arrestor in series with the Ethernet cable at the point of entry to the building. The grounding wire should be connected to the same termination point used for the tower or mast.
3. Provide direct grounding connections from the mounting bracket, the antenna, and the Ethernet cable surge protection to the common building ground bus. Use the grounding screws provided for terminating the ground wires.

1.5 Deployment in the USA and Canada

1.5.1 FCC & IC Notices

1. The Model AN-80i and its antenna must be professionally installed.

2.  **WARNING** -- FCC & IC RF Exposure Warnings

To satisfy FCC and IC RF exposure requirements for RF transmitting devices, the following distances should be maintained between the antenna of this device and persons during device operation:

Table 1: FCC & IC RF Recommended Safe Separation Distances		
Frequency (GHz)	Mode	Separation Distance
3.3 - 3.8	PTP / PMP	130 cm (52 in) or more
4.9 - 5.3	PTP / PMP	255 cm (101 in) or more
5.4	PTP / PMP	40 cm (16 in) or more
5.8	PMP	20 cm (8 in) or more
	PTP	310 cm (122 in) or more

To ensure compliance, operation at closer than these distances is not recommended. The antenna used for this transmitter must not be collocated in conjunction with any other antenna or transmitter.

3. High power radars are allocated as primary users (meaning they have priority) of 5.250-5.350 MHz and 5.650-5.850 GHz and these radars could cause interference and/or damage to LE-LAN devices.
4. FCC Information to Users @ FCC 15.105:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Where DFS is required by regional regulations, this function is permanently enabled at the factory and can not be disabled by the installer or end-user.

5. FCC Information to Users @ FCC 15.21:

Warning: Changes or modifications not expressly approved by Redline Communications could void the user's authority to operate the equipment.

1.5.2 Installation and Operation

USA

FCC Part 90 guidelines for deployment of AN-80i systems in the frequency band of 3.650-3.700 GHz for “restricted” CBP (Contention Based Protocol) in USA includes restrictions on the maximum EIRP.

To comply with the above guidelines, the following EIRP limitations are applied for deployment in this band:

- i) Max EIRP of 25 Watts/25 MHz (equivalent to 1 Watt/1 MHz)
- ii) Peak EIRP Power Density of 1 Watt in any 1 MHz slice of spectrum.

To ensure compliance with these restrictions, see the following important notices:

1. The AN-80i outdoor transceiver and antenna must be professionally installed.
2. The 3.650-3.700 GHz (USA) and 3.450-3.650 GHz (CAN) frequency ranges are licensed bands and operators must have a valid spectrum license to operate AN-80i equipment using these bands.
3. The AN-80i requires a Redline FCC-specific options key that is mandatory for operation within the USA. This options key enforces the FCC approved operating range of 3.650-3.675 GHz. Do not operate an AN-80i outdoor transceiver until you have confirmed the FCC-specific options key is loaded and active (operating range restricted to 3.650-3.675 GHz). When the FCC-specific options key is installed, the operator is not able to set an RF frequency that exceeds the allowed range of 3.650-3.675 GHz.
4. The AN-80i transmit power settings must not exceed values stated in the AN-80i User Manual.
5. Changes or modifications not expressly approved by Redline Communications could void the user’s authority to operate the equipment.

Canada

IC regulations governing operation in the 3.450-3.650 GHz band are subject to licensing, pursuant to subsection 4(1) of the Radiocommunication Act.

1.5.3 Power Settings

USA

FCC regulation part 90.1321 (governing operation in the 3.650-3.700 GHz band in the US) states that base station transmissions are limited to a maximum transmit power of 1 Watt/MHz (peak EIRP).

Canada

IC regulations governing operation in the 3.450-3.650 GHz band states that base station transmissions are limited to a maximum transmit power of 1 Watt/MHz (peak EIRP).

1.5.4 Recommendations to UNII band Users

Redline, in complete cooperation with the FCC, strongly recommends the operators of this equipment in the UNII band to deploy following these guidelines:

1. Avoid operation in the TDWR band of 5600-5650 MHz.
2. Review the following table of Terminal Doppler Weather Radar (TDWR) system locations.
3. Operate at least 30 MHz away from the TDWR operation frequencies when installing devices within 22 miles (35 km) or in line-of-sight of a TDWR site.

Table 2: FCC: TDWR System Locations

STATE	CITY	LONGITUDE	LATITUDE	FREQUENCY	TERRAIN ELEVATION (MSL) [ft]	ANTENNA HEIGHT ABOVE TERRAIN [ft]
AZ	PHOENIX	W 112 09 46	N 33 25 14	5610 MHz	1024	64
CO	DENVER	W 104 31 35	N 39 43 39	5615 MHz	5643	64
FL	FT LAUDERDALE	W 080 20 39	N 26 08 36	5645 MHz	7	113
FL	MIAMI	W 080 29 28	N 25 45 27	5605 MHz	10	113
FL	ORLANDO	W 081 19 33	N 28 20 37	5640 MHz	72	97
FL	TAMPA	W 082 31 04	N 27 51 35	5620 MHz	14	80
FL	WEST PALM BEACH	W 080 16 23	N 26 41 17	5615 MHz	20	113
GA	ATLANTA	W 084 15 44	N 33 38 48	5615 MHz	962	113
IL	MCCOOK	W 087 51 31	N 41 47 50	5615 MHz	646	97
IL	CRESTWOOD	W 087 43 47	N 41 39 05	5645 MHz	663	113
IN	INDIANAPOLIS	W 086 26 08	N 39 38 14	5605 MHz	751	97
KS	WICHITA	W 097 26 13	N 37 30 26	5603 MHz	1270	80
KY	COVINGTON CINCINNATI	W 084 34 48	N 38 53 53	5610 MHz	942	97
KY	LOUISVILLE	W 085 36 38	N 38 02 45	5646 MHz	617	113
LA	NEW ORLEANS	W 090 24 11	N 30 01 18	5645 MHz	2	97
MA	BOSTON	W 070 56 01	N 42 09 30	5610 MHz	151	113
MD	BRANDYWINE	W 076 50 42	N 38 41 43	5635 MHz	233	113
MD	BENFIELD	W 076 37 48	N 39 05 23	5645 MHz	184	113
MD	CLINTON	W 076 57 43	N 38 45 32	5615 MHz	249	97
MI	DETROIT	W 083 30 54	N 42 06 40	5615 MHz	656	113
MN	MINNEAPOLIS	W 092 55 58	N 44 52 17	5610 MHz	1040	80
MO	KANSAS CITY	W 094 44 31	N 39 29 55	5605 MHz	1040	64
MO	SAINT LOUIS	W 090 29 21	N 38 48 20	5610 MHz	551	97
MS	DESOTO COUNTY	W 089 59 33	N 34 53 45	5610 MHz	371	113
NC	CHARLOTTE	W 080 53 06	N 35 21 39	5608 MHz	807	113
NC	RALEIGH DURHAM	W 078 41 50	N 36 00 07	5647 MHz	400	113
NJ	WOODBIDGE	W 074 16 13	N 40 35 37	5620 MHz	19	113
NJ	PENNSAUKEN	W 075 04 12	N 39 56 57	5610 MHz	39	113
NV	LAS VEGAS	W 115 00 26	N 36 08 37	5645 MHz	1995	64
NY	FLOYD BENNETT FIELD	W 073 52 49	N 40 35 20	5647 MHz	8	97
OH	DAYTON	W 084 07 23	N 40 01 19	5640 MHz	922	97
OH	CLEVELAND	W 082 00 28	N 41 17 23	5645 MHz	817	113
OH	COLUMBUS	W 082 42 55	N 40 00 20	5605 MHz	1037	113
OK	AERO. CTR TDWR #1	W 097 37 31	N 35 24 19	5610 MHz	1285	80
OK	AERO. CTR TDWR #2	W 097 37 43	N 35 23 34	5620 MHz	1293	97
OK	TULSA	W 095 49 34	N 36 04 14	5605 MHz	712	113
OK	OKLAHOMA CITY	W 097 30 36	N 35 16 34	5603 MHz	1195	64
PA	HANOVER	W 080 29 10	N 40 30 05	5615 MHz	1266	113
PR	SAN JUAN	W 066 10 46	N 18 28 26	5610 MHz	59	113
TN	NASHVILLE	W 086 39 42	N 35 58 47	5605 MHz	722	97
TX	HOUSTON INTERCONTL	W 095 34 01	N 30 03 54	5605 MHz	154	97
TX	PEARLAND	W 095 14 30	N 29 30 59	5645 MHz	36	80

Additional information:

<http://spectrumbridge.com/udrs/home.aspx>

http://www.wispa.org/?page_id=2341

1.5.5 UL Information

1. The suitability of the supplied Ethernet cable is subject to the approval of Authority Having Jurisdiction and must comply with the local electrical code.
2. The equipment must be properly grounded according with NEC and other local safety code and building code requirements
3. To meet the over-voltage safety requirements on the telecommunications cables, a minimum 26 AWG telecommunication line cord must be used.
4. "Pour être en conformance avec les exigences finies de sûreté de sur-tension sur les câbles de télécommunications un fil de télécommunication ayant un calibre minimum de 26 AWG doit être utilisé."
5. Reminder to all the BWA system installers: Attention to Section 820-40 of the NEC which provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as is practical.
6. AN-80i must be installed in compliance with relevant articles in National Electrical Code-NEC (and equivalent Canadian Code-CEC) including referenced articles 725, 800 and 810 in NEC.
7. RF coaxial cable connecting an antenna to the AN-80i must comply with the local electrical code.

1.5.6 WEEE Product Return Process



Figure 1: Notices - WEEE Logo

In accordance with the WEEE (Waste from Electrical and Electronic Equipment) directive, 2002/96/EC, Redline Communications equipment is marked with the logo shown above. The WEEE directive seeks to increase recycling and re-use of electrical and electronic equipment. This symbol indicates that this product should not be disposed of as part of the local municipal waste program. Contact your local sales representative for additional information.

2 Site Survey Information

Before the installation of the equipment, a site survey should be completed and this data should be available to the installation team. This data will assist the installer to correctly install the AN-80i, and to understand the operating characteristics of the AN-80i system during configuration and testing.

2.1 Introduction

The Access Node 80i system is made by Redline Communications -- a world leader in design and production of Broadband Fixed Wireless (BFW) systems.

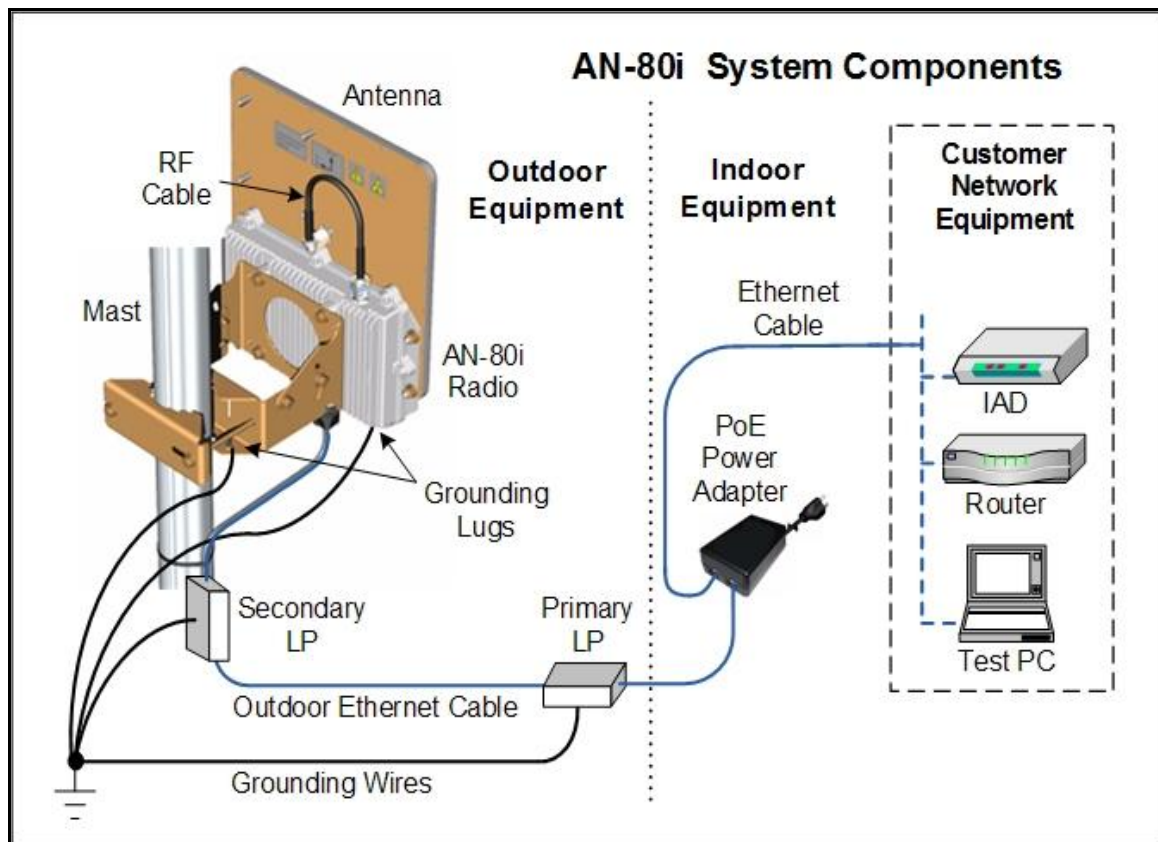


Figure 2: AN-80i System Components

The AN-80i is a high-performance, high-speed wireless Ethernet bridge for use in a commercial, industrial, business, or government environment. The system can operate with a 3.3 - 3.8 GHz, 4.9 - 5.3 GHz, 5.4 GHz, or 5.8 GHz radio (factory installed) using a time division duplexing (TDD) RF transceiver to transmit and receive on the same channel. Main features include advanced technologies to address inter-cell interference, enhanced security features through over-the-air encryption schemes, and Automatic Transmitter Power Control (ATPC) to automatically maintain optimum performance.

The outdoor unit can be used with a selection of available external antennas. When equipped with a narrow beam antenna, the AN-80i supports long-range operations of over 50 miles (80 km) in clear line of sight (LOS) conditions. The AN-80i outdoor unit is housed in a weatherproof aluminum alloy case. An indoor PoE power adapter provides operational power for the AN-80i and connection to the Ethernet network.

One AN-80i is configured as PTP Master or PMP Sector Controller and controls the wireless link. This function is transparent to all Ethernet operations. The Master/sector controller uses a scheduled request/grant mechanism to arbitrate bandwidth requests from the remote unit (PTP Slave / PMP subscriber) to provide non contention-based traffic with predictable transmission characteristics.

2.2 RF Interference

Frequency planning is an essential component of installation and it is very important to test for RF interference at every installation site. The AN-80i will not achieve full operational capability if there is excessive interference on the same or adjacent RF channels.

RF interference may be caused by another wireless system operating on the same or adjacent RF channels. A simple test may be performed using the AN-80i built-in spectrum sweep feature to determine if a selected RF channel is generally free from interference. This procedure is described in the configuration section of this manual.

2.3 Path Profile

The site survey should identify the optimum location for mounting the AN-80i. For maximum performance, there should be a direct line of sight to the receiving wireless system.

The antenna should be positioned to provide maximum clearance within the first Fresnel zone of the direct path (as high as possible, on either a tall building or tower). A clear line-of-sight (LOS) path requires clearance above natural and man-made objects by at least 60% of the First Fresnel zone.

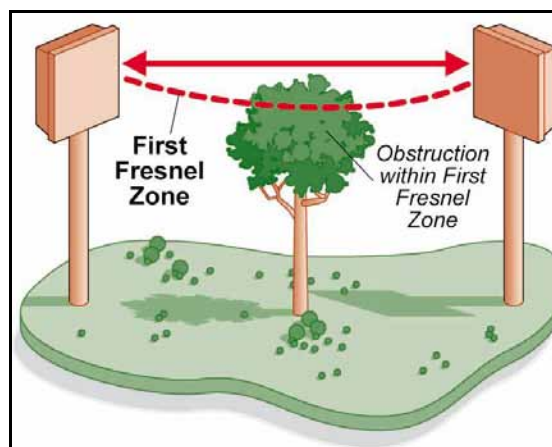


Figure 3: Site Survey - Fresnel Zone Radius

The AN-80i will also function under optical line-of-sight (OLOS) conditions; where a clear straight line path exists between the two end points, but the first Fresnel zone is not clear. If the optical path is completely blocked, it may still be possible to establish a non line-of-sight (NLOS) path using reflections and diffraction. A satisfactory multipath RF signal may be obtained by directing both AN-80i antennas towards a reflective structure that is within sight of both units.

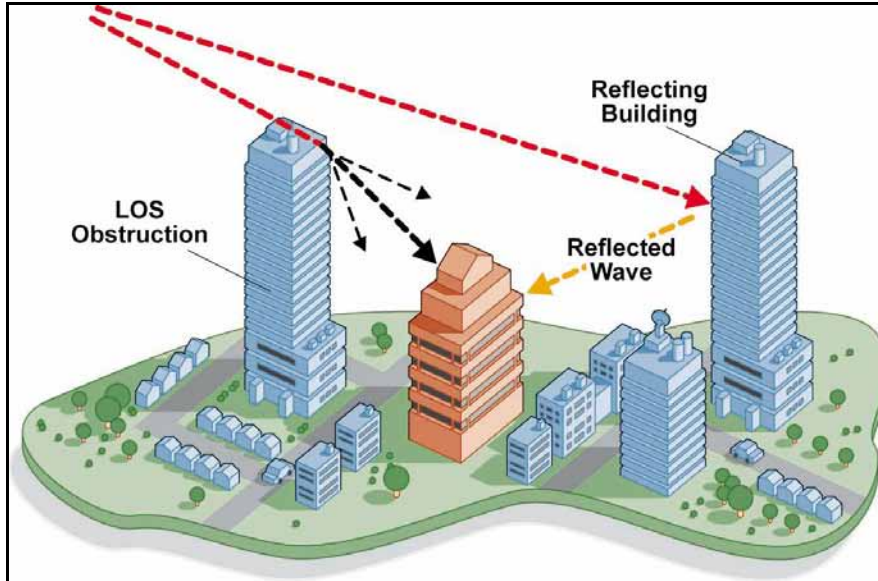


Figure 4: Site Survey - Non-Line of Sight Deployment

The path profile should include the following information:

Table 3: Site Path Profile Data	
Antenna	Description
Location	Instructions to identify the location for installing the antenna. May include blueprints and specify material list.
Height	Mounting height for antenna.
Azimuth	Horizontal aiming direction for the antenna (magnetic or GPS compass)
Elevation angle	Vertical aiming for antenna (spirit level).
Expected RSSI	Use the Link Budget tool to determine the expected receive signal strength indication (RSSI).

The expected RSSI value can be determined using the Link Budget Tool from Redline Communications Inc. See the following section for more details.

2.4 Overview

The components in the following illustration are supplied with each AN80i system.



Figure 5: Installation - Redline Supplied Components

Table 4: System Components Available from Redline	
#	Description
1	AN-80i radio.
2,3,4,5	Mounting kit for AN-80i. All kits include RF jumper cable. Lightweight mount includes mounting bracket with assembly hardware. Adjusts for 44.5 to 117.3 mm (1.75 to 4.62 in) mast. Includes 228 mm (9 in) RF cable. Heavy-duty mount includes mounting bracket with assembly hardware. Fits 44.5 to 117.3 cm (1.75 to 4.62 in) mast. Includes 400 mm (16 in) RF cable. Stand-alone mount includes adapter bracket with assembly hardware and clamps. Fits 70 to 120 mm (2.75 to 4.75 in) mast. Includes 400 mm (16 in) RF cable.
6	Sector antennas (flat panel).
7	Subscriber antennas (flat panel and parabolic).
8	Line protection (LP) unit for Ethernet cable (install where cable enters building).
9	Cat-5e shielded outdoor Ethernet cable terminated with RJ-45 connector each end.
10	PoE power injector with single AC 110/220 VAC input, single 10/100 Ethernet data port, plus single 10/100 powered Ethernet port.
11	Power cord for AC type PoE power injector only. The AC power cord must be ordered separately from the PoE.
12	AN-80i Quick Start Guide

2.5 Customer Supplied Materials

Installation of the AN-80i equipment requires additional equipment and materials supplied by the customer. The following list is provided as a guideline only, and additional materials may be required based on local conditions at each installation site. This list is not comprehensive and is provided as a guide only.

Table 5: Installation - Customer-Supplied Items		
#	Item	Description
1.	Equipment Rack	Mounting space allocated for the PoE power adapter. Must accommodate 2 m (6') AC power cable and routing of Ethernet cable from PoE to local Ethernet network access point.
2.	120/240 VAC Power	Reliable 120/240 VAC. Total power requirements must be evaluated based on individual site configurations.
3.	Cat-5 Ethernet Cables	Connect from PoE power adapter to core network.
4.	Cable Installation Materials	Materials for securing cables to mast, protecting cables from abrasion, etc. including suggested weatherproofing materials: Scotch 2200 series of vinyl mastic rolls Scotch 130C linerless rubber splicing tape 3M Scotch super 88 electrical tape Rubber mastic putty or duct sealing putty
5.	Radio/Antenna Mast	Mast or tower location as required by site survey. Equipment must be rated for weight and wind loading of all installed radios and antennas.
6.	Ground Block	Termination for grounding and shield of all conductive cables entering the building.
7.	Grounding Wire	Master grounding system for all indoor and outdoor equipment, with #2 AWG through #6 AWG as required and eye-terminals for connection to AN-80i chassis and mounting bracket.
8.	Tools	i) Precision set of screwdrivers, cutter pliers, and other common installation tools. ii) Portable computer (Windows™) for AN-80i configuration, antenna alignment, and troubleshooting as required.

2.6 Network Information

Following installation, each AN-80i must be configured for operation with a local Ethernet network. Contact your network system administrator for details.

Table 6: Network Parameters	
Setting	Description
IP Address	IP address for the AN-80i management.
IP Subnet Mask	IP subnet mask for the AN-80i management.
Default Gateway Address	IP address of the default router/gateway.
Flow Control Enable	Enable/disable 802.3x flow control.
Ethernet Mode	Speed and duplex options.
SNMP Enable	Enable/disable SNMP and configure community names, permissions and trap addresses.

2.7 Link Budget Tool

Identifying potential mounting locations will determine RF path and link distances. The Link Budget Tool developed by Redline will calculate the expected link performance for a specified range based on the selection of RF channel, power gain, antenna height, etc. This is useful to determine if a proposed location is suitable for the intended application.

The screenshot shows the Redline Link Budget Tool v1.23 interface. It is divided into several sections for configuring a link budget calculation:

- Transmitter:**
 - Frequency: 3300 - 3800 MHz
 - ODU Tx Power: 23 dBm
 - Tx Antenna Gain: 17 dBi
 - Tx Implementation Loss: 0.5 dB
 - EIRP: 39.5 dBm
- Propagation:**
 - Range: 10.00 miles
 - Path Loss: 127.54 dB
- Link Profile:**
 - Modulation / Coding Rate: 16QAM 3/4
 - Minimum Required SINADR: 15.5 dB
 - Uncoded Burst Rate: 36 Mb/s
 - Max Unidirectional Throughput: 32.6 Mb/s
- Receiver:**
 - Receiver Antenna Gain: 20 dBi
 - Rx Implementation Loss: 0.5 dB
 - RSSI: -68.54 dBm
 - Threshold at BER = 10⁻⁹: -80 dBm
 - Available Margin: 11.46 dB
- Antenna Options:**
 - BS (Base Station): Antenna Height (ft) 51.15, Antenna Gain (dB) 60° sector, Estimated Tilt (°) 0
 - SS (Subscriber Station): Antenna Height (ft) 51.15, Antenna Gain (dB) 1' flat panel, Estimated Tilt (°) 0
- Fade Margin Options:**
 - Calculated Fade Margin: 3.52 dB
 - Manually specify fade margin
 - Note: Fade margin calculation does not include severe ducting effects
- Wireless Options:**
 - Pathloss Model: Line of Sight
 - Channel Bandwidth (MHz): 20.0
 - Buttons: Auto Rate, Auto Range
- Program Options:**
 - Measurement Units: Imperial, Metric
 - Disable Automatic Tx Power Adjustment
 - Disable Automatic Antenna Heights
 - Calculator button

Figure 6: Site Survey - Sample Link Budget Calculation

3 Installation Procedures

3.1 Step 1: Mounting Kits

Assemble the mounting bracket (lightweight, heavy-duty, or stand-alone) using the instructions in this section. Confirm that the mounting bracket adjusts correctly to the diameter of the mast.



Important: Antenna Polarization

The same antenna polarization must be used for both AN-80i units in a PTP link and all units in a PMP deployment. The arrows on the rear of the antenna indicate the polarization.

3.1.1 Lightweight Mounting Kit

The lightweight mounting kit general-purpose adapter allows the AN-80i to be mounted on a mast pipe or flat surface. This bracket can be used with Redline flat panel antennas that mount directly to the radio or with antennas that are mounted separately (e.g., parabolic antenna).

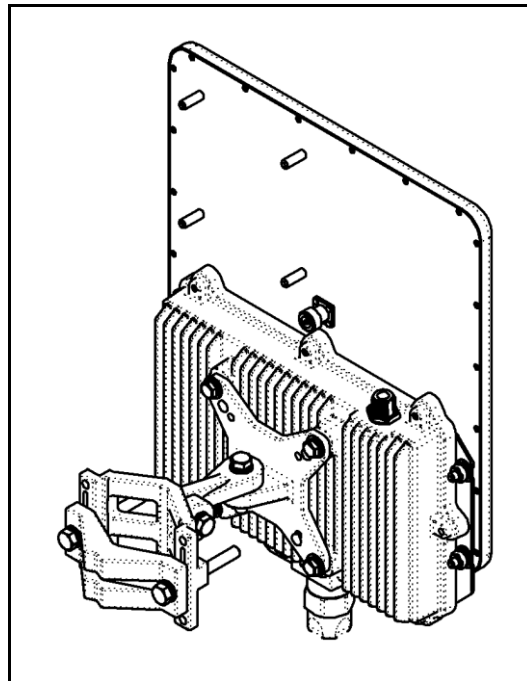


Figure 7: Lightweight Antenna Mounting Bracket

The lightweight installation kit includes:

1. Universal mounting bracket with assembly hardware. Bracket adjusts for a 44.5 to 76.2 mm (1.75 to 3.00 in) mast pipe or mounts directly to a flat surface. Assembly is required.
2. One 406 mm (16 in) RF jumper cable (N-type connectors, 50 Ohm).

Assembly Instructions

When using the lightweight mounting bracket:

1. Assemble the lightweight mounting bracket
2. Attach the AN-80i directly to the antenna. Use the same polarity for all AN-80i units on the link.
3. Attach the assembled lightweight mounting bracket to the AN-80i.

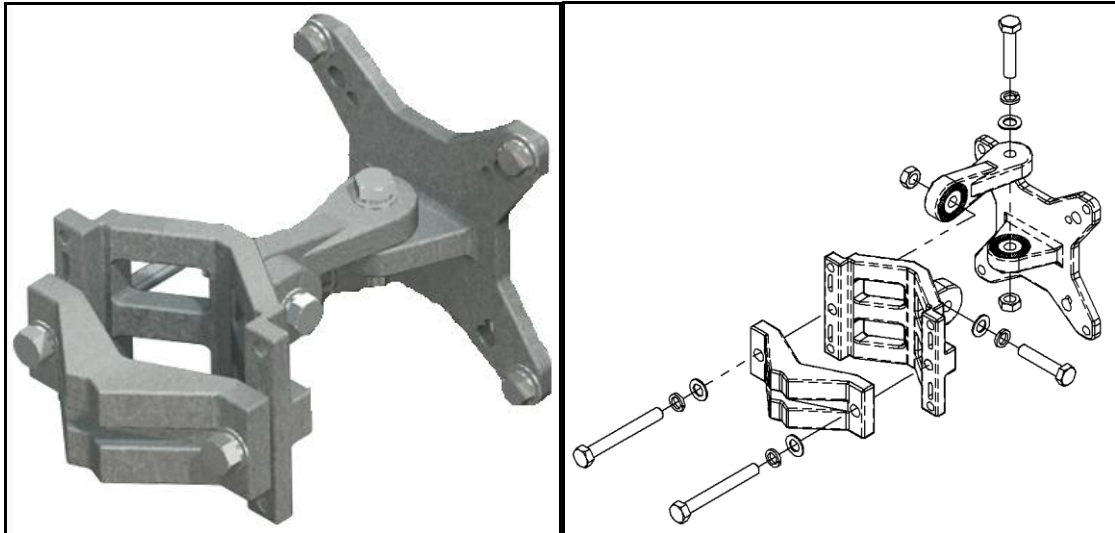


Figure 8: Lightweight Mounting Bracket - Assembled View

Table 7: Lightweight Mounting Bracket - Parts List			
ITEM	QTY.	PART NO./DESCRIPTION	TORQUE
1	1	23-00008-00 ASSY, AN-80i	
2	1	29-00094-00 MOUNT BRACKET KIT	
3	1	48-00021-02 ANTENNA	
4	4	60-00016-00 BOLT, 1/4-20 UNC X 3/4"	10 ft. lb.
5	4	60-00058-00 NUT, 1/4-20 UNC	10 ft. lb.
6	8	60-00087-00 WASHER, FLAT, 1/4"	
7	8	60-00105-00 LOCK WASHER, 1/4"	

* The AN-80i (1) and antenna (3) are not included in the mounting bracket kit.

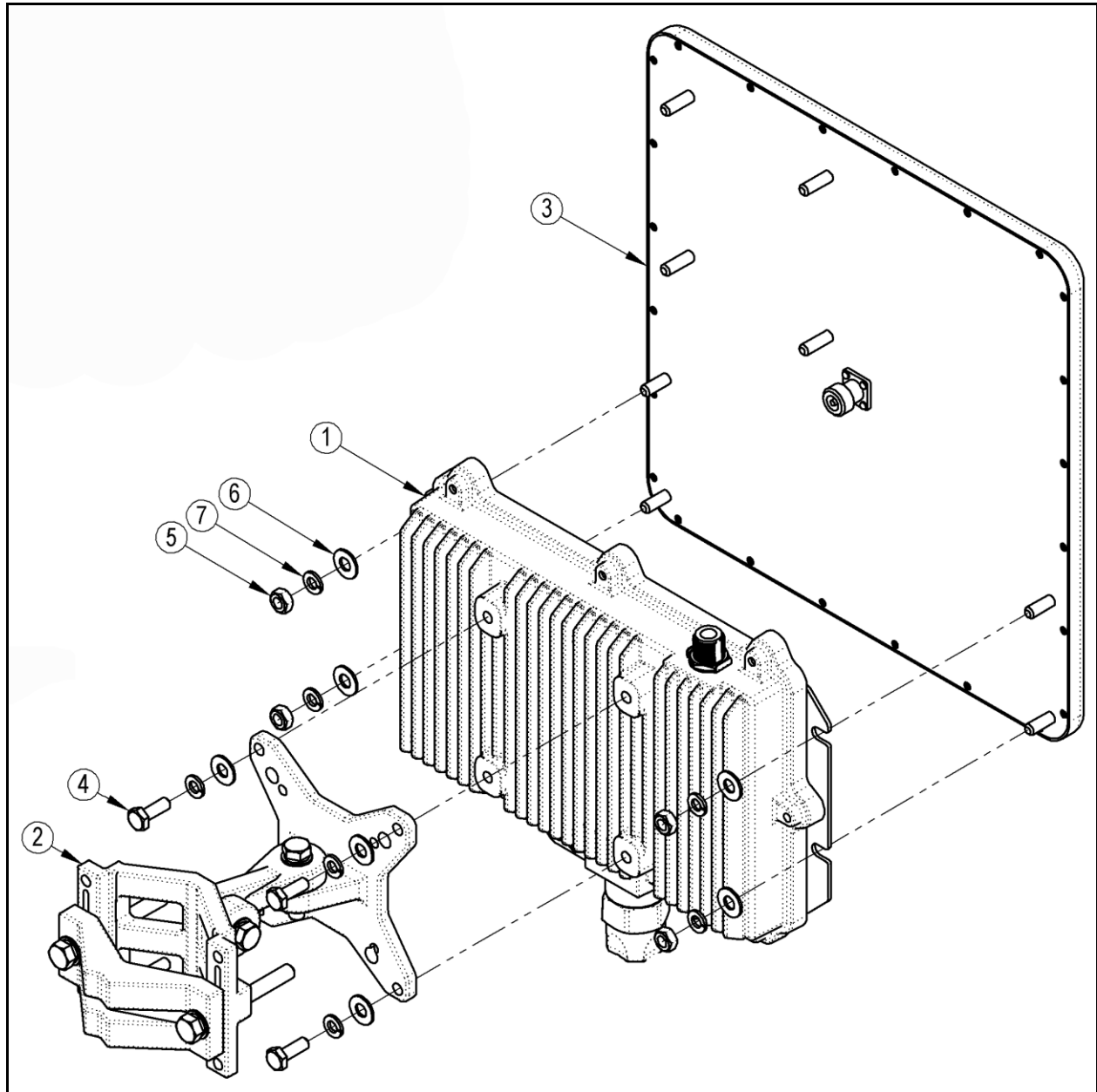


Figure 9: Lightweight Mounting Bracket - Assembly Drawing

3.1.2 Heavy-Duty Mounting Kit

Overview

The AN-80i heavy-duty system provides a 4-point system for increased reliability. The heavy-duty bracket may be used with 305 mm (1 ft) or 600 mm (2 ft) square antennas where the AN-80i is installed on towers or similar locations.

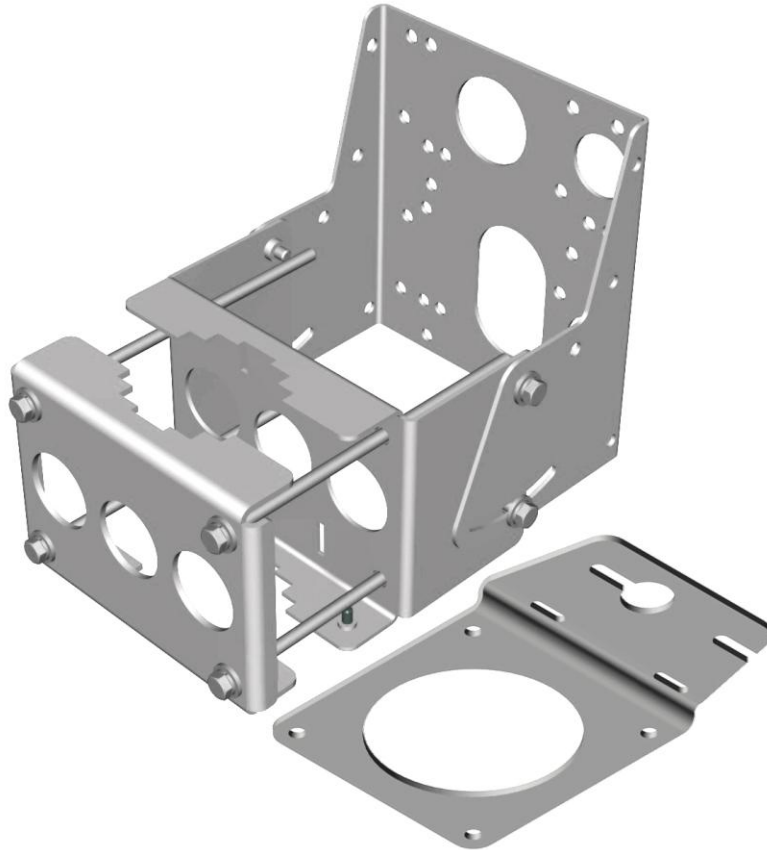


Figure 10: Heavy-Duty Antenna Bracket

The heavy-duty installation kit (80i-HD-MNT) includes:

1. Heavy duty antenna mounting bracket with assembly hardware: adjusts for 44.5 to 117.3 mm (1.75 to 4.62 in) mast pipe (assembly required).
2. Adapter bracket to attach the AN-80i to the heavy duty mounting bracket.
3. RF jumper cable (N-type connectors, 50 Ohm).

Assembly Instructions

When using the heavy duty mounting bracket:

1. Assemble the heavy duty mounting bracket
2. Attach the antenna directly to mounting bracket. Use the same polarity for all AN-80i units on the link.
3. Attach the AN-80i to the antenna bracket using the adapter bracket (8).

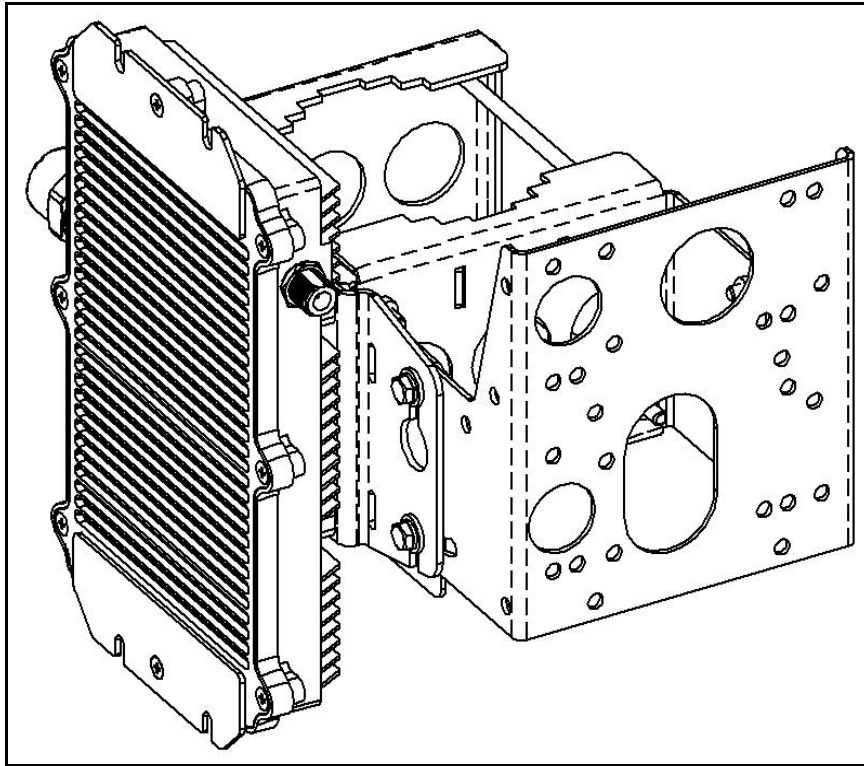


Figure 11: Heavy Duty Mounting Bracket - Assembled View

Table 8: Heavy Duty Mounting Bracket - Parts List

ITEM	QTY.	PART NO./DESCRIPTION	TORQUE
1	1	20-00008-00 ASSY, AN-80i*	
2	1	WASHER, SLIT *	
3	1	CABLE GLAND SEAL*	
4	1	CABLE GLAND NUT *	
5	1	50-00320-01 BRACKET, ANTENNA	
6	1	50-00358-00 BRACKET, MAST	
7	1	50-00322-00 BRACKET, MAST CLAMP	
8	1	50-00527-01 BRACKET, ADAPTER	
9	8	60-00016-00 BOLT, 1/4-20 UNC X 3/4	10 ft. lb.
10	12	60-00105-00 LOCKWASHER, 1/4, SPLIT	
11	12	60-00087-00 WASHER, 1/4, FLAT	
12	1	60-00022-00 SCREW, 10-32 UNF X 1/2	3 ft. lb.
13	1	60-00106-00 LOCKWASHER, #10	
14	4	60-00035-00 BOLT, 1/4-20 UNC X 7	10 ft. lb.
15	1	ASSY, CABLE, PoE	

* AN-80i and PoE cable assembly not included in the mounting bracket kit.

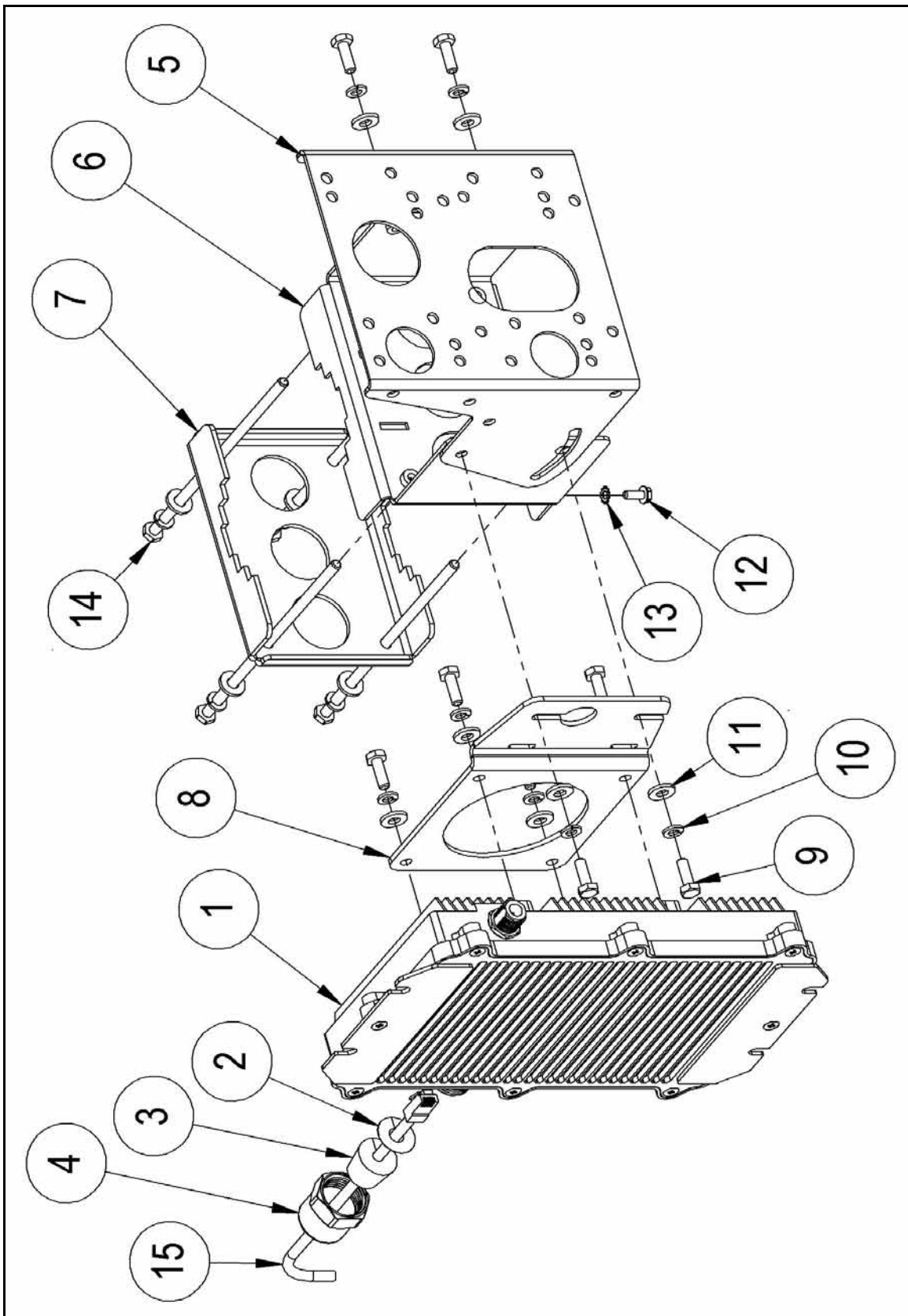


Figure 12: Heavy Duty Mounting Bracket - Assembly Drawing

3.1.3 Stand-Alone Mounting Kit

Overview

The stand-alone bracket can be used for mounting the AN-80i directly to a mast. The antenna must be mounted separately. The stand alone mounting bracket adjusts for 70 to 120 mm (2.75 to 4.75 in) mast pipe (assembly required).

The stand-alone installation kit (80i-SA-MNT) includes:

1. Adapter bracket with assembly hardware.
2. RF jumper cable (N-type connectors, 50 Ohm).

Assembly Instructions

1. Attach the stand-alone bracket to the AN-80i using the supplied materials.
2. Use the bracket to attach the AN-80i directly to a mast (or parabolic antenna mount) using the supplied adjustable metal bands (hose clamps).

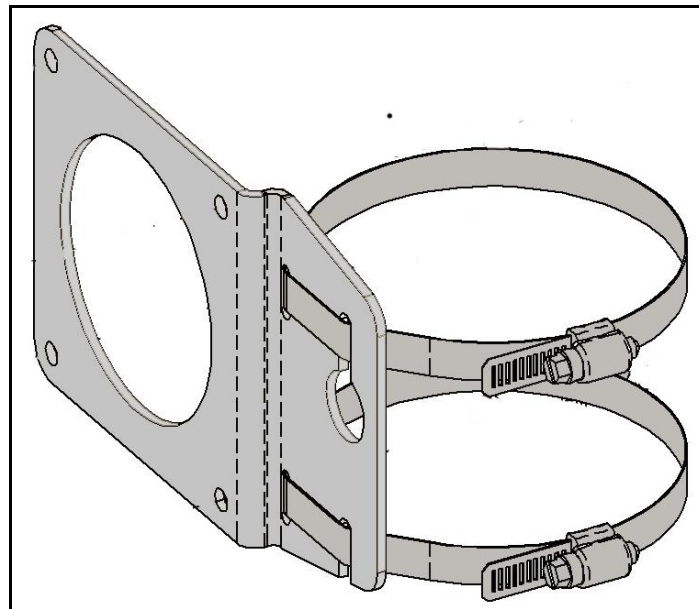


Figure 13: Stand-Alone Mounting Bracket

Table 9: Stand-Alone Mounting Bracket - Parts List

AN-80i MODULAR ASSEMBLY STAND ALONE			
ITEM	QTY.	PART NO./DESCRIPTION	TORQUE
1	1	23-00008-00 ASSY, AN-80i *	
2	1	WASHER, SLIT *	
3	1	CABLE GLAND SEAL*	
4	1	CABLE GLAND NUT *	
5	1	ASSY, CABLE, PoE *	
6	1	50-00527-01 BRACKET, ADAPTER	
7	4	60-00016-00 BOLT, 1/4-20 UNC X 3/4	10 ft. lb.
8	4	60-00105-00 LOCKWASHER, 1/4, SPLIT	
9	4	60-00087-00 WASHER, 1/4, FLAT	
10	2	60-00328-00 HOSE CLAMP, RANGE, 3-5"	

* AN-80i and PoE cable assembly not included in the mounting bracket kit.

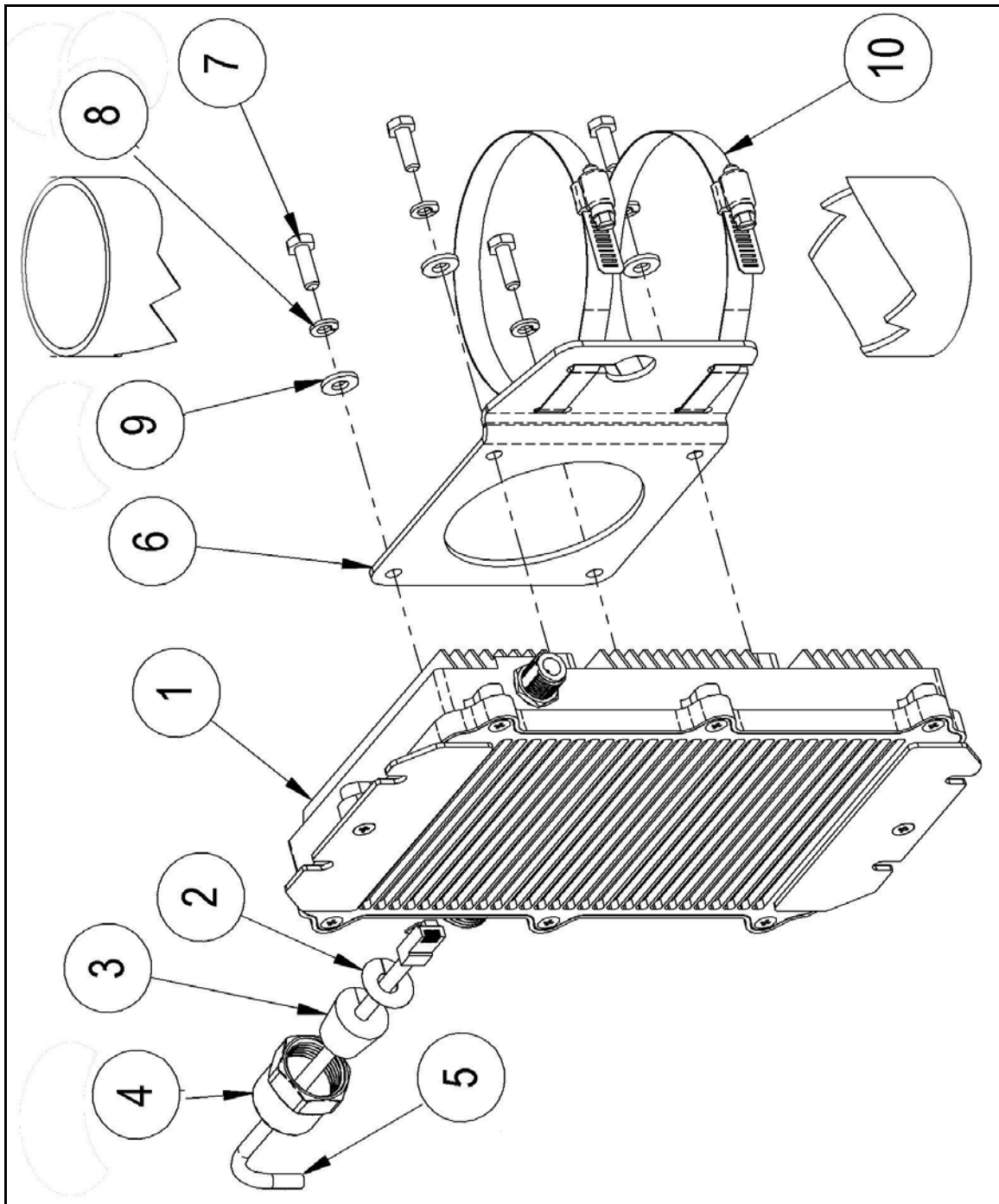


Figure 14: Stand-Alone Mounting Bracket - Assembly Drawing

3.1.4 Parabolic Mounting Kit

Overview

The heavy-duty mounting bracket (80i-HD-MNT) can be used to mount small parabolic antennas. Larger parabolic antennas will be shipped with OEM mounting brackets and instructions.

Note: Large parabolic antennas may not allow the radio to be mounted directly on the mast (due to RF cable length). In these cases, use the stand-alone AN-80i mounting bracket (AN-80i-SA-MNT) to mount the radio directly on the parabolic antenna frame or mounting bracket.

Assembly Instructions

1. Assemble the mounting bracket (without the adjustable antenna bracket).
2. Attach the AN-80i to the heavy-duty bracket using the adapter bracket (7).
3. Attach the small parabolic antenna to the heavy-duty bracket.

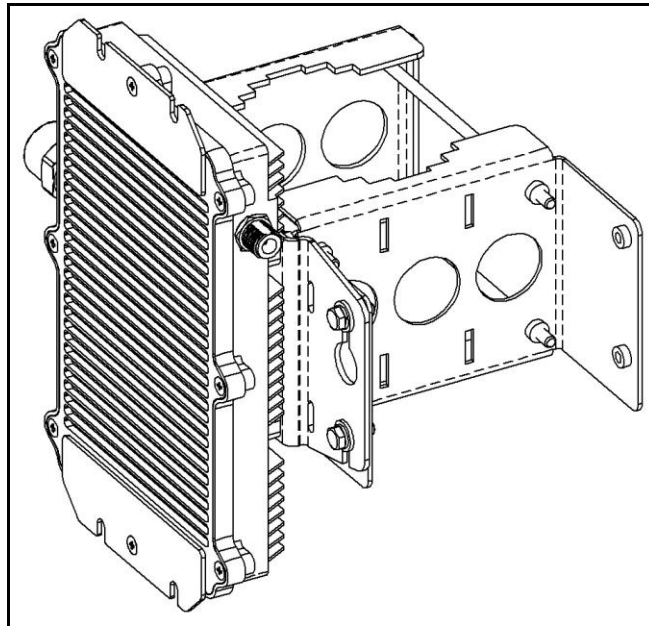


Figure 15: Parabolic Mounting Bracket - Parts List

Table 10: Parabolic Mounting Bracket - Parts List

ITEM	QTY.	PART NO./DESCRIPTION	TORQUE
1	1	20-00008-00 ASSY, AN-80i*	
2	1	WASHER, SLIT*	
3	1	CABLE GLAND SEAL*	
4	1	CABLE GLAND NUT*	
5	1	50-00358-00 BRACKET, MAST	
6	1	50-00322-00 BRACKET, MAST CLAMP	
7	1	50-00527-01 BRACKET, ADAPTER	
8	6	60-00016-00 BOLT, 1/4-20 UNC X 3/4	10 ft. lb.
9	10	60-00105-00 LOCKWASHER, 1/4, SPLIT	
10	10	60-00087-00 WASHER, 1/4, FLAT	
11	1	60-00022-00 SCREW, 10-32 UNF X 1/2	3 ft. lb.
12	1	60-00106-00 LOCKWASHER, #10	
13	4	60-00035-00 BOLT, 1/4-20 UNC X 7	10 ft. lb.
14	1	ASSY, CABLE, PoE*	

* AN-80i and PoE cable assembly not included in the mounting bracket kit.

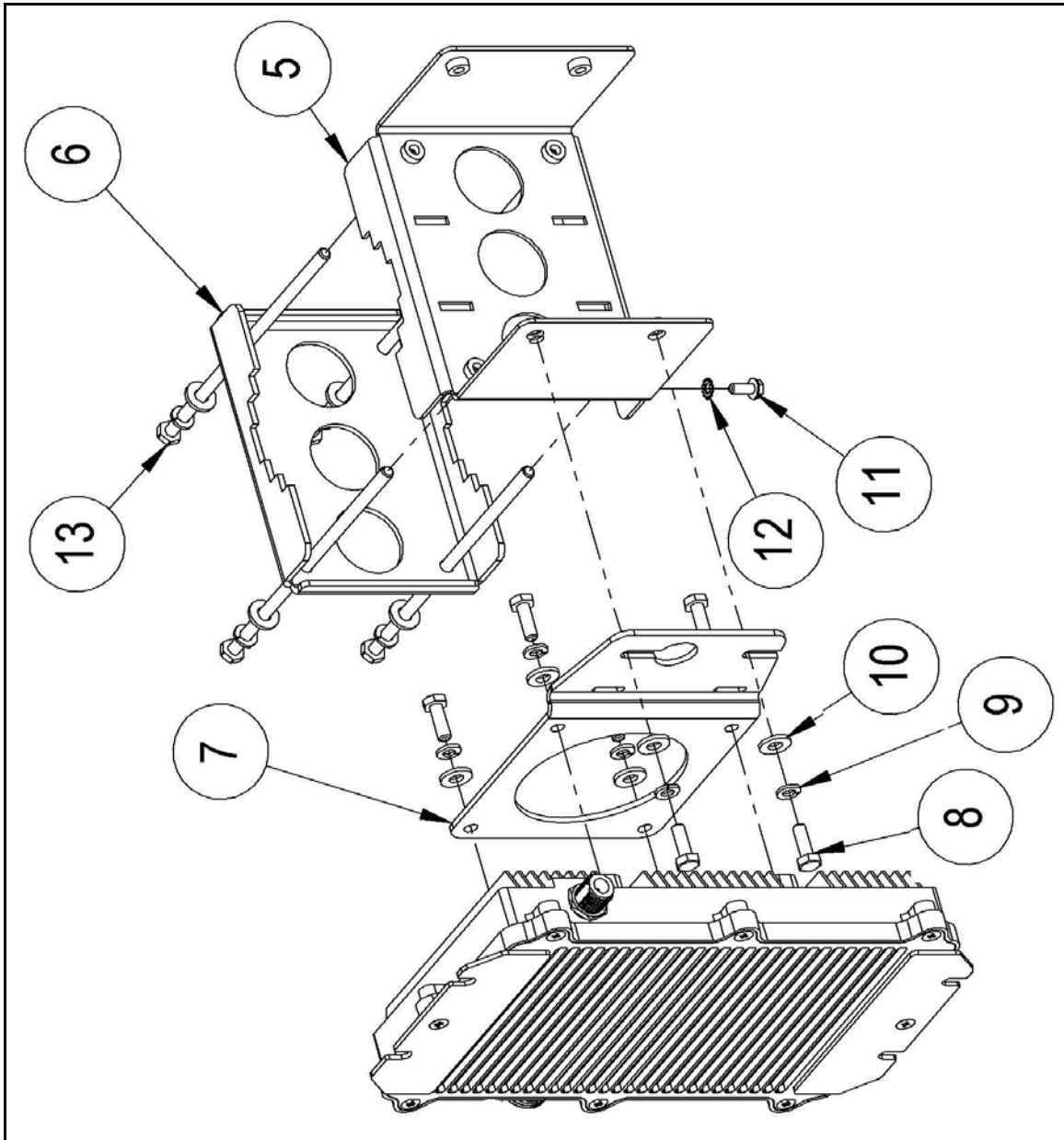


Figure 16: Parabolic Mounting Bracket - Assembly Drawing

3.2 Step 2: RF Connections

An RF jumper cable is provided to connect AN-80i unit to the antenna. Both ends of the RF cable must be weatherproofed. This section describes how to connect the RF cable and recommendations to assist weatherproofing the connections.

Important Notice: Outdoor Cable Assembly

Redline does not endorse or support the use of outdoor cable assemblies: i) not supplied by Redline, ii) third-party products that do not meet Redline's cable and connector assembly specifications, or iii) cables not installed and weatherproofed as specified in this manual. Redline warranty and service obligations will be voided under the conditions listed above. Refer to the Redline Limited Standard Warranty and RedCare service agreements for details.

3.2.1 RF Cable Connections

Apply a small amount of weatherproofing grease to weatherproof the nut threads on the RF cable (2). Connect the RF cable (2) between the AN-80i RF port (1) and the antenna RF port (3). The connectors must be tightened according to the following specifications.

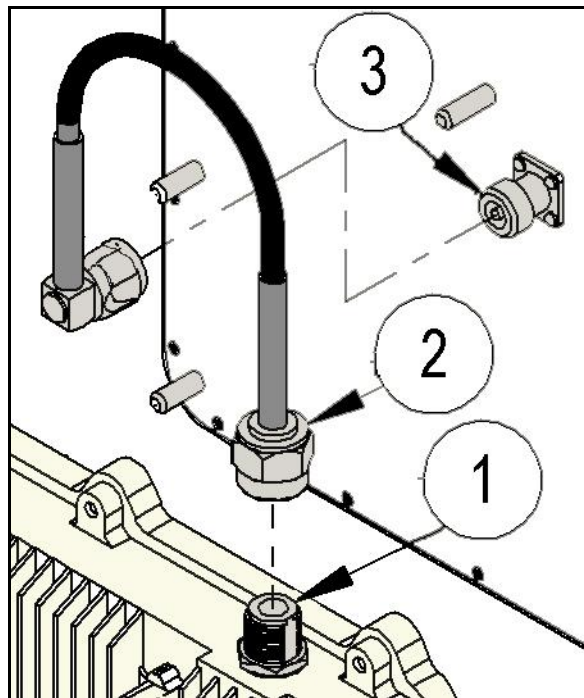


Figure 17: Weatherproof Ethernet Port - Assembly Drawing

RF connectors must be finger-tight plus 1/8th turn only (N-type: 12 lb-in / 135 N-cm). Use the proper tool for final tightening. Using excessive force (over-torque) or the incorrect tools will damage the female connectors on the antenna and AN-80i, and may defeat the connector weatherproofing features. The N-type connectors on the AN-80i must be weatherproofed. The following section provides a pictorial primer on correct weatherproofing procedures.

Table 11: RF Connector Torque Specifications

Connection	Torque Specification (Max.)	Connector Type
RF Jumper Cable	12 lb-in (1.35 N-m)	N-type Plug
RF Port Connector Jam Nut	20 lb-in (2.25 N-m)	N-type Socket

3.2.2 Weatherproof the RF Connectors

THE IMPORTANCE OF PROPER WEATHERPROOFING CAN NOT BE OVERSTRESSED.

Redline recommends sealing tapes designed for outdoor use:

- Scotch 2200 series of Vinyl Mastic rolls
- Scotch 130C Linerless Rubber Splicing Tape
- 3M Scotch Super 88 Electrical Tape

These are heavy-duty weather, abrasion, and UV resistant tapes that can be purchased at most hardware stores. Rubber mastic putty or duct sealing putty must also be used to complete the weatherproofing. The professional installer may use his own weatherproofing materials provided they are not silicon-based Redline does not recommend silicon seal or glue as these materials are difficult to apply accurately (can leave gaps) and are difficult to remove. Do not use PVC tape.

Both ends of the RF cable must be weatherproofed.

1. Begin to wrap the splicing tape. Start as close to the AN-80 body as possible. Stretch and wind the tape back along the connector housing making very sure there are no gaps in the tape.

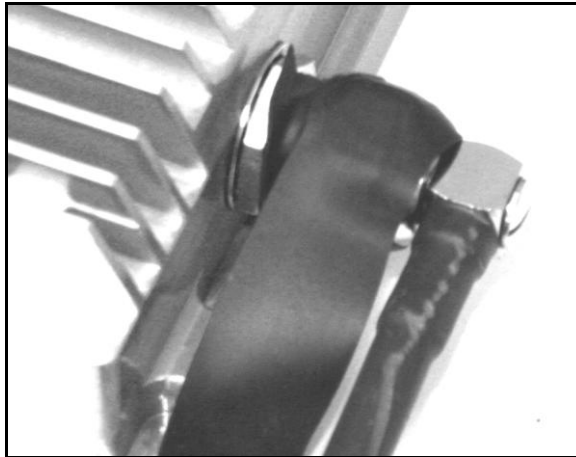


Figure 18: Weatherproofing - RF Cable Pt-1

2. Continue to wrap the tape tightly along the cable.



Figure 19: Weatherproofing - RF Cable Pt-2

3. Work the mastic putty well into the area between the connector and the body of the radio. Continue working the putty to make a watertight seal.

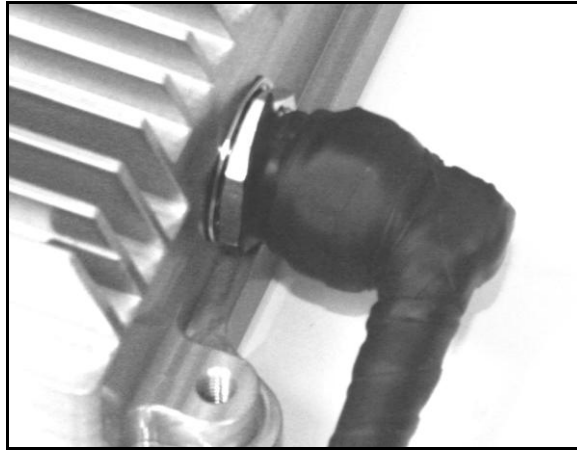


Figure 20: Weatherproofing - RF Cable Pt-3

4. The connection is now weatherproofed.



Figure 21: Weatherproofing - RF Cable Pt-4

Repeat this procedure for the antenna RF connector.

3.3 Step 3: Ethernet Connections

This section describes installation and weatherproofing of the outdoor Ethernet cable.



Important -- AN-80i Ethernet Cables

Caution: Do not insert any RJ-45 connector with a plastic hood into the AN-80i Ethernet port. The hooded connector will be extremely difficult to remove and may damage the AN-80i equipment. The maximum total length of the Ethernet cable is 100 m (328 ft). For example, 98 m from the AN-80i to the PoE and 2 m from the PoE to the network equipment.

Redline does not endorse or support the use of outdoor cable assemblies: i) not supplied by Redline, ii) third-party products that do not meet Redline's cable and connector assembly specifications, or iii) cables not installed and weatherproofed as specified in this manual. Refer to the Redline Limited Standard Warranty and RedCare service agreements.

3.3.1 Ethernet Cable and Connections

The Redline outdoor Ethernet cable is terminated with a non-hooded RJ-45 connector. This connects to the mating RJ-45 connector located inside the AN-80i enclosure. When connecting the outdoor Ethernet cable to the AN-80i, ensure the RJ-45 plug is fully inserted and locked into the socket.



Important: Ethernet Plug Must 'Click' into Socket

When inserting the RJ-45 plug into the mating socket, you should hear an audible 'click' from the plastic locking mechanism. Ensure the connector is locked before sealing and weatherproofing the AN-80i. Do not use cables where this locking mechanism is broken or has been removed!

The Ethernet port is protected from the weather by a weather-tight connector. The weatherproof connector must be finger-tight plus 1/8th turn only, and weatherproofed using tape and putty. Use the correct tool for final tightening. The indoor end of the Redline supplied Ethernet cable is terminated with a non-hooded RJ-45 connector. This connects to the OUTPUT (DATA & POWER) port of the indoor PoE power adapter. The minimum diameter conduit or hole required is 18 mm (11/16 in).

3.3.2 Assemble Weathertight Connector

When assembled correctly, the Ethernet port seal will be water-resistant.

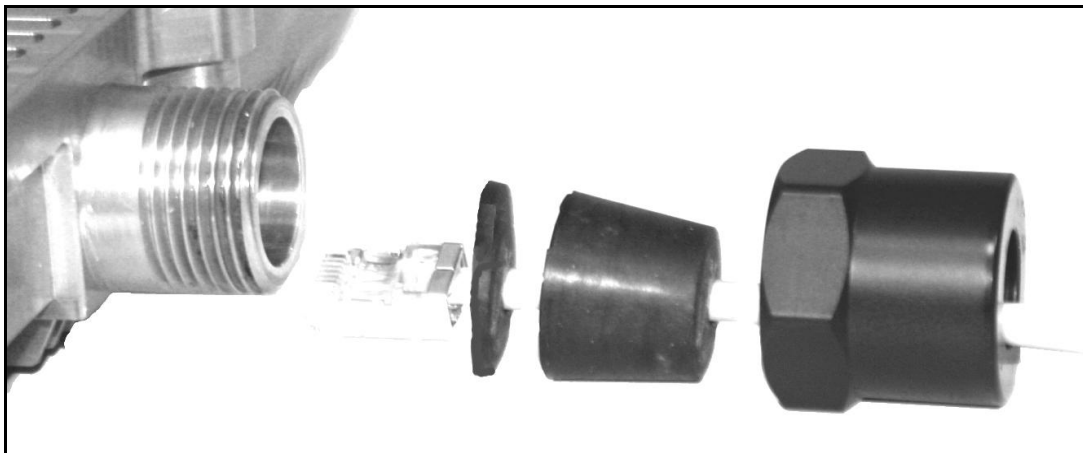


Figure 22: Ethernet Port Weatherproof Connector

Use the following steps to connect the Ethernet cable to the AN-80i unit.

1. Locate the AN-80i Ethernet port and remove the large nut (4), the split rubberized gasket (3) and the split washer (2).
2. Thread the Ethernet cable through the large nut (4) and connect the RJ-45 connector on the outdoor Ethernet cable (1) to the mating connector on the AN-80i. The RJ-45 connector is located inside the Ethernet port opening.
3. Fit the split washer (2) over the Ethernet cable (1) and slide tightly against the AN-80i chassis.



Important: Weatherproofing the Ethernet Port

The split washer must be installed on all AN-80i units having serial numbers beginning with 20-2008-00NN-NNNNN. Beginning with AN-80i series 20-2308-00NN-NNNNN, the split washer is not required (may not be included in kit).

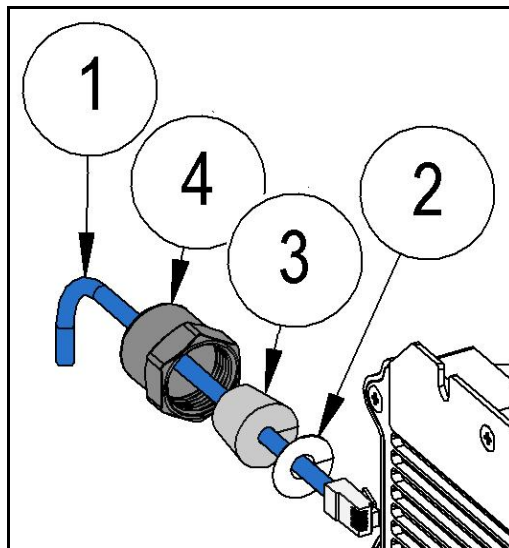


Figure 23: Weatherproof Ethernet Port - Assembly Drawing

4. Fit the split rubberized gasket (3) over the Ethernet cable (1) and slide tightly against the split washer (2). Note that the larger end of the gasket must be towards the end of the Ethernet cable.
5. Apply a small amount of grease to weatherproof the nut threads. Replace the nut (4) on the threaded portion of the AN-80i chassis. The connector must be finger-tight plus 1/8th turn only -- excessive force may damage the connector.

3.3.3 Disconnecting the Ethernet Cable

The RJ-45 connector is recessed within the AN-80i chassis. To disconnect the Ethernet cable from the AN-80i, you must release the locking tab located in the chassis recess. Carefully lift the tab to release the RJ-45 connector for removal from the AN-80i.



Figure 24: Weatherproof Ethernet Port - Ethernet Cable Locking Tab

A plastic removal tool is available from Redline to safely and easily disconnect the Ethernet cable from the AN-80i. Simply align the tool on the Ethernet cable and apply light pressure to release the locking tab. When the tab has been properly released, the cable should be able to be removed using only a very light pull (two fingers).

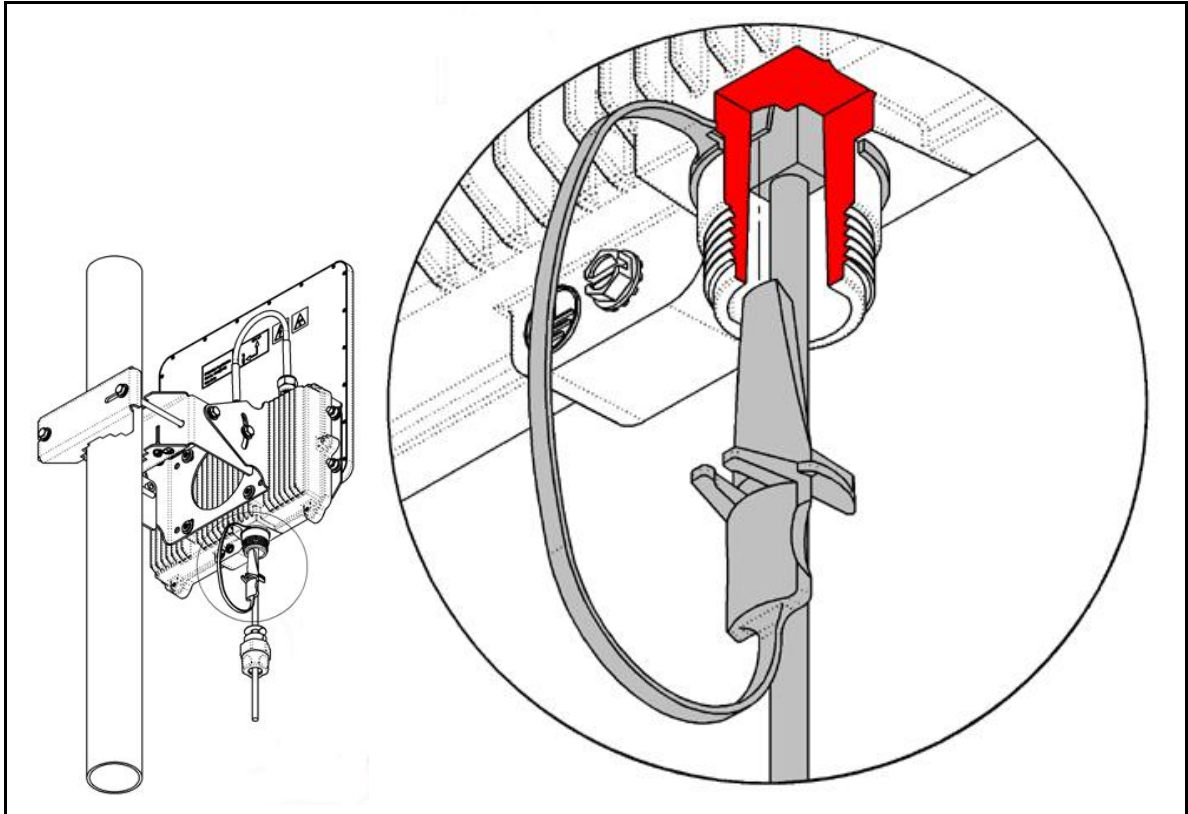


Figure 25: Weatherproof Ethernet Port - Disconnecting the Ethernet Cable

CAUTION: Ethernet Cable Removal

Use of excessive force when removing the Ethernet cable will damage the RJ-45 connector and the AN-80i printed circuit board.

1. Do not insert any tool more than 1/2 inch into the port opening.
2. Apply only very light upward pressure on the tool to unclip the plastic tab holding the RJ-45 connector.
3. Use only a light pull (two fingers) to remove the Ethernet cable.

3.3.4 Weatherproof Ethernet Port

While the Ethernet connection is weatherproof, it is always advisable to provide additional weatherproofing as follows:

1. Work mastic putty well into the end of the nut covering the Ethernet port. This provides strain-relief and an even surface when applying the weatherproofing tape.

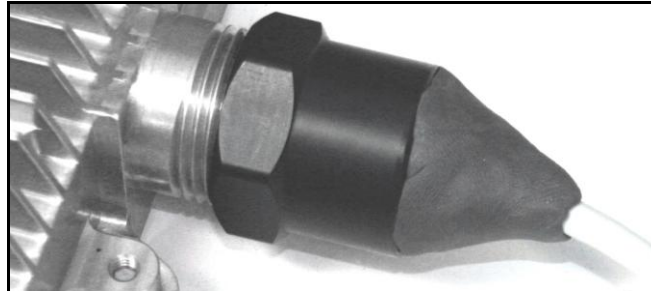


Figure 26: Weatherproofing - Ethernet Cable Pt-1

2. Wrap the splicing tape over the connector and cable. Start as close as possible to the AN-80i body. Stretch and wind the tape back along the Ethernet port nut, ensuring there are no gaps in the tape.

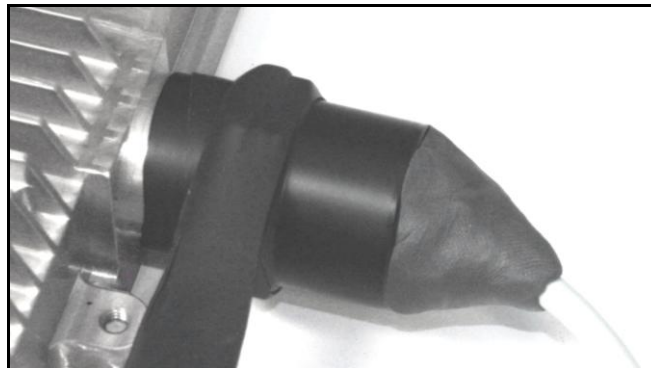


Figure 27: Weatherproofing - Ethernet Cable Pt-2

3. Continue to wrap the tape tightly along the cable complete the seal.

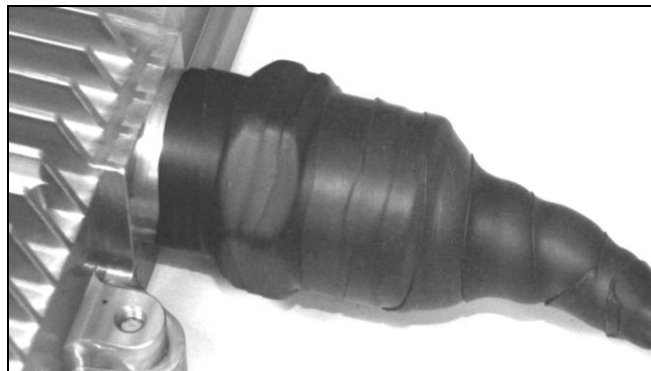


Figure 28: Weatherproofing - Ethernet Cable Pt-3

3.3.5 Protecting Ethernet Cables

Temperature and abrasion may damage the outdoor cables and lead to a degradation in service. It is recommended to review the following information about protecting outdoor cables. In extremely hot climates, the outdoor cable may be degraded when the temperature of the metal tower structure exceeds the maximum specified cable rating. In windy climates, excessive abrasion may damage the cables.

Redline recommends the use of suitable diameter spiral bound sleeving (generically called 'spiroband') to protect the outdoor cable. This sleeving should be available from most local electrical suppliers.

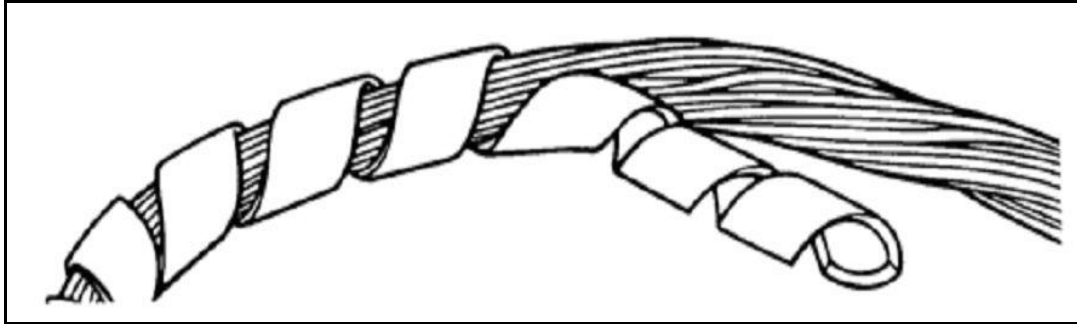


Figure 29: Outdoor Cable Protection - Spiroband

Wrap the sleeve around the outdoor cable for at least 300 mm (~12 in) in each direction from bonding points and any other area the cable is in direct contact with the metal tower. Cable ties can be used in the normal way to secure the cable.

3.4 Step 4: Installing the AN-80i

3.4.1 Surge Protection Guidelines

All outdoor wireless equipment is susceptible to lightning damage. Surge protection and grounding practices per the local and national electrical codes serve to minimize possible equipment damage, service outages, and serious injury. Common reasons for these damages can be summarized as follows:

- Tower/Antenna sites that are not grounded properly may conduct high lightning strike energy.
- Lack of installed surge protection equipment may cause equipment failures resulting from lightning induced currents.

The grounding system should provide a low-impedance path to ground for the lightning-induced current. A loose ground connection is a source of noise and may cause sensitive equipment to malfunction.

The tower grounding system disperses most of the surge energy from a tower strike away from the building and equipment. The remaining energy on the Ethernet cable shield and center conductor can be directed safely to ground by using a surge arrester in series with the Ethernet cable.

3.4.2 Grounding Guidelines



CAUTION

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

The following general industry practices are provided as a guideline only.

- All grounding connections must be made in accordance with local/national standards.
- Painted or dirty surfaces should be cleaned thoroughly down to bare metal and screws should be well tightened.
- Avoid sharp bends in the ground wire.
- The installation site should have had an external ground ring or bus bar.
- Above ground wire must be #2-6 AWG when interconnecting ground rings and #6 AWG (minimum) for grounding equipment and any metal objects
- Below ground wire must be #2 AWG (minimum).
- Ground rods must be 8 feet long (minimum) and 5/8-inch in diameter. Rods must extend 3 feet below any adjacent basement/vault.
- A grounding block should be installed where cables enter the building.

This section describes mounting of the AN-80i, recommendations for grounding and line protection equipment, and rough alignment of the antenna.

3.4.3 Installing the AN-80i Equipment

CAUTION: AN-80i Installation Guidelines

The following are general guidelines for system installation. The AN-80i must be installed by a qualified professional installer and follow local and national building codes and codes for electrical grounding and safety.

Failure to meet safety requirements and/or use of non-standard practices and procedures could result in personal injury and damage to equipment. A direct lightning hit may cause serious damage or injury even if these guidelines are followed for the system. Do not install outdoor components during adverse weather conditions when the threat of a lightning strike is possible.

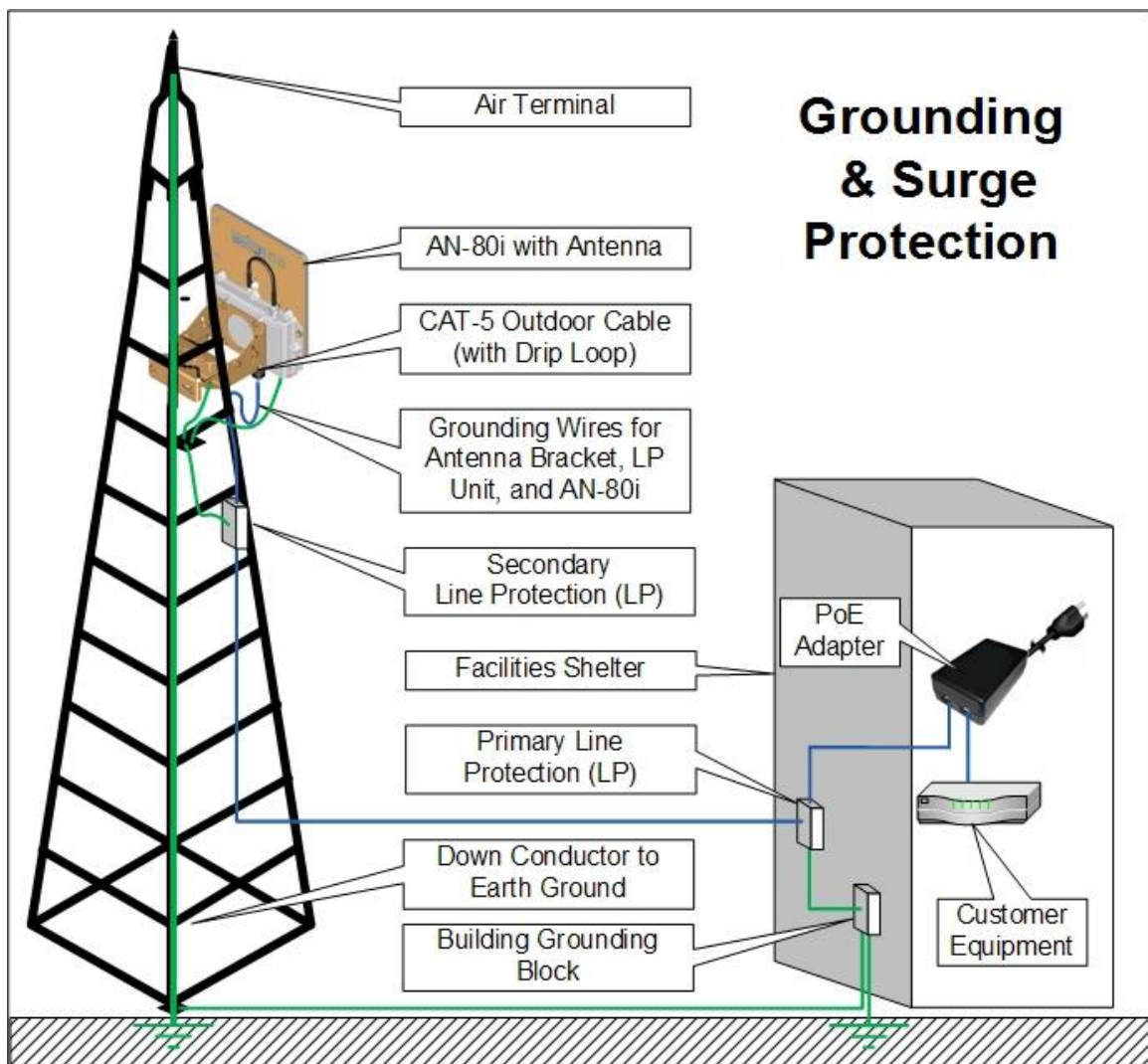


Figure 30: Mounting - Grounding & Surge Protection

The following recommendations are general industry practices:

- The antenna mast/tower must be connected to the master earth ground.
- It is recommended to pre-assemble and test the AN-80i equipment (AN-80i, mounting bracket, and antenna) and connection wiring before final installation of the units. Mount the pre-assembled AN-80i on the antenna mast.
- Direct grounding from the AN-80i, the mounting bracket, the antenna, and the Ethernet cable surge protection to the same ground bus on the building should be provided. Terminate ground wires using the grounding screws provided on the AN-80i and the antenna mounting bracket.
- A surge arrestor should be installed in series with the Ethernet cable as close to the AN-80i unit as practical. The grounding wire should be connected to the same termination point used for the tower or mast.
- A surge arrestor should be installed in series with the Ethernet cable at the point of entry to the building. The grounding wire should be connected to the same termination point used for the tower or mast.
- . If AC PoE is used, the AC wall outlet ground for the indoor POE adapter should be connected to the building grounding system.

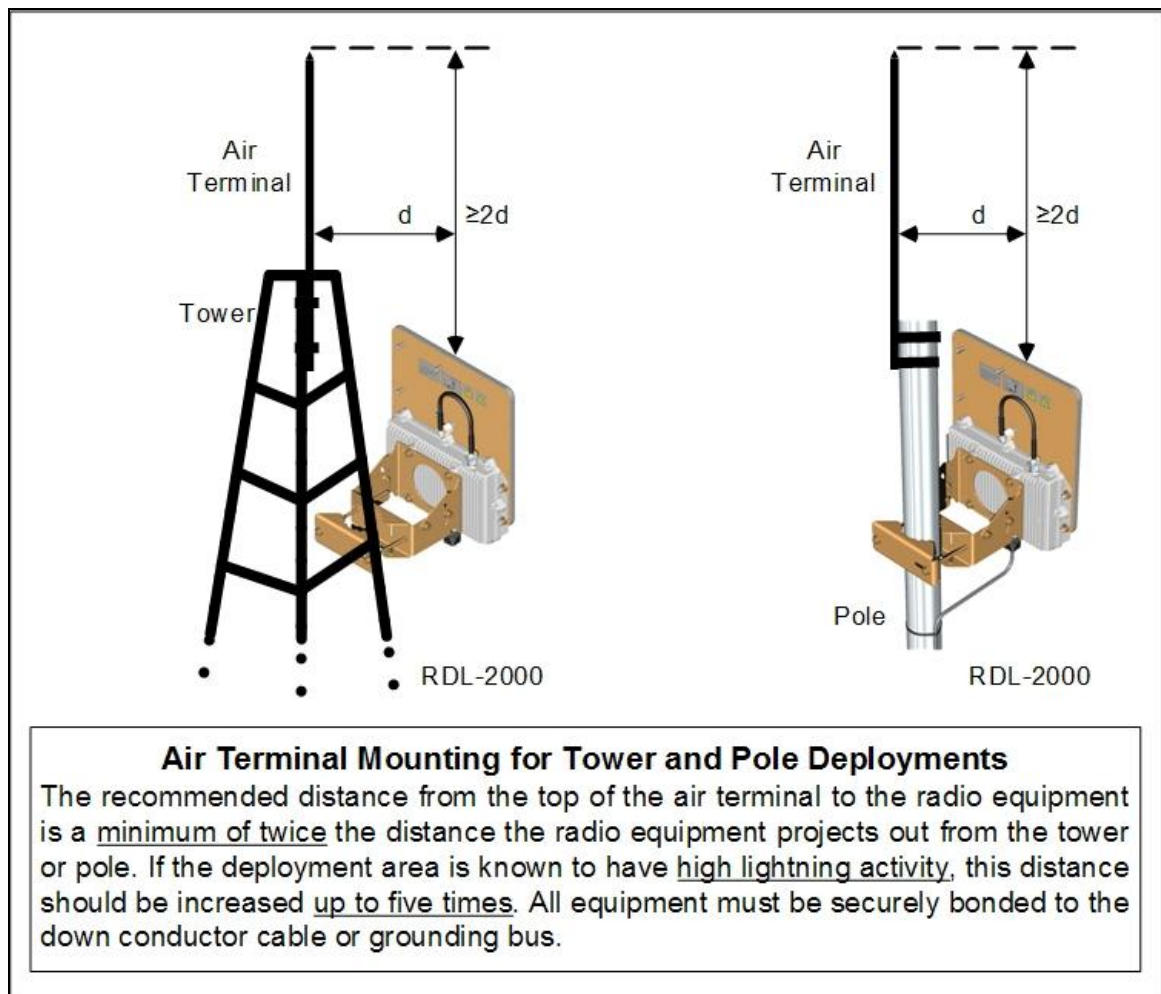


Figure 31: Mounting - Air Terminal for Tower and Pole Deployments

3.4.4 Line Protector Unit Wiring

This section describes the steps required to install the Ethernet line protector. The primary unit should be mounted as close as possible to where the Ethernet cable enters the building/shelter, on a plate or bulkhead panel that is bonded to an earth-ground system. It is recommended to pre-wire the LP device and test all connections before final outdoor installation.

⚠ CAUTION Do not install during adverse weather conditions when the threat of a lightning strike is possible.

Connect the LP unit according to the direction it is labeled:

SURGE: Connection to outdoor RDL-3000

PROTECTED: Connection to indoor PoE.

Do not switch Ethernet wires coming in and going out. For –IG (isolated ground) units, the connections are marked 2 X FEED and 2 X RTN (RETURN). The LP unit may be mounted/grounded on a nearby plate or bulkhead panel that is bonded to an earth-ground system.

1. Ground the chassis of the line protector with the provided 2 X 8-32 screws.

2. Terminal Block:

Wire gauge: 22-26 AWG

Wire strip length: 0.25"

Impact Tool (110 Connect): AMP 569994-1, AT&T D-814, or Krone universal wire insertion tool.

Screw-type terminal block: Use tightening torque 0.25 N-m (2.21 lb-in).

3. Lid:

Gasket: Ensure neoprene gasket is not loose and is properly fitted in groove.









Fasteners: 4 X M4 X 20 mm screws

Tightening torque 1.24 N-m (11 lb-in).

4. Outdoor Units:

Ensure all conduit fittings are correctly torqued and have O-rings to ensure environmental seal.

Table 12: Ethernet Line Protector - Wiring Diagram

Terminal.	Signal	Color Code	Pair	Identification
1	Rx +		2	White / Orange
2	Rx -		2	Orange
3	Tx +		3	White / Green
4	Tx -		3	Green
5	48 (+)		1	Blue
6	48 (+)		1	White/Blue
7	48 (-)		4	White/Brown
8	48 (-)		4	Brown

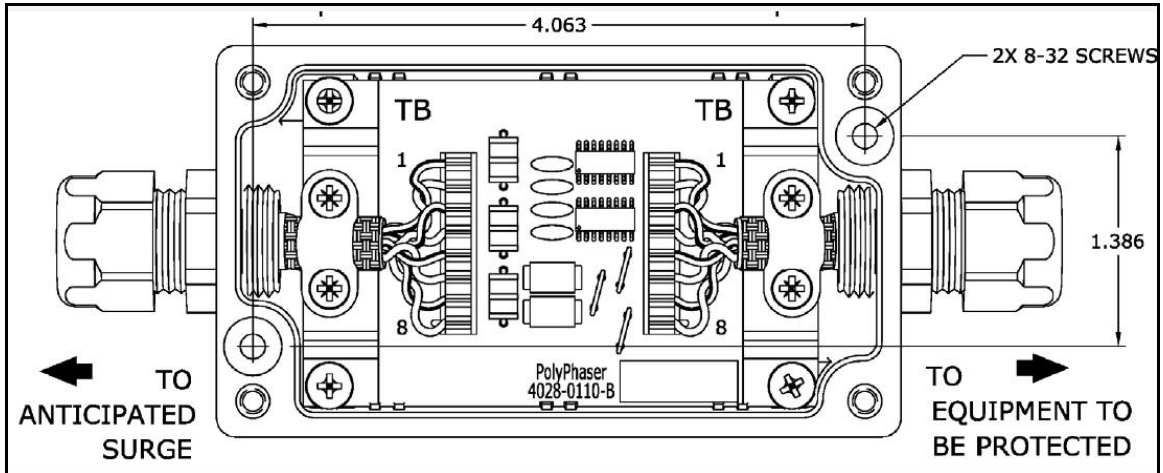


Figure 32: Ethernet Line Protector - Identifying Terminal Connectors

Note: Terminal block assignment is identical for both screw-type and 110Connect.

CAUTION For correct operation, it is very important that the line protector is properly connected to a low impedance (low R and low L) ground system.

3.4.5 Line Protector Mast Mounting Kit

The LP mast mount kit can be used to mount the surge protector device to a 51 to 177 mm (2 to 7 in) mast.

Note: The Polyphaser IX-PLMNT Pole-Kit kit is not available directly from Redline, and must be ordered separately (if required) from a telecom equipment distributor.

1. Align assembly bracket (4) mounting holes with mounting holes at the bottom of the mounting box.
2. Insert screws (3) through the mounting box, and assembly bracket (4) and secure with #8 flange nut (2).
3. Slide hose clamp (1) through both slotted grooves of bracket (4), secure hose clamp to mast.

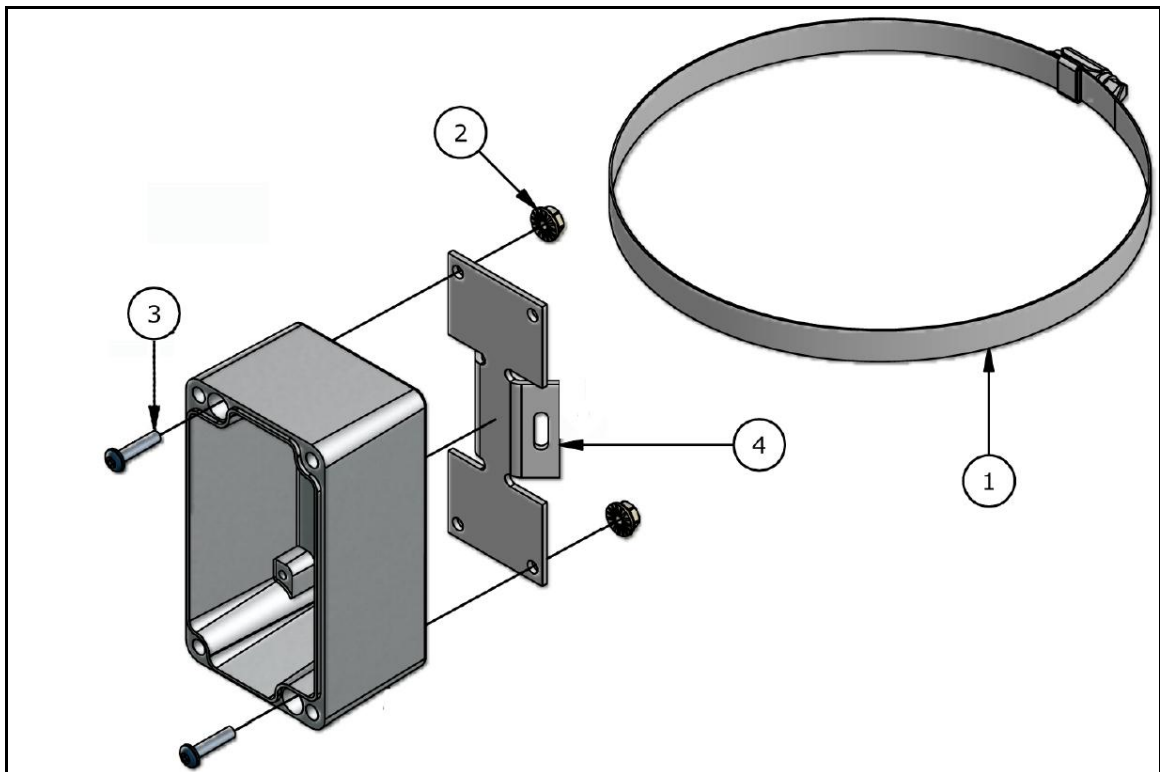


Figure 33: Ethernet Surge Protection - Mast Mounting Kit

Table 13: Ethernet Line Protector - Mounting Kit Parts List

Item	Qty	Description
1	1	Metal Hose Clamp: 51 to 177 mm (2 to 7 in)
2	2	8-32 Hex HD Flange Nut 18-8 SS
3	2	8-32 Screw 3/4" Phillips Pan SS
4	1	Mounting Bracket Al

3.4.6 Weatherproof LP Connections

It is important to weatherproof both ends of the line protection unit.

1. Begin to wrap the splicing tape. Start as close to the LP housing as possible. Stretch and wind the tape back along the connector housing making very sure there are no gaps in the tape.

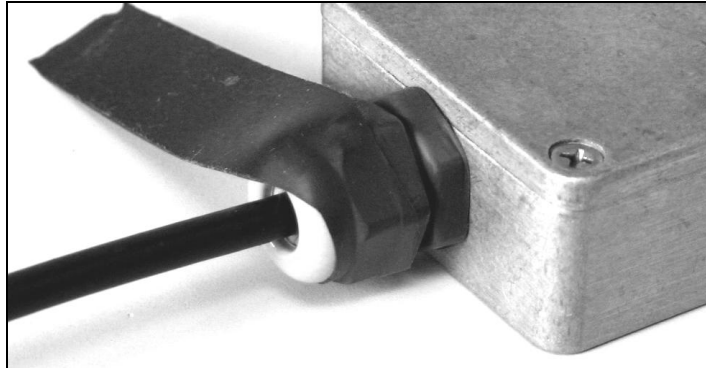


Figure 34: Weatherproofing - LP Ethernet Cable Entry - Pt-1

2. Continue to wrap the tape tightly along the cable.



Figure 35: Weatherproofing LP Ethernet Cable Entry - Pt-2

3. Work the mastic putty into the area between the connector and the body of the LP. Continue to work the putty in making a watertight seal. The connection is now well weatherproofed.

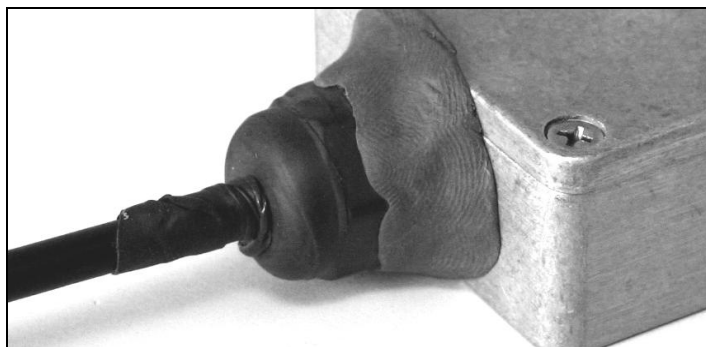


Figure 36: Weatherproofing LP Ethernet Cable Entry - Pt-3

Repeat this procedure for both cable connections to the LP.

3.4.7 Ethernet Cable Drip Loop

It is strongly recommended to install the outdoor Ethernet cable with a drip loop. This procedure reduces mechanical strain on the AN-80i Ethernet port. A drip loop should also be employed when mounting surge protection devices to avoid mechanical stress and excess water flow at the Ethernet wiring portals.

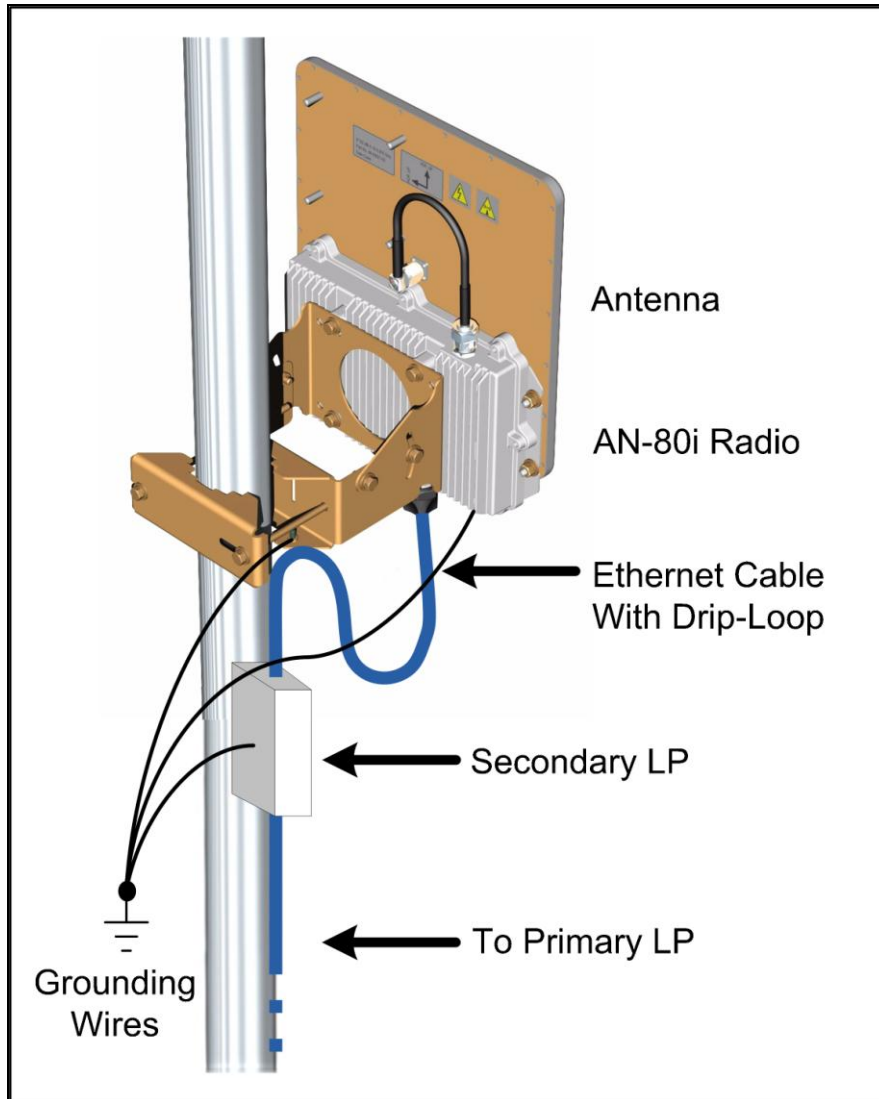


Figure 37: Mounting - Cable Drip Loop

3.4.8 Basic Antenna Alignment

Correct antenna alignment is essential in obtaining the maximum performance from the wireless link. A misaligned antenna will result in decreased receive signal strength and you may be unable to establish the wireless link.

The alignment must be performed in both the azimuth and elevation planes. Before installing the equipment, obtain accurate antenna pointing azimuth and elevation angles for each installation site (see section 2: Site Survey Information on page 14). This will allow approximate alignment of antennas by using GPS or magnetic compass.

Azimuth Alignment

Use a magnetic or GPS compass to obtain the approximate azimuth direction. The azimuth is aligned by loosening the bolts on the pipe bracket and rotating the antenna around the pole.

Elevation Alignment

Most links will have an elevation of 0°. The antenna can be set vertically (to a close approximation) using a bubble (spirit) level as shown in Figure 38 below. This method is not accurate for elevation settings of greater than 5 degrees.

To adjust the elevation, loosen the appropriate bolts of the mounting bracket. For the lightweight bracket, use the four bolts labeled #12 in the assembly instructions (Figure 9: Lightweight Mounting Bracket - Assembly Drawing on page 23). For the heavy-duty antenna bracket, use the four bolts labeled #9 for vertical adjustment (see Figure 12: Heavy Duty Mounting Bracket - Assembly Drawing on page 26).



Figure 38: Antenna Alignment - Levelling Antenna Elevation Plane

Fine Alignment

The AN-80i must be connected to the Ethernet PoE adapter and configured before the antenna alignment can be completed.



Important: Antenna Polarization

The same antenna polarization must be used for both AN-80i units in a PTP link and all units in a PMP deployment. The arrows on the rear of the antenna indicate the polarization.

3.5 Step 5: Install Indoor PoE Power Block

The PoE adapter provides operational power and the Ethernet connection to the wireless interface. The power block provides two Ethernet interfaces:


INPUT (DATA): The 10/100Base-T Ethernet port (RJ-45) for connection to local network equipment.

OUTPUT (DATA & POWER): The 10/100Base-T Ethernet port (RJ-45) port to carry signal and power to the AN-80i outdoor unit.

The PoE adapter must be installed indoors, located close to a reliable AC or DC power (based on the type of PoE purchased for this deployment).

AC Power: The AC model indoor Power-over-Ethernet (PoE) power block is auto-sensing 110-240 VAC. A grounded AC outlet must be provided within about one meter of the PoE adapter mounting location. The AC power cable is supplied with a grounding power plug. Do not defeat this important safety feature.

DC Power: The DC model indoor Power-over-Ethernet (PoE) power block is auto-sensing 18 - 80 VDC. Customer must supply wiring of adequate gauge.



Warning to Service Personnel: 48 VDC

Customer equipment including personal computers, routers, etc., must be connected only to the INPUT (DATA) port on the PoE unit. Only the outdoors Ethernet interface cable connecting to the AN-80i can be safely connected to the OUTPUT (DATA & POWER) connector. Connecting customer premises Ethernet equipment directly to the OUTPUT (DATA & POWER) connector on the Power-over-Ethernet power adapter may damage customer equipment.

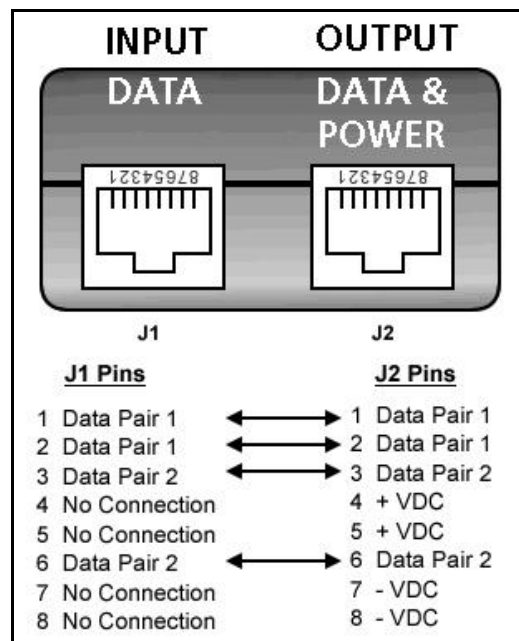


Figure 39: Intro - Indoor Power-over-Ethernet (PoE) Module - AC Model

3.6 Step 6: Configure AN-80i

This section can be used as a guideline for initial commissioning of an AN-80i PTP links. For PMP links, also refer to the AN-80i PMP Quick Configuration Guide (70-00085-01). Refer to the User Manual for complete operating, troubleshooting and antenna specifications.

3.6.1 Pre-Configure Test PC

The following procedures require a PC equipped with a Web browser (Internet Explorer 6.0 or higher), an Ethernet port, and an Ethernet Cat-5e crossover cable for connection to the PoE power adapter.

The IP address and the subnet mask of the PC must be on the same subnet as the AN-80i. Recommended settings for the PC are:

IP address = 192.168.25.11
Net Mask = 255.255.255.0

3.6.2 AN-80i Connections and Power-Up

The AN-80i receives power from the indoor PoE power adapter through the outdoor Ethernet cable.

1. Route the Ethernet cable from the AN-80i to the indoor location selected for the PoE power adapter.
2. Connect the Ethernet outdoor cable from the AN-80i to the OUTPUT (DATA & POWER) port on the PoE power adapter.
3. Connect your PC to the INPUT (DATA) port of the PoE power adapter.
4. Connect the PoE power adapter to a suitable AC power source.

3.6.3 AN-80i Startup and Configuration

You can communicate with the AN-80i through Telnet or a standard HTML web browser. To use the web browser, start the browser and type the default IP address (192.168.25.2) into the address bar.

1. On the PC, open a browser (Internet Explorer 6 or higher recommended) and enter the default IP address (192.168.25.2).



Figure 40: Web - Login Screen

2. Login to the AN-80i using the default parameters:

User Name = admin
 Password = admin

If the IP address, username and/or password have been modified since installation, contact the network administrator to determine the current settings. If the IP address, or the username and password cannot be determined, refer to the Diagnostics & Troubleshooting section in the User Manual.

3. You may not be able to establish a link between AN-80i units, or configure all required parameter settings until you have entered the permanent options key. Permanent options keys must be purchased and are provided in electronic format. The options key (a string of numbers, letters, and dashes) enables AN-80i features including the maximum uncoded burst rate and frequency ranges (region codes). Every options key is unique to an AN-80i unit.

Important: Options Keys
If an AN-80i is placed in-service without entering a purchased permanent Options Key -- the wireless link will experience a service outage.

Each new AN-80i received from the factory will contain a temporary options key. This temporary key may provide temporary access to advanced options and settings. When the factory options key expires, only limited service will be available (restricted RF frequency, data rates, etc).



Figure 41: Configuration - Options Key

4. It is recommended to make the following settings on the AN-80i:

Table 14: Configuration - Default System PTP Settings		
Setting	Master AN-80i	Slave AN-80i
System Mode	PTP Master	PTP Slave
RF Frequency	Set RF frequency according to network design.	Must match RF setting on PTP Master
Link Distance	Automatic	Automatic
Adaptive Modulation	Enabled <input checked="" type="checkbox"/>	Enabled <input checked="" type="checkbox"/>
ATPC	Disabled <input type="checkbox"/>	Disabled <input type="checkbox"/>
IP Address	192.168.25.2	192.168.25.3

Notes: For each PTP link:

- a) One AN-80i must be set to PTP Master and the other to PTP Slave.
- b) Each AN-80i must have a unique IP address.
- c) Each AN-80i pair must have the identical Link Name (may both be blank).

- Use the AN-80i Spectrum Sweep feature to determine if the selected RF channel is free from interference. Click on [Spectrum Sweep](#) in the main menu and enter the start and stop frequency range, the step size, and the number of acquisitions (samples) for each step. Note that sample sizes >10 require a significantly long period to complete.

The following example illustrates a spectrum sweep from 5735 - 5795 MHz, with a step size of 2.5 MHz. The range 5780 - 5787.5 MHz would be considered to be free from interference (-89 dB).

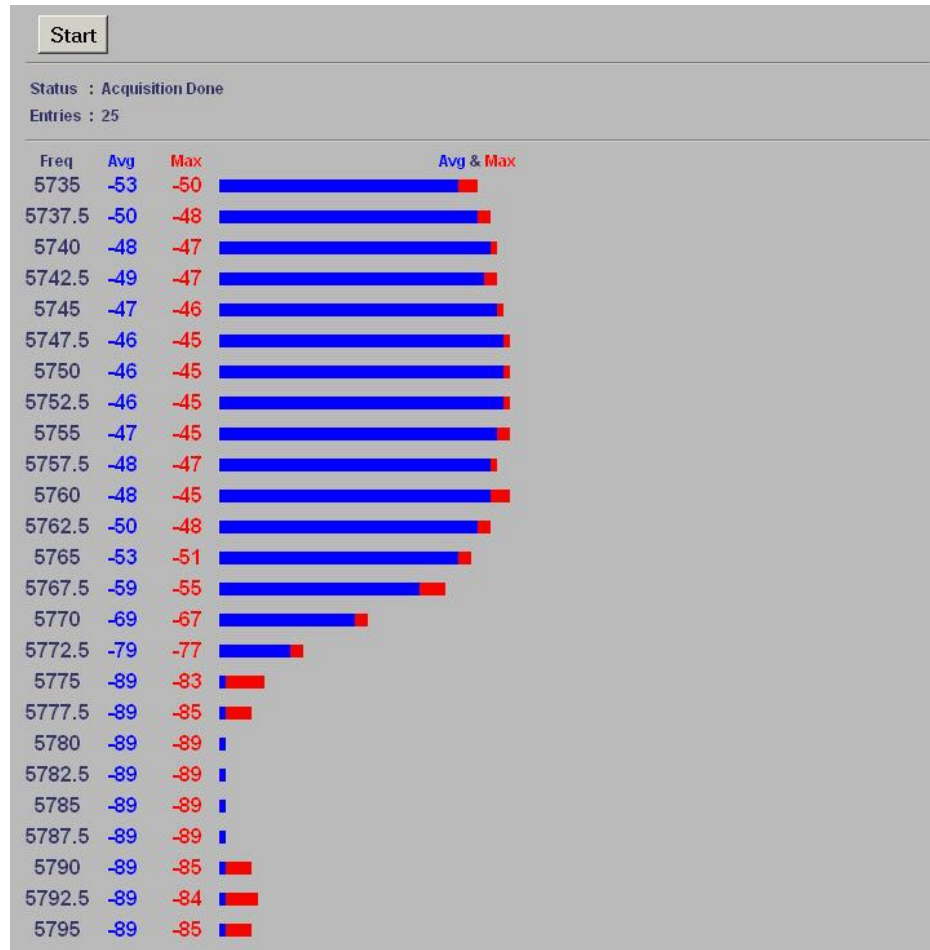


Figure 42: Configuration - Spectrum Sweep

A channel is considered available when free of interference for +/- one-half the channel bandwidth from the selected channel. For example, a 20 MHz channel is considered available when free of interference +/- 10 MHz from the channel selection.

- Repeat steps 3 - 5 as required for the other AN-80i units in this deployment.
- This step requires sending data traffic over the wireless link while monitoring the system statistics page for errors. If wireless errors are recorded and/or the received signal strength (RSSI) values are not as predicted in the link budget, the antennas may need to be re-aligned. This may also indicate an obstruction in the RF path.

Note: In systems where ATPC is disabled, higher Tx power settings may reduce the SINADR value. If the SINADR is less than expected, re-test the link using a lower Tx power setting.

System Status		Reset Statistics	
General Information		Wireless Statistics	
System Name	AN-80i	Link ID	65535
Software Version	4.00.038	Received Signal Strength - Min.	-89.90 dBm
Tx Status	On	Received Signal Strength - Mean	-89.90 dBm
RF Link Established	No	Received Signal Strength - Max.	-89.90 dBm
Data Link Established	No	SINADR	0.00 dB
Wireless Security	Off	Rx Packets	0
FIPS Mode	Off	Rx Packets - Retransmitted	0
Uncoded Burst Rate	6 Mb/s	Rx Packets - Discarded	0
System Mode	PTP Master	Tx Packets	0
RF Channel Frequency	5600.0 MHz	Tx Packets - Retransmitted	0
Tx Power	14 dBm	Tx Packets - Discarded	0
DFS enabled	No		
DFS action	None		
Link Distance	0 Miles		
Status Code	0		
Ethernet MAC Address	00:09:02:00:b2:73		
IP Address	192.168.25.2		
IP Subnet Mask	255.255.255.0		
Default Gateway Address	192.168.25.1		
Ethernet LAN Statistics			
Rx Packets	134		
Rx Packets - Discarded	0		
Tx Packets	142		
Antenna Alignment			

Figure 43: Configuration - RSSI Statistics

3.6.4 Antenna Adjustment Using Web Alignment Tool

The AN-80i provides a web-based alignment tool to assist in obtaining the highest RSSI value and the best SINADR ratio. This web page can be accessed from a laptop computer and most web-enabled handheld devices.

1. Start Internet Explorer (or equivalent) on your PC (or handheld device).
2. Type the following URL into the address bar (default IP address is shown).
`http://192.168.25.2/usr/aa.html`
3. Login to the AN-80i with the default user name 'admin' and password 'admin'.

The screen will be updated automatically at one second intervals. Refer to antenna alignment procedure later in this section.

3.6.5 Antenna Adjustment Using Audible Tone

Following the basic antenna alignment, smaller adjustments can be made using the audible alignment buzzer in the AN-80i. A faster repetition rate of the buzzer indicates a stronger signal being received from the remote-end transmitter. Adjust the AN-80i antenna by small changes first the elevation and then the azimuth adjustments to obtain a maximum reading.

The audible alignment buzzer is normally turned off and must be enabled using a web browser or Telnet session. Use the following steps to enable or disable the buzzer.

Enable Audible Tool Using Web Browser

1. Start Internet Explorer (or equivalent) on your PC and type the default IP address (192.168.25.2) in the address bar. Login to the AN-80i with the default user name 'admin' and password 'admin'.
2. Click on Configure System in the left hand menu.
3. Find the field 'Antenna Alignment Buzzer Enable' (bottom of screen) and enable this feature by clicking in the box. A checkmark (☑) will appear when the buzzer is enabled.
4. Click the Save button (bottom of screen) to activate and save changes.

The audible alignment signal will remain active until this field is disabled.

Enable Audible Tool Using CLI

1. Start a Telnet session on your PC and type the default IP address (192.168.25.2) in the address bar. Login to the AN-80i with the default user name 'admin' and password 'admin'.
2. Enable the audible alignment tool. The audible alignment signal remains active until this field is disabled.

```
set buzzer on
save config
```
3. To disable the audible alignment tool, start a Telnet session to the AN-80i and enter the following commands:

```
set buzzer off
save config
```

3.6.6 Antenna Adjustment Using RSSI

Antenna adjustments can also be made based on RSSI measurements reported by the AN-80i. The RSSI information is available on the Web interface of the AN-80i (System Status screen), through the CLI interface (stats command), or using the web alignment tool [http://\[AN-80i IP\]/usr/aa.html](http://[AN-80i IP]/usr/aa.html).

Note: For PMP deployment, the base station antenna requires only a general alignment. It is recommended that subscribers, especially those using high-gain antennas, should be fine-adjusted using the RSSI measurements.

Slowly adjust the antenna elevation, and then azimuth in a broad sweeping pattern, while observing the peaks and valleys in the RSSI readings.

While sweeping the antenna, the RSSI value will rise when aligned to a sidelobe, and then fall and rise to the highest reading when the receiver is properly aligned to the main beam. Further movement of the antenna will cause the RSSI to fall and then rise to a lower peak when aligned to another sidelobe.

When the alignment sweep has been completed, the measured RSSI value should be checked against the estimated value obtained from the link budget. If the wireless link is LOS, the measured RSSI value should be within 5 dBm of the calculated value.

A lower or fluctuating RSSI value may indicate that the antenna is aligned to a sidelobe. If the RSSI value is much lower than the link budget prediction, this may indicate an optical LOS or non-LOS path. If the link is non-LOS, a suitable reflecting surface such as a building or billboard must be used. For non-LOS deployments, it is necessary to install the link and perform vertical and horizontal sweeps of the antenna to determine if the required throughput can be achieved.

When the alignment is complete, tighten each bolt in a cross-pattern to minimize shifts in the antenna alignment. Tighten all bolts to the recommended torque.

Note: A metal tower will affect the accuracy of a magnetic compass. Magnetic declination (the difference between true North and Magnetic North) must also be taken onto account.

3.6.7 Installation Procedure for DFS-Enabled Systems



Important: DFS Settings

Where DFS is required by regional regulations, this function is permanently enabled at the factory and can not be disabled by the installer or end-user.

When installing the AN-80i system in regions that require DFS to be enabled, antenna alignment may be interrupted by false DFS triggering. DFS events can disable AN-80i transmissions for up to 30 minutes (Tx Off) or disable transmissions for one minute and change the RF frequency (Chg Freq). While the DFS feature cannot be disabled at any time during system operation, the following procedure is recommended to minimize the effects of the false triggering while aligning antennas for a single PTP link.

Summary

In step 1, the PTP Master provides an RF reference while antenna adjustments are made to the PTP Slave operating with the radio disabled. Operating the PTP Slave in listen-only mode while adjusting the antenna avoids false DFS triggering due to rapid changes in RF signal strength seen at the Master unit. In step 2, the Master/Slave configuration is reversed to allow alignment of the remote end system antenna.

Step A -- Align Site A Antenna

- a) Go to the location where the AN-80i is operating as a PTP Slave -- this is the Site A.
- b) Login to the remote PTP Master (Site B) and adjust the parameters to match the Site B settings in Table 15: Configuration - Settings for Antenna Alignment (DFS) - Step 1 and save changes.
- c) Login to the local PTP Slave and adjust the parameters to match the Site A settings in Table 15: Configuration - Settings for Antenna Alignment (DFS) - Step 1 and save these changes. The wireless link will be lost, but the AN-80i will monitor the RF signals.

Table 15: Configuration - Settings for Antenna Alignment (DFS) - Step 1

Setting	Site A	Site B
System Mode	PTP Slave	PTP Master
DFS Action	Chg Freq	Chg Freq
Auto Scan	<input checked="" type="checkbox"/> (Enabled)	N/A
Radio Enable	<input type="checkbox"/> (Disabled)	<input checked="" type="checkbox"/> (Enabled)
ATPC	<input type="checkbox"/> (Disabled)	<input type="checkbox"/> (Disabled)

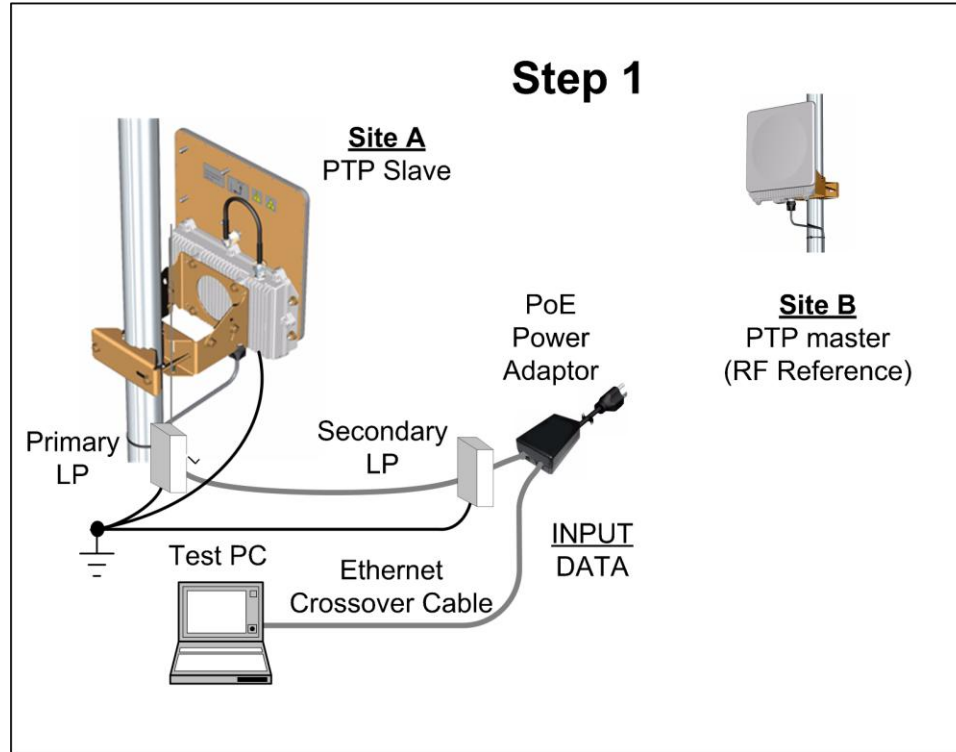


Figure 44: Configuration - Antenna Alignment (DFS) - Step 1

d) On the PTP Slave, slowly adjust the antenna elevation, and then azimuth in a broad sweeping pattern. As the antenna is adjusted, use the Web GUI (or CLI) to monitor the RSSI readings. The RSSI value will rise when aligned to a sidelobe, and then fall and rise to a higher reading when the antenna is aligned to the main beam. Further movement of the antenna will cause the RSSI value to fall and then rise to a lower peak as the antenna is aligned to another sidelobe.

e) When the antenna alignment is complete, tighten each bolt in a cross-pattern to minimize shifts to the antenna alignment. Tighten all bolts to the recommended torque.

Step B -- Align Site B Antenna

- a) Enable the PTP Slave radio (Site A), allowing the wireless link to be established.
- b) Login to the remote PTP Master (Site B), adjust the parameters to match the Site B settings in Table 16: Settings for Antenna Alignment (DFS) - Step 2 and save these changes. The remote system will reboot as a PTP Slave (wireless link will be lost).
- c) Login to the local PTP Slave (Site A), adjust the parameters to match the Site A settings in Table 16: Settings for Antenna Alignment (DFS) - Step 2 and save these changes. The local system will reboot as a PTP Master.

Table 16: Settings for Antenna Alignment (DFS) - Step 2		
Setting	Site A	Site B
System Mode	PTP Master	PTP Slave
DFS Action	Chg Freq	Chg Freq
Auto Scan	N/A	<input checked="" type="checkbox"/> (Enabled)
Radio Enable	<input checked="" type="checkbox"/> (Enabled)	<input type="checkbox"/> (Disabled)
ATPC	<input type="checkbox"/> (Disabled)	<input type="checkbox"/> (Disabled)

d) Go to the Site B location and repeat Step 1 parts c), d) and e) to align the antenna.

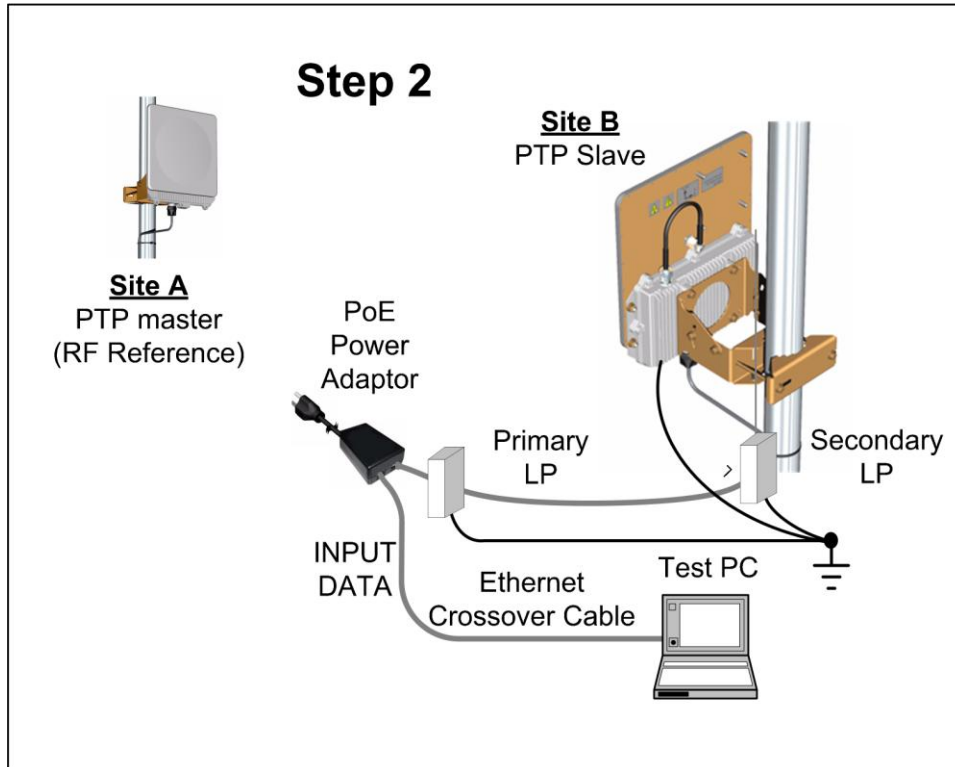


Figure 45: Configuration - Antenna Alignment (DFS) - Step 2

e) Enable the PTP Slave radio (Site B), allowing the wireless link to be established. This completes the alignment procedure.

3.6.8 Configure AN-80i Ethernet Network Settings

The last step in deployment is to correctly configure each AN-80i for operation with the local Ethernet network. This requires setting the network address and SNMP parameters to match the network design. Contact your network system administrator for details.

Also refer to the following documents:

AN-80i Quick Install Guide: general setup.

AN-80i PMP Quick Configuration Guide: PMP configuration settings.

AN-80i User Manual: Detailed information about all device settings.

