



Hypercable

HyperRake OFDM TDMA Series

FODU Wi50 Full Outdoor Unit

Technical Description & Configuration Guide

Product code: HYP2050HBS23 & HYP1050HBS46



HyperCable Rural Broadband Radio sans licence HyperR@ke - Design optimisé pour vidéo H264 -

	Antenne Séparée		Antenne intégrée		
Nom de la gamme	HyperR@ke 5 GHz	FHF FDD 5 GHz	HyperR@ke 5 GHz	HyperR@ke 5 GHz	FHF FDD 5 GHz
Modèle	HYP2050HBS23	HYP205823	HYP105041	HYP1050HBS46	HYP1058HBS46
Aspect					
Gamme de Fréquences	Customisées: 4920~6060 MHz	57255770 MHz (Low band) 5805-5850 MHz (High band) T/R Duplex 80 MHz z. Aussi en 2.3/2.5 GHz z	Customisées: 4920~6060 MHz z	Customisées: 4920~6060 MHz z	57255770 MHz (Low band) 5805-5850 MHz (High band) T/R Duplex 80 MHz z
Modulation	OFDM TDMA	Turbo OFDM	OFDM TDMA	OFDM TDMA	Turbo OFDM
Schéma Duplex	TDD	FDD	TDD	TDD	FDD
Network Architecture	PTP / PTMP	PTP seulement	PTP / PTMP (CPE)	PTP / PTMP (CPE)	PTP seulement
Canal BW	5/10/20/40 MHz z	5/10/20/40 MHz z	5/10/20/40 MHz z	5/10/20/40 MHz z	5/10/20/40 MHz z
Puissance ou EIRP	23dBm	23 dBm	EIRP=41dBm	EIRP=46dBm	EIRP=46dBm
Antenne	36dBi Parabolique (toutes options)	36dBi Parabolique (toutes options)	18dBi Planar Intégrée	23dBi Planar Intégrée	23dBi Planar Intégrée
Portée LOS	>60Km	>80Km	30Km	40Km	>60Km
Data Rate	108 Mbps	108+108 Mbps(216Mbps agrégés)	108 Mbps	108 Mbps	108+108 Mbps (216Mbps agrégés)
Débit utile TCP	50Mbps	50+50Mbps (100Mbps agrégés)	50Mbps	50Mbps	50+50Mbps (100Mbps agrégés)
Latence typique par voie	20~30ms	<1ms	20~30ms	20~30ms	<1ms
Protocole propriétaire	Oui	Oui	Oui	Oui	Oui
Hyper ARQ (ARQ+FEC)	—	Oui	—	—	Oui
DC 48V (36~60V)	Option	Option	Option	Option	Option
Mode de Propagation	Non LOS & Near LOS	LOS	Non LOS & Near LOS	Non LOS & Near LOS	LOS

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HyperRake Wi50 Wireless Outdoor Radio

Manual & Installation Guide

Version 2.1.0

APR. 2013

■ WARNINGS



In order to comply with international radio frequency (RF) exposure limits, dish antennas should be laced at a minimum of 8.7 inches (22 cm) from the bodies of all persons. Other antennas should be laced a minimum of 7.9 inches (20 cm) from the bodies of all persons.



Do not work on the system or connect or disconnect cables during periods of lightning activity.



This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.



Ultimate disposal of this product should be handled according to all national laws and regulations.



Do not locate the antenna near overhead power lines or other electric light or power circuits, or where it can come into contact with such circuits. When installing the antenna, take extreme care not to come into contact with such circuits, as they may cause serious injury or death. For proper installation and grounding of the antenna, please refer to national and local :



Only trained and qualified personnel should be allowed to install, replace, or service this equipment.



The outdoor radio and POE injector can be damaged by incorrect power application. Read and follow the installation instructions carefully before connecting the system to its power source.



Follow the guidelines in this installation guide to ensure correct operation and safe use of the radio.

■ PACKAGE CONTENTS

The package you have received should contain the following items:

- Outdoor Subscriberx1
- PoE Injector.x1
- AC Power Codex1
- Power adaptor.....x1
- Mounting Kitx1
- Product CD.....x1
- Quick Installation Guide.....x1

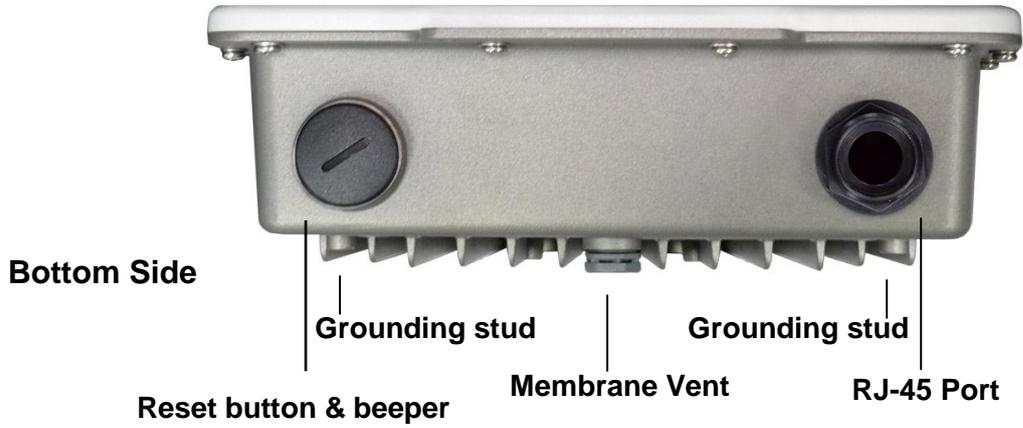


If any item on the above list is not included or damaged, please contact your local vendor for support.

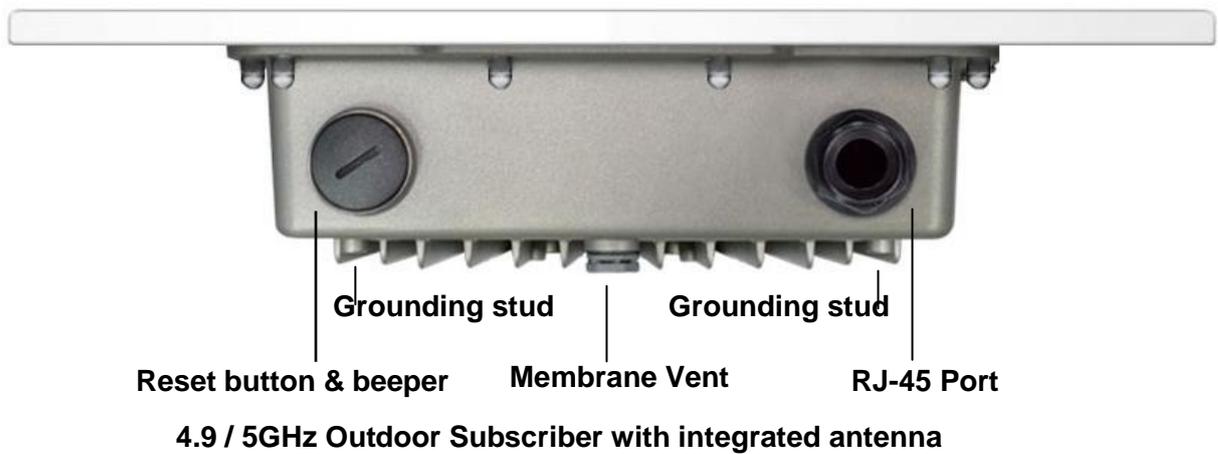
■ **MECHANICAL DESCRIPTION**

Please refer to the following table for the meaning of each feature.

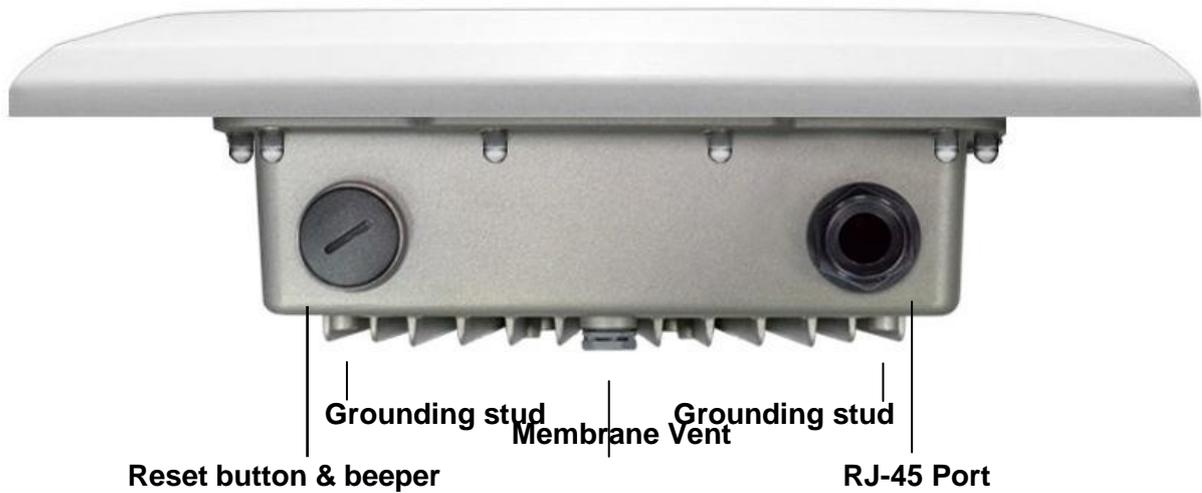
ODU: (External antenna)



ODU: (integrated with 4.9/5GHz 23 dBi panel antenna)



ODU : (integrated with 2.3/2.4GHz panel antenna)



2.3 / 2.4GHz Outdoor Subscriber with integrated antenna

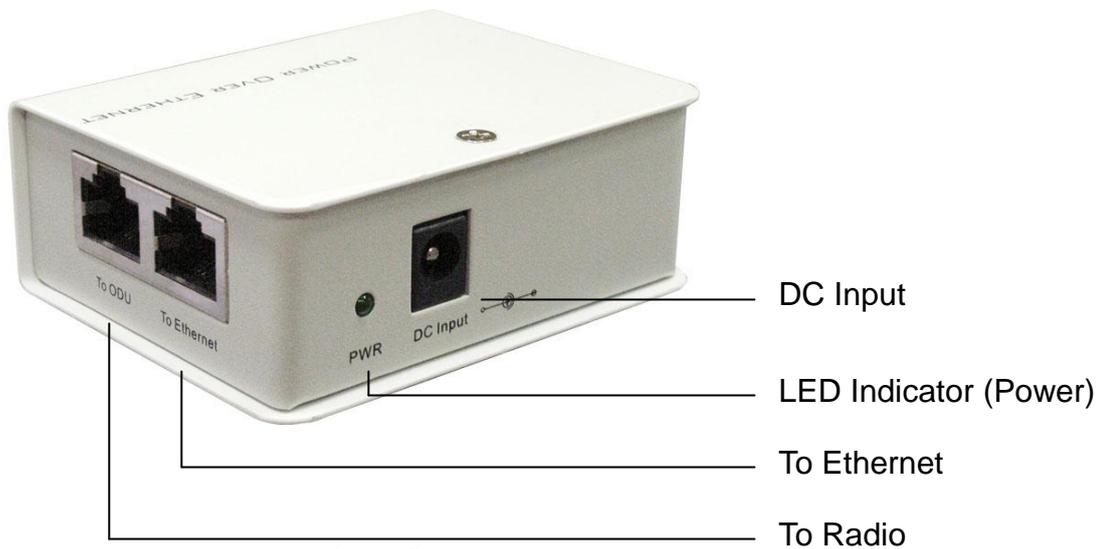
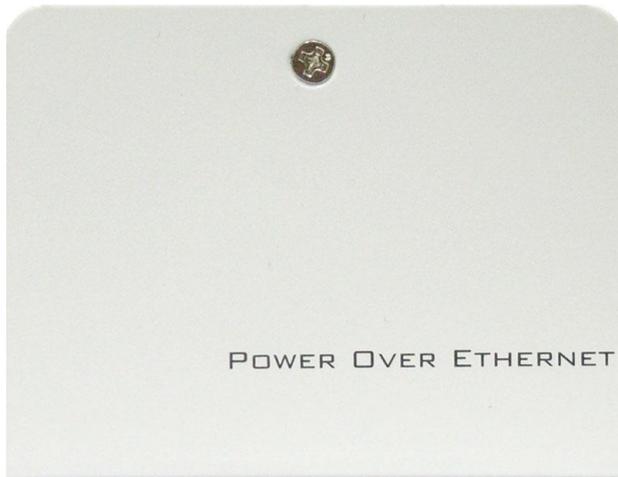
1	RJ-45 Port	Use the SFTP cat.5 cable with weatherproof connector to connect to the "To ODU" side of the POE injector.
2	N- Jack Antenna Connector	Here you can attach the proper antenna with the outdoor radio to wirelessly connect to the networks. In order to improve the RF signal radiation of your antenna, proper antenna installation is necessary.
3	Grounding stud	Connect to the ground conductor with the ground wire.
4	Reset button	Revolve the plastic cap by coin, you will see the reset button. Press it and hold the for 5~10 seconds, the radio will back to factory default settings.
5	Beeper	This function only works at PTP bridge and station adapter mode (or CPE mode) in the AP to CPE application, plug the headphone after remove the plastic cap, and check the signal level of the beeper for antenna alignment via headphone.
6	Membrane Vent	<ol style="list-style-type: none"> 1. Moisture vapor permeable to help aid in condensation and fogging reduction in the ODU. 2. High airflow allows pressure equalization to prevent stress on enclosure seals

Note: screw the cap back well after you use the reset button or beeper.



This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

24VDC POE



Power Over Ethernet Injector Figure

1	To Ethernet	This RJ-45 port is used to connect to the 10/100 Base T complied device such as switch, router or PC.
2	To ODU	This RJ-45 port is used to connect to the ODU.
3	DC Input	Connect to the Power adaptor for DC input.
4	LED Indicator	Power LED

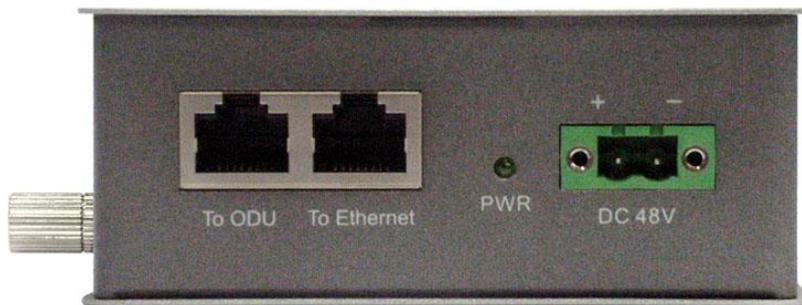


Power Over Ethernet Injector is not waterproof unit, should not be exposed to the outdoor without any protection.

+/- 48VDC POE (optional solution)



Grounding stud



Power Over Ethernet Injector Figure

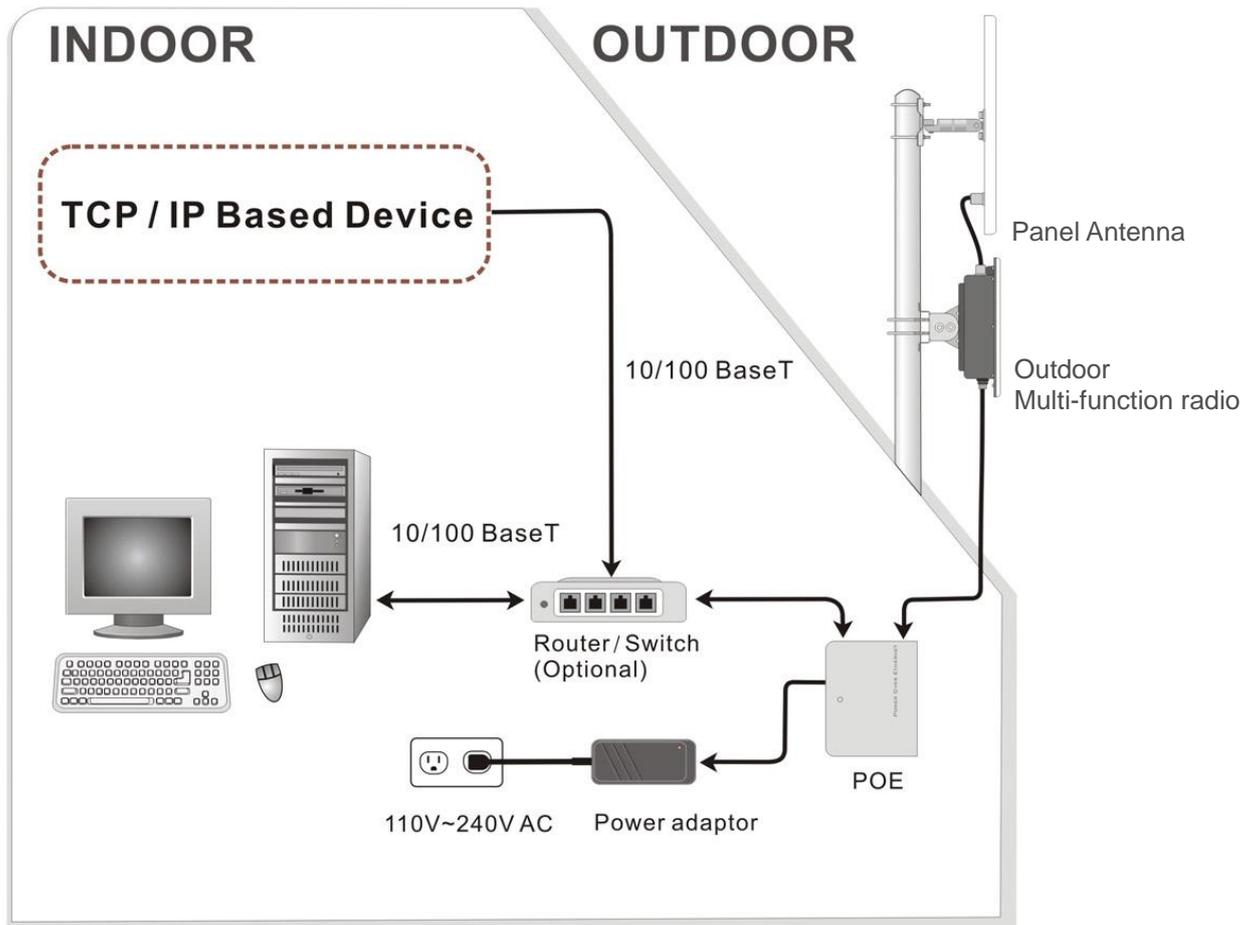
1	To Ethernet	This RJ-45 port is used to connect to the 10/100 Base T complied device such as switch, router or PC.
2	To ODU	This RJ-45 port is used to connect to the ODU.
3	DC Input	Connect to the Power adaptor for DC input.
4	LED Indicator (PWR)	Power LED
5	Grounding stud	Connect to the ground conductor with the ground wire.

■ INSTALL THE OUTDOOR SUBSCRIBER

This section show you how to mount the Outdoor Subscriber, please read it carefully before you start to install the hardware. Be safe and step by step to finish the hardware installation.

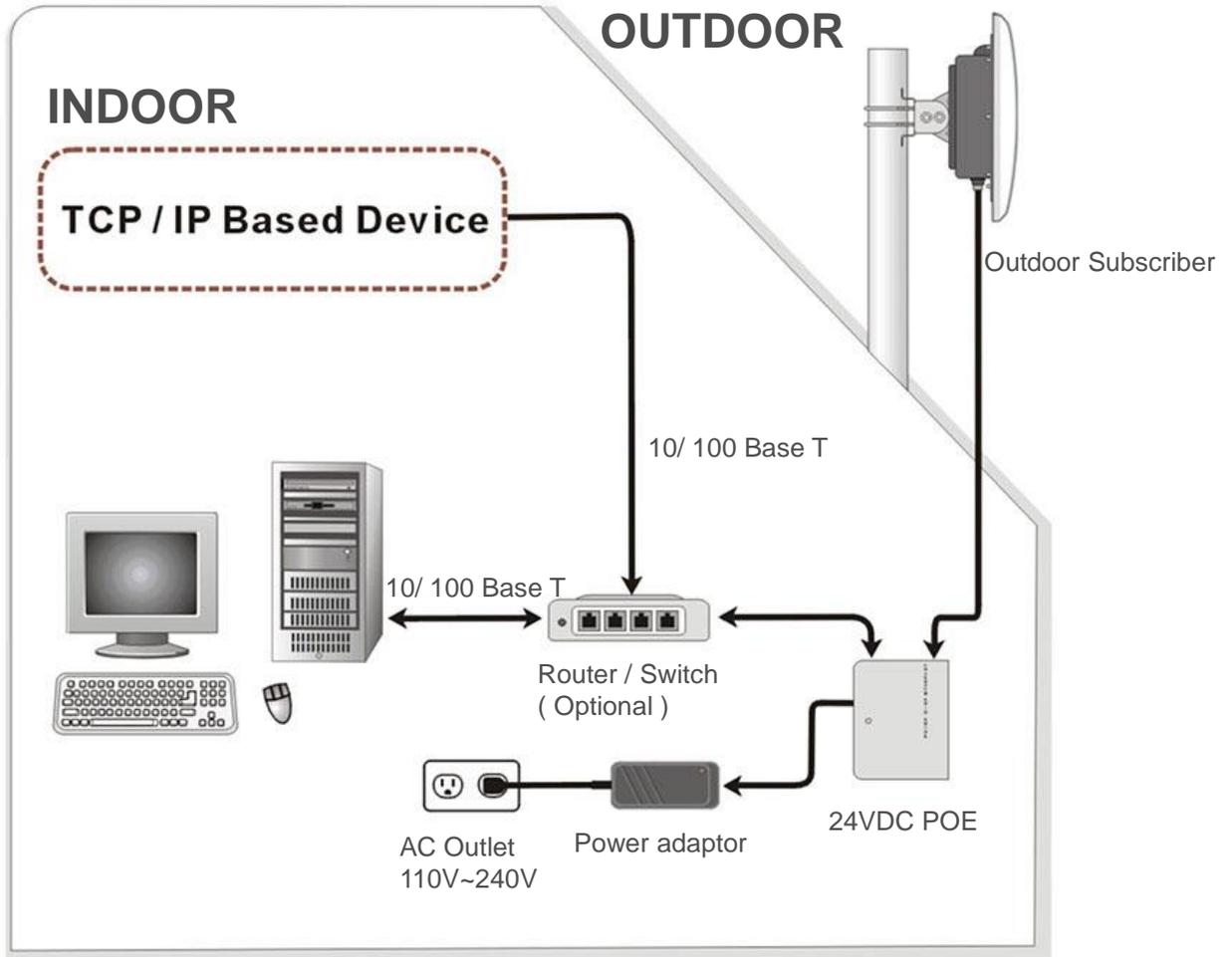
External antenna

(With 24VDC POE)



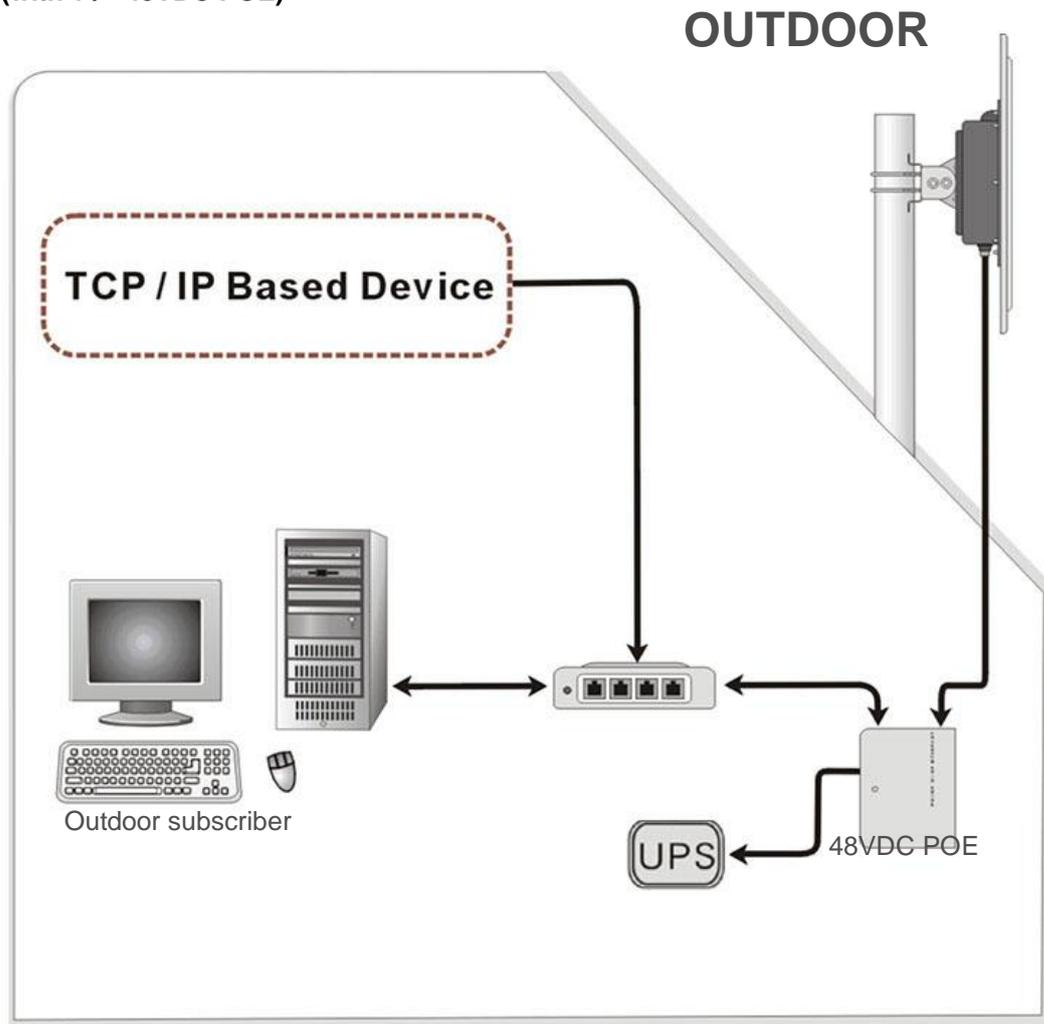
Hardware Installation Figure

Integrated with 2.3/2.4GHz panel antenna
(With 24VDC POE)



Hardware Installation Figure

Integrated with 4.9/5GHz panel antenna
(with + / - 48VDC POE)



Hardware Installation Figure



The Outdoor Subscriber and power injector can be damaged by incorrect power application. Read and follow the installation instructions carefully before connecting the system to its power source.

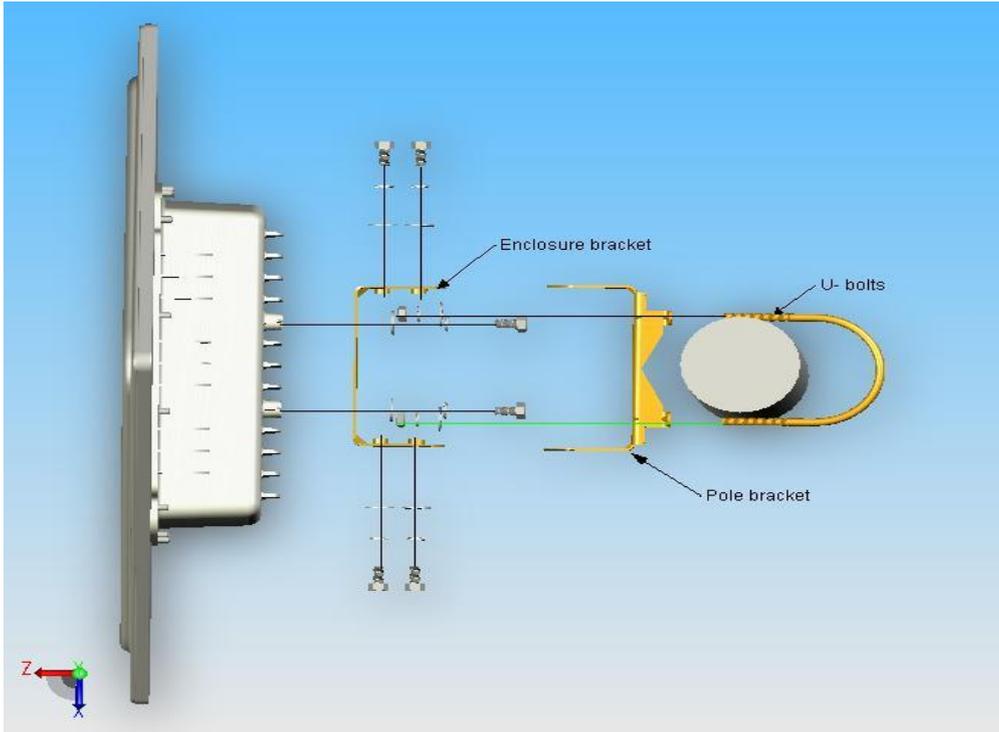
1. Mounting the Outdoor Radio

There are two parts of the Mounting kit:

- Enclosure bracket — attached to the back of the outdoor radio.
- Pole bracket — mounted on the pole or tower with the U-bolts.

Follow the next steps to mount the Outdoor Subscriber on the pole.

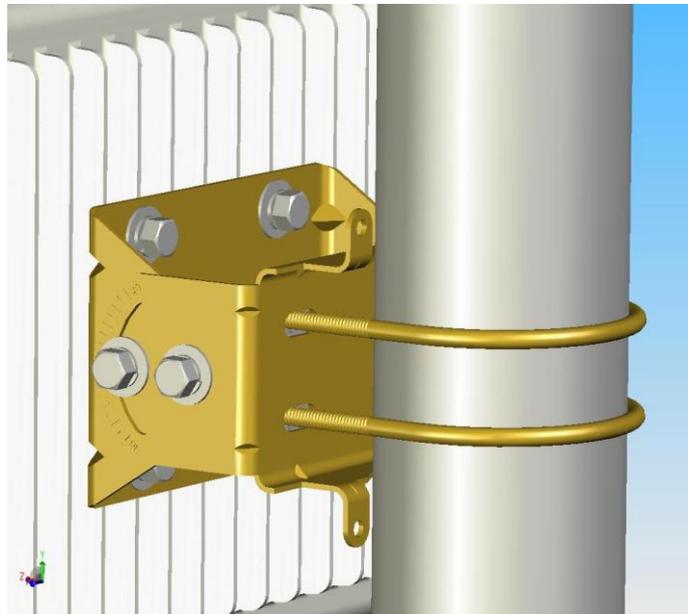
- i. Mount the enclosure bracket to the back of the outdoor radio.
- ii. Mount the pole bracket to the pole with the U-bolts.
- iii. Attach the radio with enclosure bracket to the pole bracket which was mounted on the pole with the supplied screws and U-bolts.
- iv. Tighten the all the screws, U-bolts, washers and nuts with hand tools.



Mounting Explosion Assembly Figure



Only trained and qualified personnel should be allowed to install, replace, or service this equipment.



Mount the enclosure on the pole



This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

2. Connect the Ethernet Cable

The Outdoor Subscriber support 10/100M Ethernet connection. Attach your SFTP cat.5 Ethernet cable with waterproof connector to the RJ-45 connector on the ODU enclosure. Then connect the other end of the cable to the “To ODU” side on PoE injector.



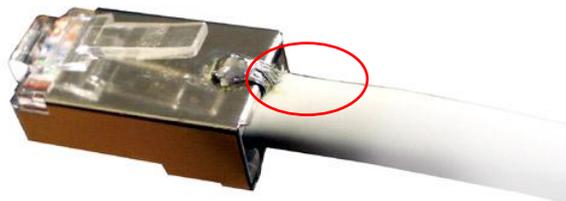
Connect the SFTP cable to the Outdoor Multi-function Radio



Connect the SFTP cable to the Outdoor Subscriber



Welding the shielding parts of the SFTP cable and the RJ-45 connector well to ensure the performance of the system and avoid the moisture leak into the radio.



Weld the RJ-45 connector with the SFTP cable



Weld the SFTP cable as the above figure, make sure the welding parts NOT bigger than the figure, or it will affect the function of waterproof RJ-45 connector.

3. Attached the antenna

You can attach the proper antenna to the N-type connector on the Outdoor Radio.



To meet regulatory restrictions, the radio and the external antenna must be professionally installed.

4. Connect the ground stud

Connect the ground stud on the ODU enclosure with the ground wire.



This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

5. Connect the Power Cable

Connect the power adapter to the POE injector, and plug the other end of the electrical outlet (AC 110V~240V).

The polar of the circle connector is: 

6. Align the antenna by the earphone for your i-pod (Beeper)

This beeper function only works at point to point mode or station adapter mode (or CPE mode) in the AP to CPE application, plug the earphone adapter after remove the metal Vent and hear the signal level of the beeper for antenna alignment via earphone at CPE site.

You can hear different tempo of beeper in different signal strength , there are 5 signal levels totally, please refer to the following list.

Signal level	1(Min)	2	3	4	5(Max)
RSSI	-92~-88dBm	-87~-78dBm	-77~-63dBm	-62~-43dBm	-42~+10dBm
Tempo	1 beats/ 2sec	1 beats/sec	2 beats/sec	4 beats/sec	8 beats/sec



Beeper function in the plastic CAP for audible antenna alignment



Please screw the Membrane Vent well after finish the alignment for water-proof purpose.



We cannot assume the responsibility for the damage from using with the other power adapter supplier.



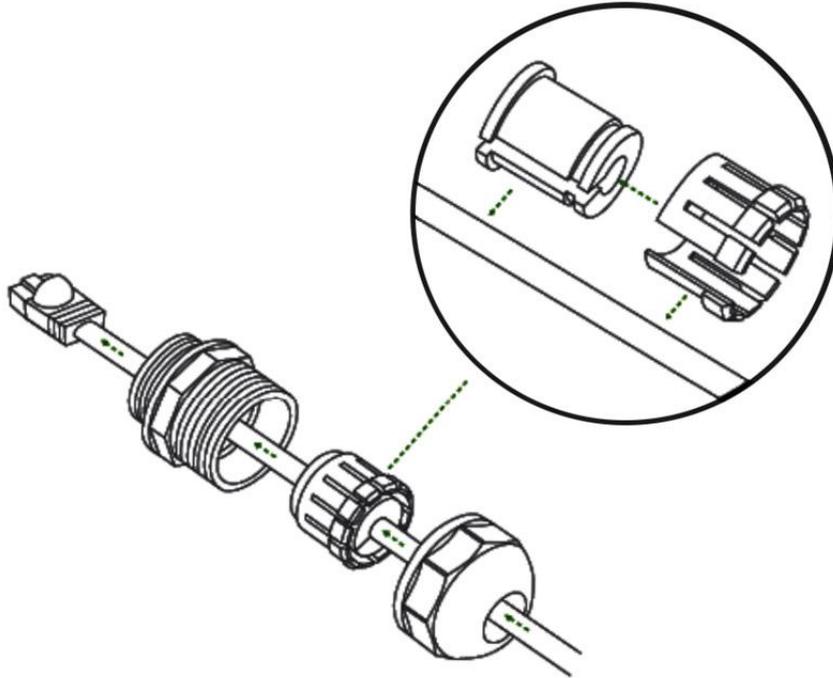
You should read and follow the installation instructions carefully before connecting the system to its power source. The radio and power injector can be damaged by incorrect power application.



Wind the water-resistant adhesive tape around the RJ-45 and N-type connector on the outdoor radio as the last step of the hardware installation procedures.

Appendix 1 — How to make the SFTP cable with waterproof connector between the radio and POE injector.

The waterproof connector was formed by 3 pieces components as the following exploded view:



Blow is the complete figure for reference:



Long Distance Wireless Backhaul 5GHz OFDM TDMA Lite 18 & 23 dB Outdoor Subscriber

User Manual

Includes install, configuration and trouble shooting information for the broadband wireless access outdoor radio.

Version 3.0.1

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About This Manual

This manual includes install, configuration and trouble shooting for the 5GHz Lite outdoor subscriber. It can help you in avoiding the unforeseen problems and use the outdoor radio correctly.

Technical Support

If you have difficulty resolving the problem while installing or using the wireless bridge, Please contact the supplier for support.

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Conventions

This publication uses the following conventions to convey instructions and information:



This symbol means ***reader take note***. Notes contain helpful suggestions or references to materials not contained in this manual.



This symbol means ***reader be careful***. In this situation, you might do something that could result in equipment damage or loss of data.



This warning symbol means ***danger***. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

Chapter 1 Introduction

With highly-powered OFDM-TDMA technology, this outdoor lite-subscriber is a high capacity point-to-point backhaul for 5GHz ISM band wireless deployment in long distance. 5/10/20/40 MHz adjustable channel bandwidth provides the flexibility of deployment channel plan or high capacity backhaul -- truly throughput up to 50Mbps.

It utilizes Time Division Duplex technology allowing operation on a single channel with different uplink / downlink ratio. This improves the efficiency of channel BW usage rate. The Ethernet products are primarily designed to provide standard Ethernet interface in a wireless link between distant sites.

This lite-subscriber has powerful security management because it supports WEP-128bits, AES-256 bits encryption, and use the proprietary protocol. All these functions make the network much more secure and reliable.

■ 1-1 Features and Benefits

■ Effective spectrum utility / variable capacities

This radio has 4 kinds of channel bandwidths (5/10/20/40 MHz) for optional, which is adjustable via software. This function provides flexibilities of channel plan and variable capacities for different applications.

■ OFDM-TDMA technology improves the performance in long distance

This radio improves the throughput performance up to 50~70% in long distance due to the better efficiency of OFDM-TDMA technology, that means the system has the same performance with lower EIRP (smaller antenna) compare to other standard wifi products.

■ Time-Division Multiplexing Access technique

TDMA tech can avoid the packets collision and send the packets more efficient and stable to improve the quality of wireless transmission in long distance.

■ High output power OFDM technology and Integrated antenna

Integrated panel antenna type with the high output power OFDM technology provides best performance and lowest price at the same time support this radio to be the most cost effective solution in the long distance wireless backhaul market.

■ Proprietary Security

This radio uses proprietary protocol, which means other standard wifi products can't connect to this radio. It also provides WEP-128bits and AES-256bits encryption to build the highest security mechanism to prevent the malicious attacking from the internet.

■ Antenna Alignment (Audible antenna alignment)

The site survey function provides the RSSI (signal strength) info to indicate the status of antenna alignment. The radio also supports audible antenna alignment for aligning the antenna by the earphone of your mp3 player, quite easy and

simple.

■ FEATURES

- Provides the easy installation and high performance outdoor PTP / PTMP wireless backhaul up to 20 KM for Lite 18 dB and 40 km for 23 dB version.
- With a data rate up to 6Mbps / 12Mbps / 24Mbps / 48Mbps (with different bandwidth: 5MHz / 10MHz / 20MHz / 40MHz), customer can select the suitable bandwidth via the software.
- Technique operating in the 5GHz.
- Integrated 18dBi or 23 dBi panel antenna.
- Transmit Power Control :
Supports settable transmit power levels to adjust coverage cell size, ranging from full, half(50%), quarter(25%) eighth(12.5%) and min
- Provides WEP-128 bits AES-256 bits as well as MAC access control to increase security.
- Provides Web-based configuration utility, user friendly interface.
- Support SNMP (Simple Network Management Protocol) for management.
- IP-68 rated weather-proof housing

Chapter 2 Hardware Installation

This chapter describes initial setup of the lite outdoor subscriber.

Warnings



Do not work on the system or connect or disconnect cables during periods of lightning activity.



Ultimate disposal of this product should be handled according to all national laws and regulations.



Only trained and qualified personnel should be allowed to install, replace, or service this equipment.



To meet regulatory restrictions, the radio and the external antenna must be professionally installed. The network administrator or other IT professional responsible for installing and configuring the unit is a suitable professional installer. Following installation, access to the unit should be password protected by the network administrator to maintain regulatory compliance.



The 5GHz Lite outdoor subscriber and POE injector can be damaged by incorrect power application. Read and carefully follow the installation instructions before connecting the system to its power source.



Follow the guidelines in this chapter to ensure correct operation and safe use of the ISM band radio.

■ 2-1 Product Kit

Before installation, make sure that you the following items:

- ◆ 5GHz TDMA Lite outdoor subscriber.....x 1
- ◆ Power over Ethernet.....x 1
- ◆ Power Adapter.....x 1
- ◆ Power Cord.....x 1
- ◆ Mounting kit.....x 1
- ◆ Product CD.....x 1
- ◆ Quick Installation Guide.....x 1

NOTE: If any of the above items are missing or damaged, please contact your local dealer for support.

■ 2-2 System Requirements

Before installing the 5GHz Lite outdoor subscriber, please make sure that these equipments have been met:

- A 10/100 Mbps Local Area Network device such as a hub or switch. (optional)
- Category 5 UTP or STP networking cable. (From the PC to POE)
- Category 5 SSTP or SFTP networking cable. (From the radio to POE)
- A Web browser for configuration: Google Chrome – Firefox etc..
- Installing TCP/IP protocol to the computer.

■ **2-3 Mechanical Description**

Please refer to the following table for the meaning of each feature.

MECHANICAL DESCRIPTION

Please refer to the following table for the meaning of each feature.

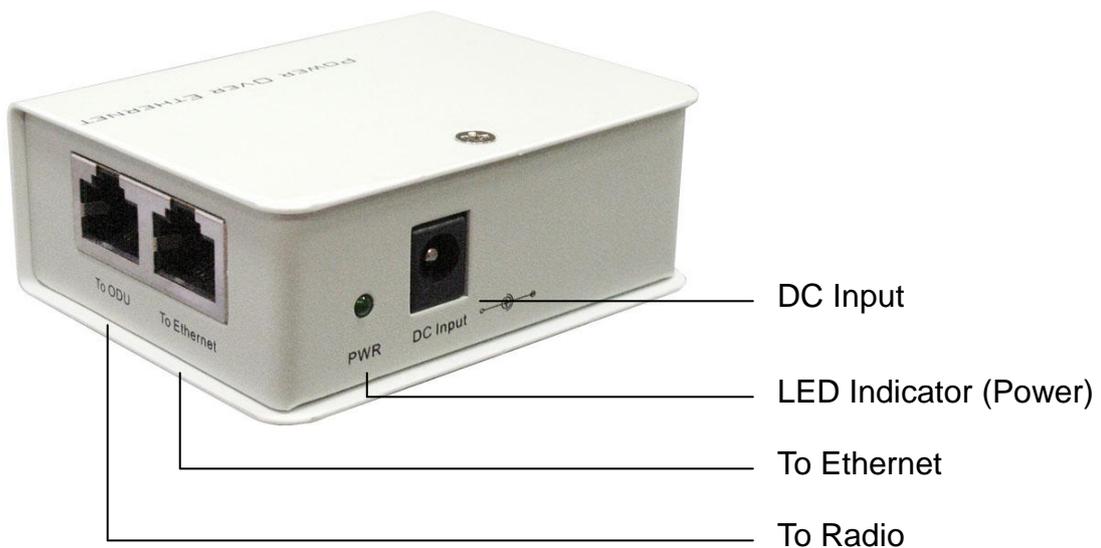
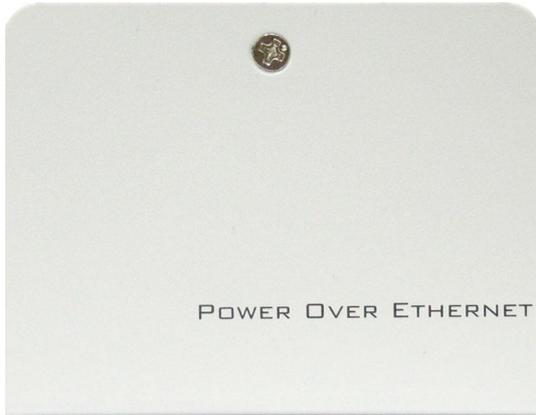


Lite Outdoor subscriber Figure

1	RJ-45 Port	Use the SFTP or UTP cat.5 cable with weatherproof connector to connect to the "To ODU" side of the POE injector.
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POE

24VDC POE



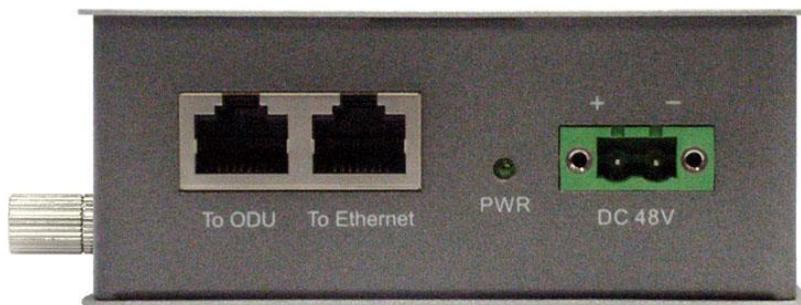
Power Over Ethernet Injector Figure

1	To Ethernet	This RJ-45 port is used to connect to the 10/100 Base T complied device such as switch, router or PC.
2	To ODU	This RJ-45 port is used to connect to the ODU.
3	DC Input	Connect to the Power adaptor for DC input.
4	LED Indicator	Power LED

+/- 48VDC POE (optional solution)



Grounding stud



Power Over Ethernet Injector Figure

1	To Ethernet	This RJ-45 port is used to connect to the 10/100 Base T complied device such as switch, router or PC.
2	To ODU	This RJ-45 port is used to connect to the ODU.
3	DC 48V	Connect to the +/- 48V DC source
4	LED Indicator (PWR)	Power LED
5	Grounding stud	Connect to the ground conductor with the ground wire.

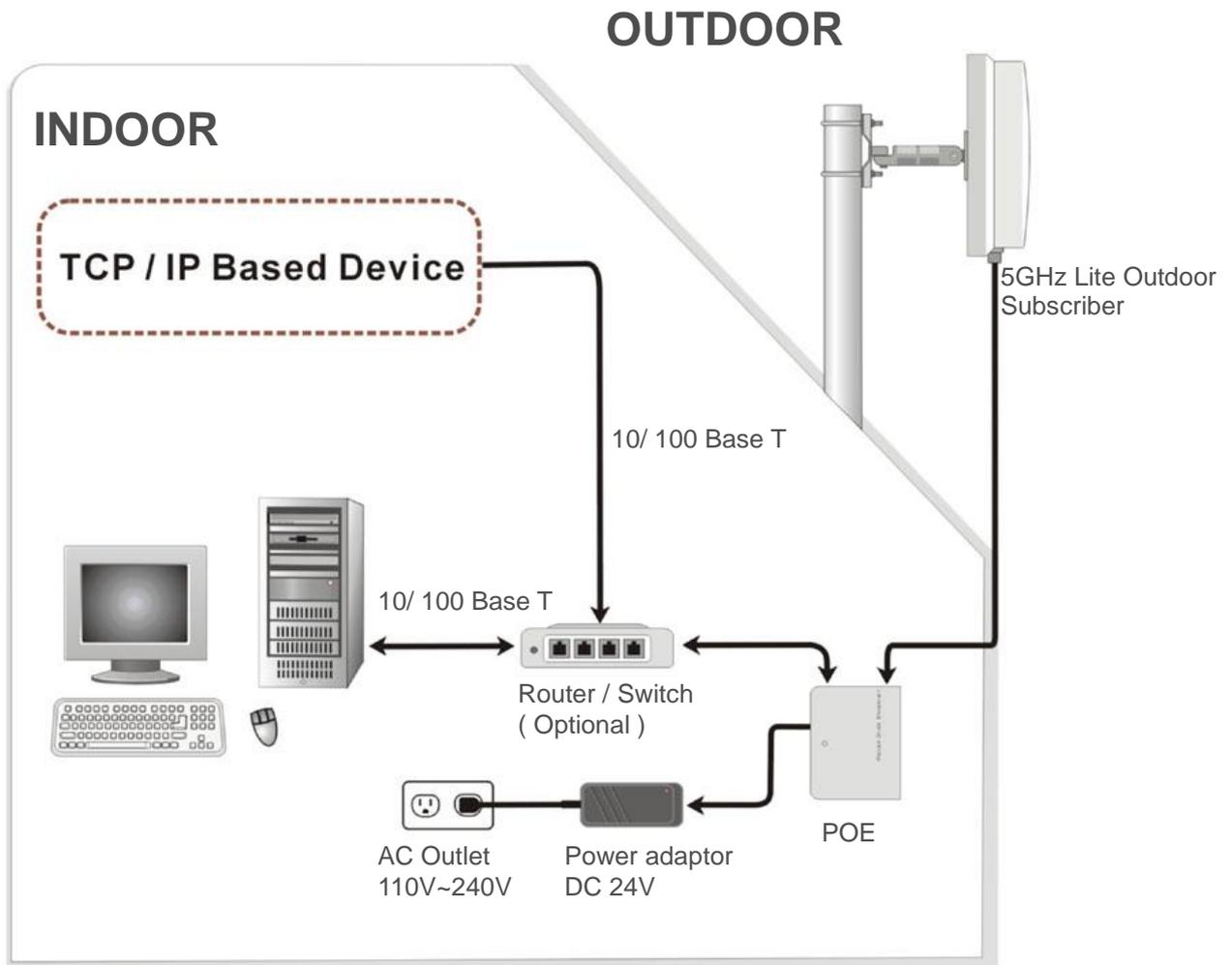
■ 2-4 Hardware Installation

The 5GHz Lite outdoor subscriber is a radio device, so it is susceptible to common causes of interference that can reduce throughput and range. Follow these basic guidelines to ensure the best possible performance:

- IF there is any other 5GHz RF device deployed around the outdoor radio, try to set the channel to the non-overlapping one.
- Install the bridge at a height sufficient place where structures, trees, or hills do not obstruct radio signals to and from the unit. A clear line-of-sight path can guarantee the performance of the RF link.

■ Site Surveys

Clear and flat area provide better RF range and data rate, on the contrary, physical obstructions such as trees, electric tower, hills or buildings can reduce the performance of RF devices. Do not deploy your radios in the location where there is any obstacle between the antennas.





Configure and verify the 5GHz Lite outdoor subscriber operations first before you mount the radio in a remote location.



Power Over Ethernet Injector is not a waterproof unit, should not be exposed to outdoor without any protection.

Chapter 3 Configuration

■ 3-1 Start-up and Log in

In order to configure the long distance backhaul, use the web browser and please do the following:

1. Type the IP address **http://192.168.1.1** of this radio in the Location (for IE) or Address field and press Enter.
2. Enter the system name (the default setting is “**admin**”) and password (the default setting is “**password**”).
3. Click on the “**Login**” button.



After you have logged-in the main page, the **About**, **Basic Setup**, **Wireless Setup**, **Status**, **Statistics**, **Management** and **Logout** buttons will be shown. The main menu provides links to the whole sections of the web configuration interface.

About

The About screen describes the product information briefly. Information of the radio includes **Device Name**, **MAC Address**, and **Firmware Version** information.

Device Information	
Device Name	DEVICE000867
MAC Address	00:1b:5c:00:08:67

Firmware	
Version	1.22
Checksum	f0f25363
Build Time	Fri Apr 15 17:46:05 2011

Basic Setup / IP Setup

The **Device Name** is used to give a name to your TDMA outdoor radio. This will enable you to manage your Wireless backhaul more easily if you have multiple radios on your network.

Ethernet Data Rate: you can choose the Ethernet data rate you need



VLAN (802.1Q): enable this feature and assign a management Vlan ID to the radio. Those PC without same Vlan ID will not be allowed to connect this radio and configure it.

IP Address: Type the IP address you want to set to your TDMA outdoor radio (Default: 192.168.1.1).

IP Subnet Mask: The Wireless backhaul's Subnet Mask must be the same as your Ethernet network. We recommended that you do NOT change the value. (Default: 255.255.255.0).

Default Gateway: The Wireless backhaul will use this value for default Gateway.

Primary DNS Server: The Wireless backhaul will use this value for primary Domain Name Server.

Secondary DNS Server: The Wireless backhaul will use this value for secondary Domain Name Server.

Basic Setup / STP Setup

Spanning tree protocol (STP): You may Enable or Disable the Spanning Tree Protocol used in this radio.

The screenshot shows the 'Spanning Tree Protocol Settings' page. On the left is a navigation menu with 'Long Distance Backhaul' at the top and options: About, Basic Setup, IP Setup, STP Setup (highlighted), Wireless Setup, Status, Statistics, Management, and Logout. The main content area is titled 'Spanning Tree Protocol Settings' and contains the following fields:

- Spanning Tree Protocol (STP):** Enable Disable
- Bridge Priority (0-65535):
- Hello Time (1-10): seconds
- Max Age (6-40): seconds
- Forward Delay (2-30): seconds
- Advanced**
- Wireless Node Aging (15-600): seconds

At the bottom of the settings area are 'Apply' and 'Cancel' buttons.

Note: If you complete the settings, please click on “Apply” for changes to take effect.

■ 3-2 Wireless Setup

Wireless Setup / Radio Settings

The screenshot shows the 'Radio Settings' page. On the left is a navigation menu with 'Long Distance Backhaul' at the top and options: About, Basic Setup, Statistics, Wireless Setup (highlighted), Radio (highlighted), Security, Flow Control, Status, Throughput, Management, and Logout. The main content area is titled 'Radio Settings' and contains the following fields:

- Radio Frequency (RF):** Enable Disable
- Operating Mode:** Base Station (dropdown)
- Group Name:
- Time Slot (10 - 100): ms
- Upload Stream Time Ratio (20 - 80): %
- Basic Parameters**
- RF Bandwidth: 20MHz (dropdown)
- Channel / Frequency: 5560.000MHz (dropdown)
- TX Rate Range: BPSK 1/2 (dropdown) - 64QAM 3/4 (dropdown)
- TX Power: full (dropdown)
- Fragmentation Length (276-2346): Auto

At the bottom of the settings area are 'Apply' and 'Cancel' buttons.

Radio Frequency (RF): You can enable/disable the RF interface.

Group Name: Base station and CPEs in same network must have the same Group name.

Operating Mode:

Base Station : The default mode is Base Station.

CPE : Perform as a client station associated to other APs. Be sure that they share the same SSID when connected.

Time Slot: Time slot divide using time between every client, default is 10ms. (only available in base station mode)

Upload Stream Time Ratio: Decide upload (CPE to BS) packets time ratio of every time slot, default is 50%. (only available in base station mode)

Only Base Station: Set the MAC of base station, this CPE can only connect to the base station with this MAC address. (Only available in CPE mode)

RF Bandwidth: Decide bandwidth of Radio Frequency. Including 5 / 10 / 20 / 40 MHz, default is 20MHz.

Channel / Frequency: Set the operation frequency of the radio.

TX Rate Range: Normally choice transmission rate as “Best”, system will adapt best rate for real environment.

Including:

- 64QAM 3/4, (54Mbps)
- 64QAM 2/3, (48Mbps)
- 16QAM 3/4, (36Mbps)
- 16QAM 1/2, (24Mbps)
- QPSK 3/4, (18Mbps)
- QPSK 1/2, (12Mbps)
- BPSK 3/4, (9Mbps)
- BPSK 1/2, (6Mbps)

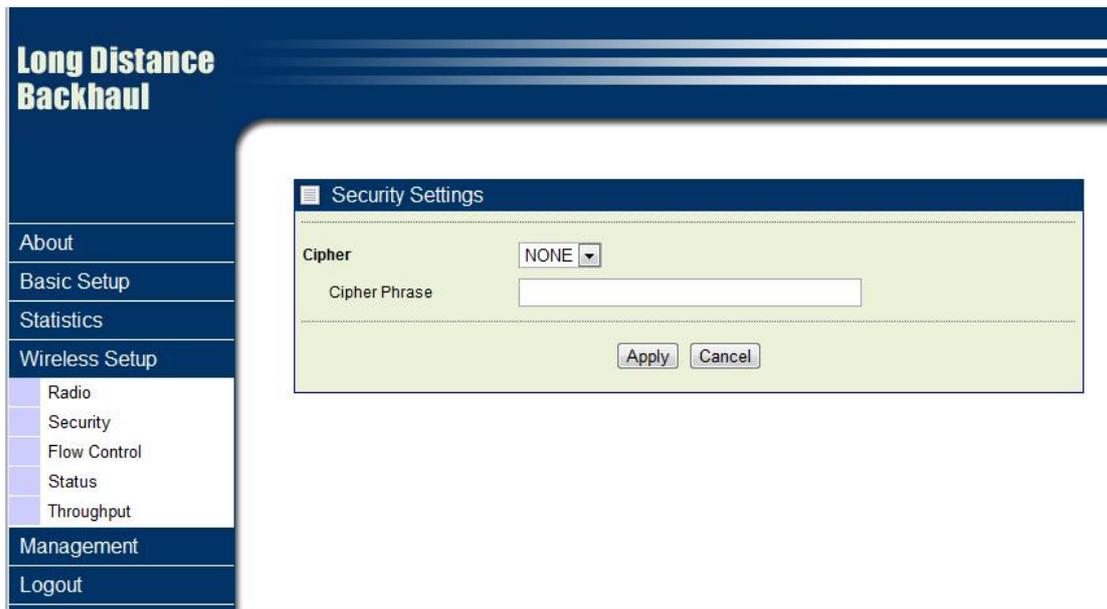
TX Power :

Setting power of TX, default is Full 23 dBm

- Half = full - 3 dBm
- Quarter = full - 6 dBm
- Eighth = full - 9 dBm
- Min = full -12 dBm

Fragmentation packet length:

Decide the length of the maximum fragmentation packet. When packet is large than setting, it would divide to smaller segment package. By default, it will divide the length of segment packet automatic



Security/Cipher To prevent unauthorized radios from accessing data transmitted over the link, the Encryption Settings window offers WEP/AES features, making your data transmission over air more secure and allows you to specify Encryption Key(s) if you enable encryption for the radio. There are three degrees of encryption could be selected: **NONE, 128 bits WEP and 256 bits AES.**

Security/Cipher Phrase After you select the encryption, please key-in the same phrase in this field of the both radios (local and remote) and then press apply, radio will generate a password automatically.

Flow control Flow control is the process of managing the rate of data transmission

between two nodes to prevent a fast sender from outrunning a slow receiver. It provides a mechanism for the receiver to control the transmission speed, so that the receiving node is not overwhelmed with data from transmitting node.

Long Distance Backhaul

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 - Security
 - Flow Control
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Flow Control

Flow Control Enable Disable

<input type="checkbox"/>	MAC Address	Max Rate	
<input checked="" type="checkbox"/>	00:1B:5C:00:00:00	2 Mbps	Add
<input checked="" type="checkbox"/>	00:1b:5c:00:00:00	2 Mbps	Delete

Apply Cancel

Status / Connections

The connections page provides below information: **Time**, **MAC Address** (remote radio), **IP Address** (remote radio), **channel info** (RF bandwidth / frequency), **Rx rate**, **Tx rate**, **RSSI**, **remote RSSI** and **Best Remote RSSI**.

Long Distance Backhaul

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Status

CPE List

ID	MAC Address	IP Address	RSSI	Rx Rate	Remote RSSI	Tx Rate
2	00:1b:5c:00:08:68	192.168.1.1	-45dBm	64QAM 3/4	-44dBm	64QAM 3/4

Refresh

Statistics

The Statistics screen provides various Ethernet and Wireless TX/RX packet statistics. Click the **Refresh** button to update the statistics on this screen.

Long Distance Backhaul

Statistics

Ethernet Statistic

	Received	Transmitted
Packets	1930	2206
Bytes	243774	416314

Wireless Statistic

	Received	Transmitted
Unicast Packets	510	513725
Broadcast Packets	270	0
Multicast Packets	472	0
Total Packets	1744	513725
Total Bytes	182901	30403911

Refresh

■ 3-4 Management

Management / Change Password

This page allow you to change password of the TDMA outdoor radio.

Long Distance Backhaul

Change Password

Current Password

New Password

Repeat New Password

Restore Default Password Yes No

Apply Cancel

1. Key in the current password in the “Current Password” filed. Default password of

this radio is “password”

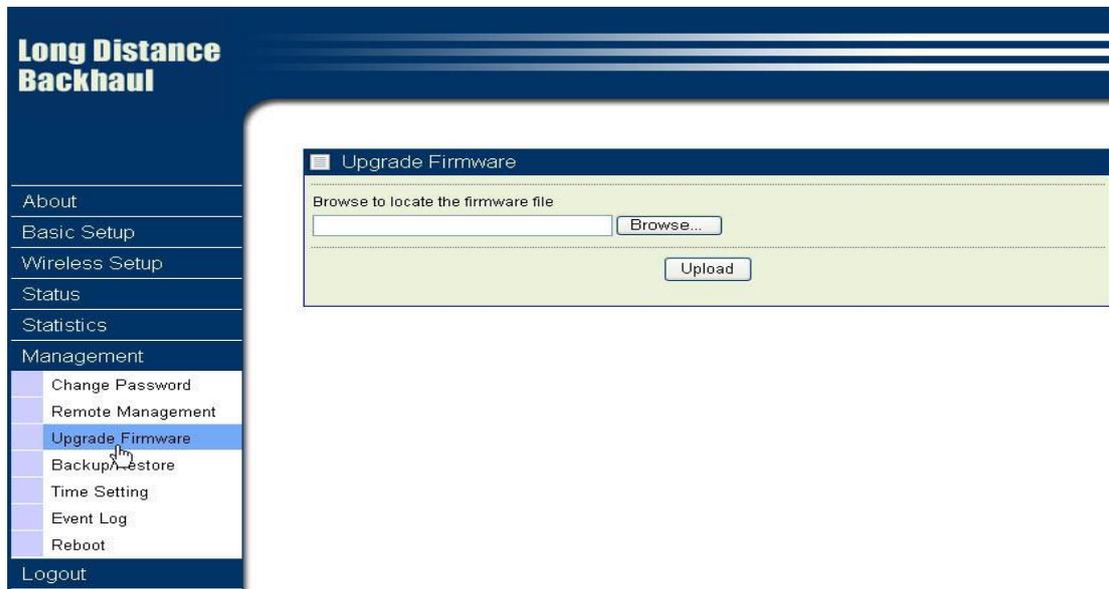
2. Key in the new password to the New Password field, and then type it again into the Repeat New password field to confirm the new password.
3. Click the “Apply” button to active the settings.
4. You can restore to default password too by check the “yes” option.

Note: After you change password, please take note of your new password. Otherwise, you will not able to access the radio with correct password.

Management / Upgrade Firmware

The Upgrade Firmware menu will display the Upgrade Firmware page, you can update the latest firmware to the TDMA outdoor radio.

Please make sure that you are using the latest and correct firmware before you doing the upgrade procedure.



Below are the upgrade procedures:

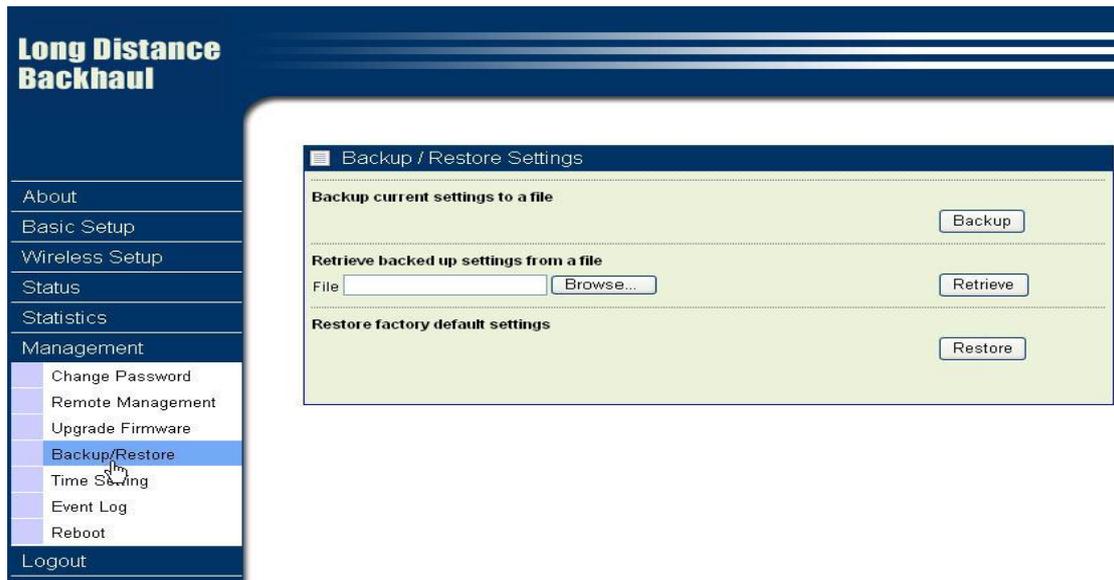
- Using browser to access the main page of the TDMA outdoor radio
 1. Select “Upgrade Firmware” from the **Management** page.
 2. Input the exact file path and name or select the file by clicking **Browse** button, then press **Upload** button to upgrade the firmware.
 3. Please wait for few seconds.
- If download fail, please repeat the step 1~3 to download again.

Note! Do not power off the unit when it is being upgraded.

Management / Backup / Restore Settings

The current system settings can be saved into a file as a backup by clicking “**Backup**”. The saved file can be loaded back on the radio by clicking “**Browse**”. When you

have selected the settings file, click “**Retrieve**” to begin the process. Furthermore, you may click “**Restore**” to factory default settings.



Management / Time Setting

The current system settings can be saved into a file as a backup by clicking “**Backup**”. The saved file can be loaded back on the radio by clicking “**Browse**”. When you have selected the settings file, click “**Retrieve**” to begin the process. Furthermore, you may click “**Restore**” to factory default settings.

Time: While you connect this Wireless backhaul to Internet, it could automatically synchronize the current time with the Time Server that you have set.

Time Server: the central time of the Time Server.

Time Server Port: the port of the Time Server.

Time Zone: You may select the appropriate local time zone for your radio from a list of all available time zones. Default: GMT.

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 - Reboot
- Logout

Time Setting

Time

Time Server

Time Server Port

Time Zone

Adjust for Daylight Saving Time

Current Time Wed May 12 04:29:00 2010

- (GMT-12:00) International Date Line West
- (GMT-11:00) Midway Island, Samoa
- (GMT-10:00) Hawaii
- (GMT-09:00) Alaska
- (GMT-08:00) Pacific Time (US & Canada); Tijuana**
- (GMT-07:00) Arizona
- (GMT-07:00) Chihuahua, La Paz, Mazatlan
- (GMT-07:00) Mountain Time (US & Canada)
- (GMT-06:00) Central America
- (GMT-06:00) Central Time (US & Canada)
- (GMT-06:00) Guadalajara, Mexico City, Monterrey
- (GMT-06:00) Saskatchewan
- (GMT-05:00) Bogota, Lima, Quito
- (GMT-05:00) Eastern Time (US & Canada)
- (GMT-05:00) Indiana (East)
- (GMT-04:00) Atlantic Time (Canada)
- (GMT-04:00) Caracas, La Paz
- (GMT-04:00) Santiago
- (GMT-03:30) Newfoundland
- (GMT-03:00) Brasilia
- (GMT-03:00) Buenos Aires, Georgetown
- (GMT-03:00) Greenland
- (GMT-02:00) Mid-Atlantic
- (GMT-01:00) Azores
- (GMT-01:00) Cape Verde Is.
- (GMT) Casablanca, Monrovia
- (GMT) Greenwich Mean Time: Dublin, Edinburgh, Lisbon, London
- (GMT+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna
- (GMT+01:00) Belgrade, Bratislava, Budapest, Ljubljana, Prague
- (GMT+01:00) Brussels, Copenhagen, Madrid, Paris

Management / Event Log

Long Distance Backhaul

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Event Log

Enable SysLog

Syslog Server IP Address: 0.0.0.0

Syslog Server Port Number: 514

Apply Cancel

Event Log Window

```
Wed May 12 04:13:23 2010 WLANO: AP 00:1B:5C:00:06:8F associated.
Wed May 12 04:13:23 2010 WLANO: AP 00:1B:5C:00:06:8F disassociated.
Wed May 12 04:13:17 2010 WLANO: AP 00:1B:5C:00:06:8F associated.
Wed May 12 04:13:15 2010 WLANO: 00:1B:5C:00:06:90 is ready in service.
Wed May 12 04:13:15 2010 WLANO: 00:1B:5C:00:06:90 stop service.
Wed May 12 04:13:11 2010 WLANO: 00:1B:5C:00:06:90 is ready in service.
Wed May 12 04:13:11 2010 WLANO: 00:1B:5C:00:06:90 stop service.
Wed May 12 04:13:11 2010 WLANO: 00:1B:5C:00:06:90 is ready in service.
```

Refresh Save As...

Enable SysLog if you have a Syslog Server on your network environment. If enable, you need to input the Syslog Server IP Address (default is 0.0.0.0) and the port number your Syslog Server is configured to use. The default port number is 514. The Event Log Window lists Wireless backhaul events. Click on “Refresh” to update the network events or “Save As...” to save the event into a file on your computer. Click “Apply” if you made any changes.

Management / Reboot

Long Distance Backhaul

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Reboot

Reboot System: Yes No

Apply Cancel

The Reboot screen enables you to reboot your TDMA outdoor radio if any changes are made and you want to refresh the radio, you need to reboot the TDMA outdoor

radio Select the “**Yes**” check box and click “**Apply**”. It will take you about 50 seconds to go through reboot. The Web-browser will not be accessible until the Wireless backhaul has finished its reboot process.

Management / Logout

Click log out when you finished all the configuration, if there is anything missed, you can selected “login again” to enter the configuration process again.



Appendix A: Trouble shooting

This Appendix helps you to isolate and solve the problems with the 5GHz TDMA lite outdoor subscriber. Before you start troubleshooting, it is important that you have checked the details in the product user manual and QIG.

In some cases, rebooting the unit clears the problem. If the radio still can't work well, please try to contact your local vendor or supplier.

■ General Descriptions

To successfully use the radios, engineers must be able to troubleshoot the system effectively. This section will show you how an 5GHz TDMA outdoor radio could be analyzed in the case of "no link," usually, we think that the link is down because there is no traffic being passed. The four main reasons that a link may not work are listed as below:

- Configuration
- Path issues (such as distance, obstacles, RF reflection...)
- Personal reasons (careless mounting or the incorrect connection.)
- Hardware (includes the radio, cable and connectors...etc. In few cases, the radio will conflict with the laptop or PC)
- Environment (anything that is outside the equipment and not part of the path itself)

After verified the correct configuration, double-checked the path terms, ensure no personal reasons and the hardware works well in the office, but the user still report that the link does not work. Most likely, the problem reported is caused by the environment or by improper tests to verify the connection. Assumes that the test method, cabling, antennas, and antenna alignment have been checked, (Always ensure this before checking the environment.) then you can do the follow to check the environment.

General Check

Two general checks are recommended before taking any action:

- Check whether the software version at both sides is the most current
- Check for any reported alarm messages in the Event Log

Analyzing the Spectrum

The best way to discover if there is a source of interference is to use the spectrum analyzer. By turning the antenna 360 degrees, you can find out which direction is the interference coming from. It will also show the frequencies and the level of signal is detected.

Avoiding Interference

When a source of interference is identified and when the level and frequencies are known, the next step is to avoid the interference. Some of the following actions can be tried:

- Change the RF channel to the one away from the interference source
- Change the polarization of the antenna; try to change to a polarization different from the interferer.
- A small beam antenna may help. (Such as some grid or dish antenna, align the antenna in to the particular direction will reduce the affects from the interference source) This solution cannot help when the source of interference is right behind the remote site.

Before checking for interference, ensure all the hardware works well and configurations are correct. The path analysis, cabling and antennas should be checked as well.

■ Connection Issues

This section describes several common troubles the customer might have while setting the radios.

Radio Does Not Boot

When the Radio does not Boot, do the following steps to check your whole system:

1. Ensure that the power supply is properly working and correctly connected.
2. Ensure that all cables are workable and connected correctly.
3. Check the power source.

Cannot use the Web Interface

If the radio boot, but can't enter it via the Web site.

1. Open a command prompt window and enter **ping <ip address unit>** (for example: **ping**

192.168.1.1). If there is no response from the radio, make sure that you the IP address is correct. If there is response, the Ethernet connection is working properly, do the next step.

2. Make sure that you are using one of the following Web browsers:

- Microsoft Internet Explorer version 5.0 or later

3. Ensure that you are not using a proxy server for the connection with your Web browser.

Double-check the physical network connections (includes the cables and the connectors). Use a well-known unit to ensure the network connection is properly functioning.

■ **Configuration Issues**

The following problems relate to setup and configuration problems.

Some basic configurations might make the link fail, below are the major ones:

- RF Channel
- Group name
- IP address
- Rule of MAC address filter
- Rule of security settings (such as WEP or WPA)

If the links of the two radios works within close distance of each other, then there are two possible reasons why wireless connectivity is not possible while the 5GHz TDMA outdoor radios are at their desired locations:

- RF path, for example, a bad antenna alignment, the tower is not tall enough when the radios are installed in a long distance or the connector do not attachment well...etc (these are the most common problems in installations)
- Interference problem caused by a high signal level from another unit. The interference can be checked by changing the frequency and then see if another channel works better. Or you can change the polarization of the antenna as a way of avoiding the interfering signal. To know in advance how much interference is present in a given environment, a Spectrum Analyzer can be attached to a (temporary) antenna for measuring the signal levels on all available Channels.



If the link still not works after resetting the configurations, checking the connectors and cables, double-check the path and environment issues, then the problem is possible a hardware problem. Acquiring a third radio and then testing it amongst the existing units will help to find out the broken unit.



Please contact your local vendor for advance technical support.
