**Azalea Networks**
Wireless Broadband
Anywhere Anytime

AZALEA  WIRELESS  MESH  ROUTER

MSR4000  INSTALLATION  GUIDE

May 2007
V2.0

Interconnection cable used inside this device is less than 140 feet.

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## Safety Warnings

MSR4000 must be installed by trained professional installation technician. All below warning information must be read before installation.

### General Safety Warnings

You can be killed or injured if performing antenna installation near electrical power lines. Carefully read and follow all instructions in this guide. Please be sure there are no high voltage and electronic field.

### Working aloft Warning

When work on tower or roof, the person on high place must wear safety belt, All the tools he take up must be tied to waist or shoulder. The people below must wear safety helmet.

### Lightning Activity Warning

Make sure not to connect or disconnect cables during periods of lightning activity.

A surge protective device should be installed to prevent potential damage from very high surges, for instance, the peak surges caused by lightning.

### Explosive Device Proximity Warning

Do not operate wireless network device close to explosive merchandise or environment, for example, a vicinity to a gas station.

### Antenna Placement Warning

Do not install any antenna near overhead power lines or other electric light, or where the antenna can come into contact with such circuits. When installing antennas,

take extreme care not to come into contact with such electrical circuits, as they can cause serious injury or death.

## Grounding Warning

Please always remember to protect your MSR4000 system by installation of grounding lines. The ground connection must be complete before connecting power to the MSR4000 enclosure. The requirement of grounding is to make sure the resistance must be less than 5 ohm between the ground termination point to grounding tier.

## Power Installation Warning

The installation of power switch must be performed by a trained professional technician.

The power switch is not supplied with the MSR4000. The power cord must be assembled by a professional installer, and the final assembly must comply with related requirements.

## Solar Irradiation and high Temperature Protection

Please pay attention of sunlight which will make the working temperature of MSR4000 higher then the specification

MR4000 would be located under sunlight. The solar shield which provided in Azalea standard package should be installed to outdoor MSR4000. The Azalea Warrantee policy does not cover those outdoor products which Solar shield is not installed for it. Please contact Azalea technical support engineers for detail information.

## RF Device Protection

Before powering up MSR4000, RF port must be connected to valid load, powering up with unloaded RF port is not allowed. Improper operation with power can cause damage of RF module. Azalea will not take any responsibility for such damage.

**FCC**

⚠ changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## REMINDING

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause   harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

## NOTICE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

## Precautions

The radiated output power of this device is below the FCC radio frequency exposure limits based on that human proximity to the antenna shall not be less than 34cm during normal operation.

## IC notice

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

**INDEX**

# 1   MSR4000 Quick Installation Guide

This Quick Installation Guide provides step by step instructions for installing and setting up the MSR4000. Content includes methods to access the MSR4000. For configuration, please refer to manuals in the attached CD ROM.

## 1.1   Further Reading

More detailed configuration instructions can be found in the CD-ROM.

## 1.2   Before You Begin

Open the shipping box and carefully unpack its contents. The packing list is as shown below. Please ensure all items are present and undamaged. If any of the items is found missing or damaged, please contact your local Azalea representative as soon as possible.

## 1.3   Package Contents

| ITEM | QUANTITY |
|---|---|
| MSR4000 | 1 |
| Solar Shield | 1 |
| Installation Bracket | 1 |
| Power Cable (free) | 1 |
| Screws and nuts | 13 |
| Quick Installation Guide | 1 |
| Manual CD | 1 |
| Certification | 1 |
| RMA | 1 |

# 2 Abstract

## 2.1 Function Introduction

MSR 4000 is a multi-functional wireless mesh router, which can be connected with end user equipment directly or other MSR routers and wire networks to set up wireless network. The basic functions are listed below:

- Can work as a Wi-Fi AP, can servie end user equipment, such as notebook, PDA and Wi-Fi phone

- Can work with other MSR4000 to setup backbone mesh network.

- Can be connected to wire network via its own ethernet port

- Intelligent radio frequency management, automatic network routing and smart end user administration and roaming

When the functions above are combined and configured properly, a wireless network based on MSR series routers can provide its users within coverage

- the connectivity to internet and any other user in the network

- multiple service, such as WWW, file sharing, VOIP, video stream.

- Seamless roaming in the wireless network

## 2.2 Appearance and Interfaces
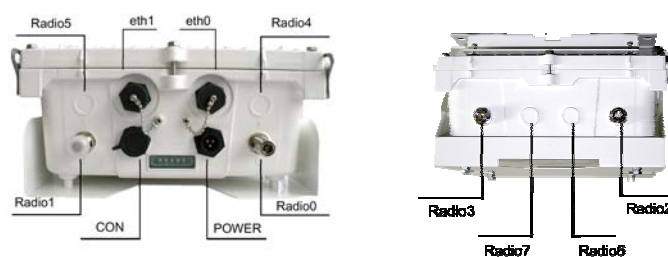


Ports of MSR4000 includes

- Four RF ports: R0, R1,R2,R3 (R4-R7 are sealed and reserved for future product)

- 2 Ethernet Cable Interfaces: Eth0, Eth1

- 1 Console Cable interface : CONsole

- 1 Power cable interface : Power

- 1 LED panel

## 2.3 Operating Range

| | |
|---|---|
| Operating Temperature Range | -40°C ~ +55°C |
| Storage Temperature Range | -40°C ~ +80°C |
| Non-Condensing Humidity Range | 10% ~ 90% |
| Wind Survivability Rating | 165mph |
| Power input (VAC) | 100/240 (50/60 Hz) |
| AC Power Consumption | 5W (typical) |

## 2.4 Environmental Rating

| | |
|---|---|
| Ingress Protection (IP) Ratings | 66 |
| Shock and Vibration Rating | ETSI 300-19-2-4 spec T41.E class 4M3 |

## 2.5 LED Panel



LED Panel

| | | |
|---|---|---|
| Eth0: | Green. | Blinking for data traffic on Eth0. |
| Eth1: | Green. | Blinking for data traffic on Eth1 |
| PWR: | Red. | On for Power On. |
| RDA: | Yellow. | Blinking for Radio0 is up . |
| RDB: | Yellow. | Blinking for Radio2 is up |

## 2.6 Ethernet Cable

Figure below shows one end of the Ethernet cable for connecting to the Ethernet port on the MSR4000, and the other end of the cable with a standard RJ45 jack. Between the two cable connectors in the diagram shows the pin arrangement

| Cable Color Mapping | Pin |
|---|---|
| White/green | Pin 1 |
| Green | Pin 7 |
| White/orange | Pin 5 |
| Orange | Pin 4 |
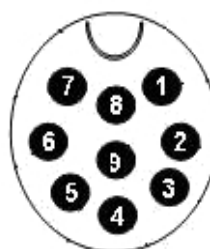
White/blue       Pin 2

Blue       Pin 3

White/brown       Pin 6

Brown       Pin 8

Ground       Pin 9

## 2.7 Console Cable

The weather insulated console cable plug and pin mapping are shown in the figure below. The other end of the console cable which connecting to the laptop is a standard DB9 connector.

Azalea adopts generally applied Ethernet cable to build the Console Cable.

**Circular side**

Orange       Pin1

White/Green       Pin2

White/Blue       Pin3

Other wires and pins left free
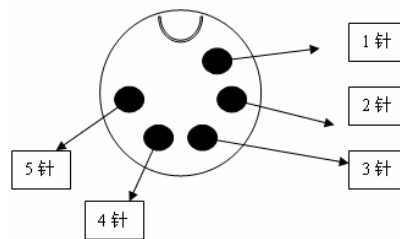


**DB9 side**

White/green       Pin 2

Orange       Pin 3
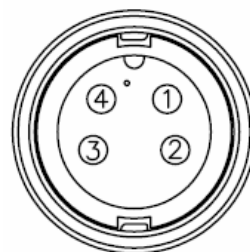
White/blue       Pin 5



Other wires and pins left free

## 2.8 Power Cable

● Circular connector

The black connector of power cable is shown in following figure, which has four pins

Connection guide for power cable:

Phase（Live Line） – $2^{nd}$ pin of 3 pin power cable with water protection

Neutral（Zero Line） – $3^{rd}$ pin of 3 pin power cable with water protection

Grounding– $1^{st}$ pin of 3 pin power cable with water protection

● Power Plug

The other side of power cable is a standard connection according to local regulation
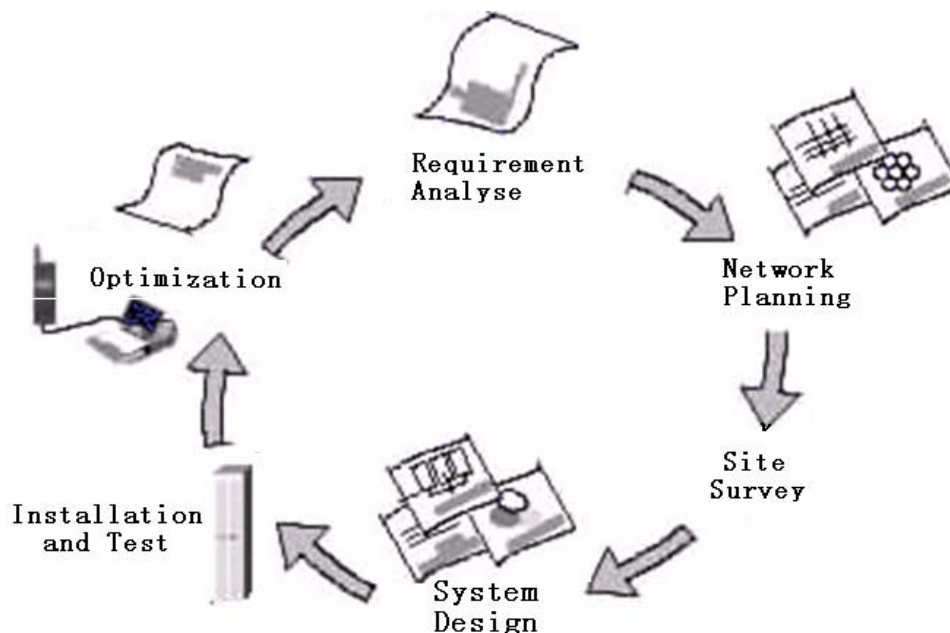
## 2.9 Screws



1. Sun Shade Assembly
2. Mounting Brackets Assembly
3. Holding the Chassis Box
4. Hanging the Chassis Box
5. Grounding

# 3   Installation Preparation

## 3.1   Site Survey

site surveyis is the key step in wireless network project, which is decisive to the reasonablity of system design and the smooth implementation of deployment.



## 3.2   Site survey tools

The site survey tools should be prepared and checked before departure, the tools include:

- Laptop
- GPS
- Compass
- Scale
- Digital camera   (recommended)
- Telescope (recommended)
- Spectrum Scanner（optional）



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## 3.3 The principle of site survey

1) The principles of site survey of MESH networks are as: Mesh No obstacle in 60% of the 1$^{st}$ fresnel zone. It will secure LOS in most areas and the coverage capability is secured and the number of sites could be saved.

2) If no LOS secured, area in NLOS area could be covered as well, but the distance of coverage and area of coverage are decreased, more sites are needed to provide coverage for same area than LOS scenario.

3) Interference must be considered in site selection. New site should avoid known interference,   unless the interference is controlable

## 3.4 Site Survey Guide

Site survey mainly include location selection and detail site study

### ● Site Selection

The site survey engineer should be experienced with good knowledge of microwave propagation, antenna ,feeder, MSR products and experiences in wireless network deployment.

Site location selection is the most important step of site survey. MESH network design engineer will do on site analysis of target area and recording all required site data, the site data includes terrain information, end-user distribution and their behavior, radio environment and the coverage target of MESH networks. Power availability, line access availability , permit of antenna installation are mandatory aspects to be considered in site survey. It is suggested to hunt more locations than actual needs that back-up sites can be used if the availability of some sites changed. Actual measuremet is suggested done for complex radio environment. The ideal site should meet following requirement:

- minimum obstacles to the target coverage area from the antenna.
- Availability of power
- Availability of Line access for Gateway
- Permit of antenna installation and MSR4000 mounting.

### ● Detailed site study

Site survey engineer should conduct detail measurements according to the plan, the measurements and records include site location information, antenna selection, MSR4000 mounting position etc. Site survey report is suugested to prepared after all site survey works finished.

- ➢ Eye measurement: building information, terrain information

  Eye measurement is to verify there are any obstacle and reflection in wave propagation environment and terrain informing, such as building, trees, etc.

- ➢ Spectrum measurement (optional): radio environment

Spectrum measurement is to get familiar with radio environment in the target coverage area and antennas. The interference could from Wi-Fi APs and other systems.

➢ Site investgation: the availabity of power, installation of antenna and MSR4000.

## 3.5  Tools

- Safety tape, safety cap
- Insulation tool
- Installation Tool
- Measurement Tool
- Power Panel
- Template of Installation

## 3.6  Security Check Before Start

- Check mast installation, the material of pole and its installation should comply related installation specification(Pole should be vertical, and grounding should be done, the diameter is around 40－60mm;
- Grounding is prepared already;
- Check the distance between MSR4000 and Grounding point;
- If cabling need to go through wall or ceiling;
- Special installation material or tools are needed or not.

## 3.7  Equipment Check

- Check the integration of equipment list in the package;
- Check the integration of antenna, feeders and installation packages;
- Check the preparation of Adhesive Tape, PVC tape and strap to be enough for installation;

# 4 Antenna Installation

## 4.1 Principles

● Height of antenna installation:

➢   The antennas height can be different even for antennas connected to same MSR4000. It would be determined by the space of installation, or by design requirement;

➢   The antenna height for access could be 20 meters in open and flat area of city. It could be 30 meters in open area in rural flat area;

➢   Too high antenna installation will decrease the coverage capability close to antenna, it is much popular when using omni antennas;

➢   Too high antenna installation will have another negative impact for system performance by interference to sites in surrounding areas. Its signal strength will be seen by many other sites, which is hard to avoid interference.

● Antenna azimuth:

➢   The main beam of antenna should point to the most dense traffic area to have better coverage and link quality;

➢   The overlapping coverage between two neighboring site should be less than 10% of its total coverage area in urban scenario;

➢   Overlapping area should not be too large in suburban and country area as well, and the angle of two neighboring antenna main beam should not be less than 90 degree;

➢   To avoid over coverage of an antenna, the antenna main beam should not point to the center of straight streets.

It should notice that the coverage capability changed if the azimuth of antenna adjusted, to improve coverage in one direction will give negative impact to other direction. The proper azimuth is very important in network building up stage.

● Antenna down-tilt angle desing:

➢   Down-tilt is widely used to have better coverage and less interference to neighboring sites;

➢   The down-tilt angle should be well designed, too high down-tilt will impact antenna beam form, and have the negative impact of coverage;

➢   The design of down-tilt antenna angle should consider the output power, antenna height, target coverage area, radio environment, etc. It should be done after site survey.

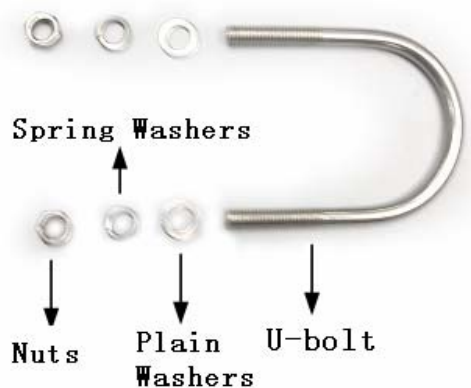## 4.2 Installation of directional antenna

● Assembling of installation accessories

Installation accessories of directional antenna includes:

- ✔ directional antenna
- ✔ Antenna up-bracket (length adjustable)
- ✔ Antenna down-bracket
- ✔ U-bolt
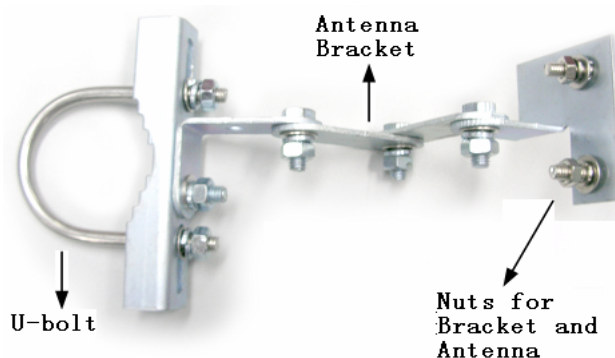- ✔ Nuts to connect antenna and bracket

Tools of antenna installation

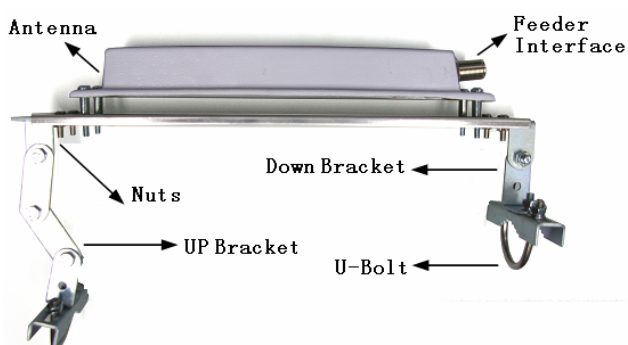- ✔ Screwdriver (crosspoint head)
- ✔ Spanners (size 8 and 10)

The procedure of antenna installation is:

- ✔ Install U-bolt to arc side of antenna bracket

- ✔ connect antenna and antenna bracket by tighting nuts

Please notic the adjustable bracket should installed in upper position, that are more felixible to adjust downtilt angles.

● Antenna Installation

Tools: Spanners size 10

1．The height of antenna must follow the requirement in desgin documentation ( enough isolation should be secured between antennas, vertical isolution is much better than horizental isolation);

2．Put antenna to pole by U-bolt, start from upper U-bolt then down one;

3．Fix antenna on bracket, don't strengthen the nut too tight because the antenna azimuth will be adjusted.



● Azimuth and Tilting Adjustment

Tools needed: Spanner, Compass, and Inclinometer.

Adjusting azimuth:

1. To measure the azimuth by compass;

2. Compare the difference between the actual azimuth with design value;

3. Slightly adjust azimuth to design value;

4. Measure the azimuth again to secure the difference less than 5 degree;

5. Fix the down U-bolt by screwdriver.



Adjusting down tilt angle:

6. Measure the down tilt angle by angle inclinometer;

7. Compare the difference between actual figure with design value;

8. Slightly adjust the downtilt angle by stretching or shrink the up-bracket.

9. Measure the down-tilt angle again to secure the difference between actual downtilt angle and actual one less than 0.5 degree;

10. Fasten nuts in upper bracket to complete the installation of directional antenna.

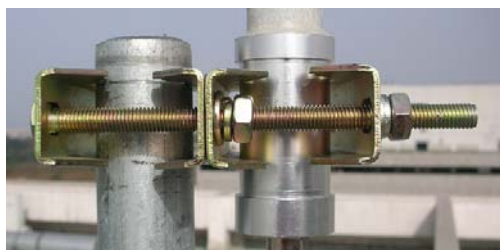## 4.3  Omni Antenna Installation

Tools:

Adjustable Spanner

Installation material package of omni a

- ✔ Omni antenna:
- ✔ Installation bracket of omni antenna( 2 sets of fasten nuts included)

The procedure of omni antenna installation is:

1． Mount the bracket to pole by one set of nuts, fasten the nuts by Spanner;

2． Mount the omni antenna to the bracket by another set of nuts;

3． Adjust antenna to secure it installed vertically;

4． Fasten the nuts by Spanner.

⚠️Safety protection must be guaranteed when aloft work

⚠️The installation should be done by experienced antenna installer. Power line and high electric field must be avoided.

⚠️Don't stand on side of antenna of MSR4000 when MSR4000 is operating, there are strong electromagnetic field surrounding the antenna

⚠️Don't do any installation works during raining time.

# 5 MSR4000 Installation

Installation kit

- ✔ 1 Solar shield
- ✔ 4 shield fastening bolts
- ✔ 1 Installation Bracket
- ✔ 2 pipe holders (mounted on pole)
- ✔ 4 long bolts for pipe holder
- ✔ 4 expansion bolts ( mounted on wall)
- ✔ 2 MSR4000 Fastening bolts

**Mounting Bracket**

**M4×16 screw (For hanging unit on mounting bracket**

**U type holder**

**Mounting screw**
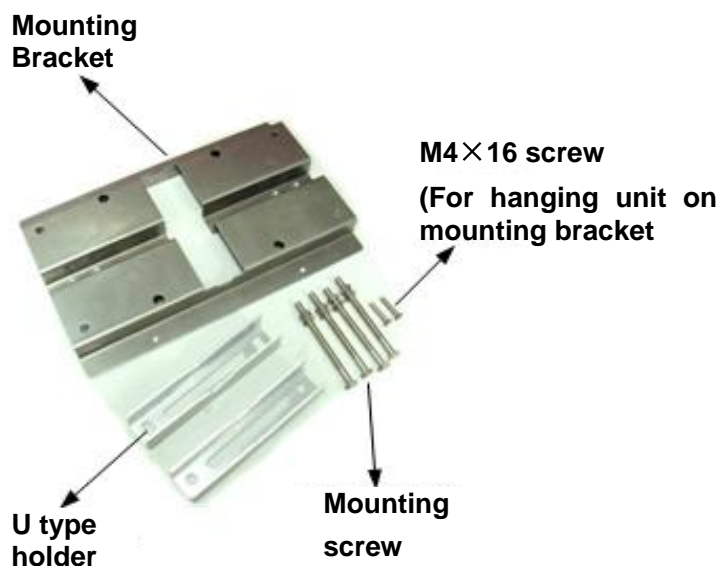
## 5.1 Install MSR4000 on Mast

Tools: Spanners size 10 and 14.

Installation Procedure

1. use long bolts to fasten the pipe holder and bracket to the mast

2. use 2 MSR4000 fastening bolts to mount the MSR box to the bracket

3. use the 4 shied bolts to mount solar shield to MSR400

And MSR4000 could also be mounted on horizon pole by mounting bracket equipped.
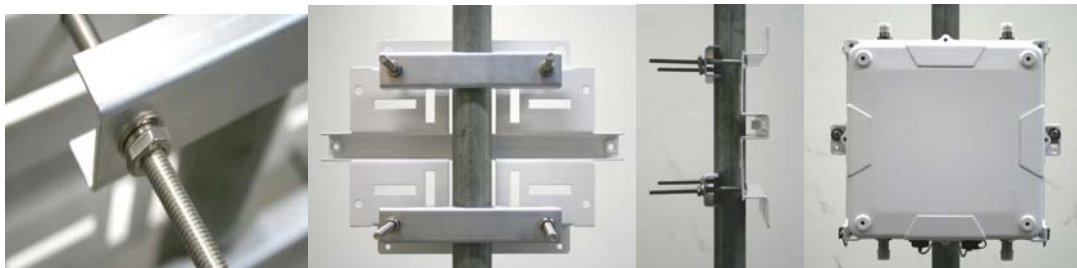
## 5.2 Mounting MSR onto wall

Tools needed: Mark pen, Percussion drill, Percussion Drill Hammer, and adjustable Spanner.

The process of installing MSR4000 on a wall is as:

1．Put the MSR4000 bracket against the wall and mark the 4 position of nut holes;

2．Drilling on the 4 mark positions;

3．Hit expansion bolts into wall;

4．Put MSR4000 bracket on the expansion bolts;

5．Use the 2 MSR fastening bolt to fix MSR onto the bracket

6．Use shield fastening bolts to install the solar shield onto MSR4000



## 5.3   Grounding of MSR4000

The grounding of MSR4000 is to protect MSR4000 from electrostatic damage, there is grounding terminal on the enclosure of MSR4000.

Tools needed: Paper knife, Pliers, Crimping Pliers, and Cross Screwdriver.

The procedure of grounding is as:

1．Put naked side of grounding wire into the copper ring, and press it firmly by Crimping Pliers;

2．Unmount the screw of in the grounding terminal.

3．Put the copper ring into the grounding terminal.

4．Fasten the screw by Cross Screwdriver;

5．Connect the other side of grounding wire with grounding bar;

6．  Daub butter on both side of grounding wire

 Never skip grounding in the MSR4000 installation, and it must be finished before powering up MSR4000.The residence of grounding wire must be less than 5 ohm.

## 5.4   Assembling Solar Shield

Secure screws through the holes on the corner of shield to MSR4000.
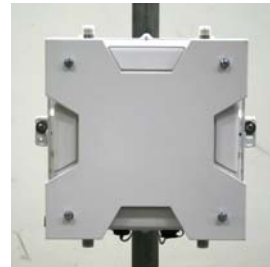
# 6  Lightning Protection Installation

The lightning protector is to protect MSR4000 to avoid damage by burst high current from lightning. Lightning protector should be installed between radio port and antenna feeder, and the lightning protector should be connected with lightning system of the building .

Tools needed: Paper knife, Pliers, Crimping Pliers, Cross Screwdriver, and Spanners.

The procedure of lightning protector:

1．Connect the lightning protector to radio port of MSR4000;

2．Fasten the lightning protector by Spanner;

3．Unpack the copper ring of grounding.

4．Put the naked side of grounding wire into copper ring and pressed firmly by Crimping Pliers;

5．Connect the grounding copper ring with lightning protector and fasten it by Cross Screwdriver;

6．Connect the another side of grounding wire with grounding bar;

7．Daub butter on both side of grounding wire:



**Lightning Protector**

# 7  Feeder Installation

Feeder is used to connect antenna with MSR4000. Due to the high propagation loss for high frequency waves , the feeder must be as short as possible to get minimum loss of signal strength. If long feeder must to be used, higher diameter feeder is recommended.
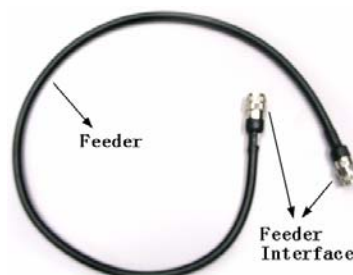


The typical propagation loss of 100 meters is listed in the table below:

| Feeder type | Cable loss for 2.4GHz (dB/100m) | Cable loss for 5.8GHz (dB/dB/100m) |
|---|---|---|
| 1/2" | 12.8 | 21.4 |
| 7D | 25.7 | 42.6 |

Tools needed for feeder installation: adjustable Spanner, paper knife, Diagonal Pliers.

The procedure of feeder installation:

1   Connect feeder to antenna port. Fasten the connection by turning the feeder connector clockwise slowly;

2   Further tighten the connector with spanner;

3   Cabling the feeder following the pole, and be careful of the arrangement of cabling, and without any sharp band of the cable.

The radius of cable bend should less than following figures of different types

| Cable type | Cable Bending Radius (mm) |
|---|---|
| 1/2" | 125 |
| 7D | 60 |

4   connect to the other side to lightning protector;

5   Secure the feeder on pole by black sheaf rope and don't hang the feeder in the air;

6   Airproof the connectors by insulating tape and PVC insulating tape.

# 8 Ethernet Cable Installation

Ethernet cable connects MSR4000 mesh network to wire network. Ethernet cable is needed, only when MSR4000 used as gateway. The performance of network cable will degrade seriously with length longer than 100 meters. So in MSR nodes planning, it is better to choose access point to wire network within 100 meters.

The process of Ethernet cable installation

1. Unscrew the protective cap on the Ethernet enclosure.
2. plug Ethernet cable RJ45 head to MSR4000 Ethernet interface.
3. Water proof the connection by wiring insulation Adhesive Tape and PVC insulation type;

# 9 Power Cord Installation

MSR4000 use 110-220V AC as power, the power inter MSR4000. Power cable should be the last step of installa

Tools: Diagonal Pliers，paper knife

The procedure of power cable installation:

1. Point the female power plug to MSR4000 power port
2. lug the power cable firmly to the port, further tighten the connection by turning the coupling ring, (which is already attached to the plug) clockwise;
3. Water proof the connection by wiring insulation Adhesive Tape and PVC insulation type;
4. Secure the power cable follow to the pole with strap, but don't make it too tight
5. The other side of power cable plug use normal 3 male pin connection to power supply.

⚠️Installation of power cable must be done by experienced technician. Please read the installation manual carefully before installation.

⚠️Before finally power up MSR4000, make sure grounding is done correctly

# 10   Completed Installation

Picture of site with completed installation:

# 11 Administrating the MSR4000

There are two methods of performing the quick start configuration: using the Quick Setup Wizard provided by MSR series' Web-based Management Interface (WMI), or using the setup command of the router's Command Line Interface (CLI). Azalea recommends using the Quick Setup Wizard which is accessible from most modern internet browsers such as Internet Explorer. The Quick Setup Wizard simplifies the initial configuration of the router into answering a few simple questions.

## 11.1 Sample Network

**Figure 1** shows the topology of a typical network formed by the MSR series:
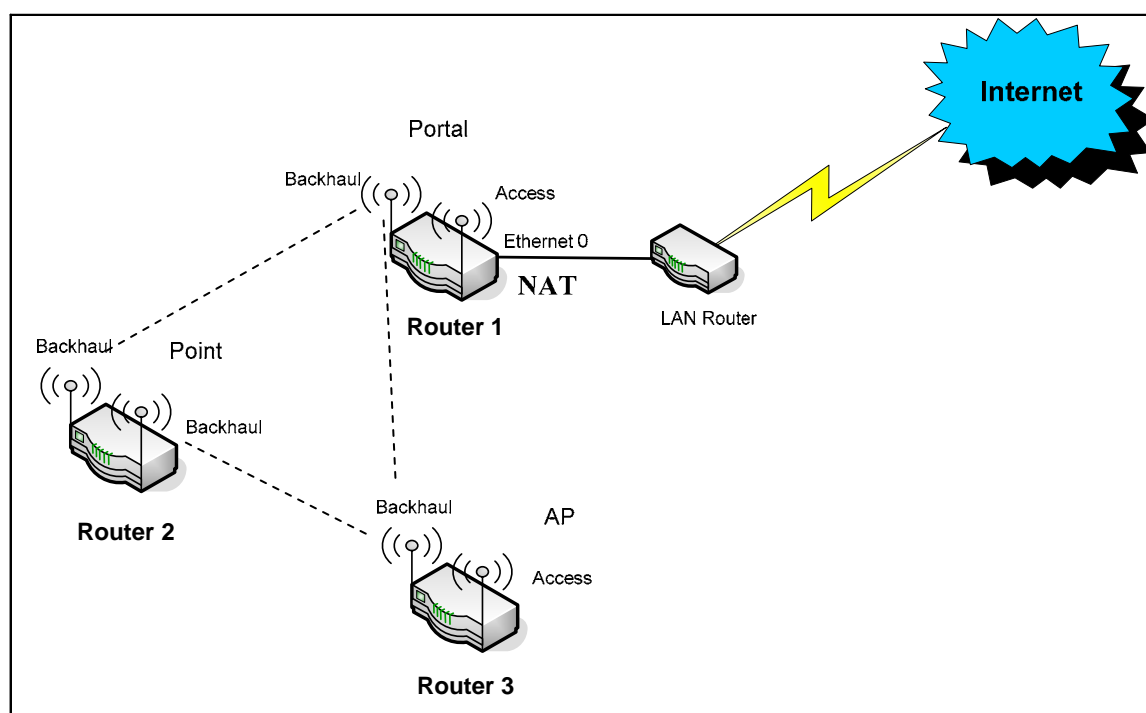


**Figure 1** Sample MSR series Mesh Network

This network contains three MSR series routers (or nodes, as referred to hereon). Node 1 is referred to as a *portal node* because it has a direct, wired connection to the internet.   It also contains two wireless connections formed by its two 802.11a/b/g radios.   The first radio is configured in access mode, which means it services as one or more virtual access points (AP) for end-user devices that might be around this node.   In this example, the SSID for the virtual AP is "Public" and any client device that uses this SSID is connected to node 1.   The other radio forms backhaul connections to the two other MSR series nodes, node 2 and node 3. The backhaul connections allow node 1 to send and receive network traffic to and

from these other nodes, giving these other nodes an indirect connection to the internet.[1]

Unlike node 1, node 2 does not serve any client devices but only forwards traffic to and from other nodes.   As such, both of its radios are configured in backhaul mode. Such a relay-only node is known as a *point node*.

Node 3 is similar to node 1 in that it has one backhaul radio and one access radio, which means it is also capable of connecting to other MSR series routers and servicing client devices.   However because it is not directly connected to a wired network, it is called an *AP node*.

### Configuration Summary

Table 1 summarizes the basic configuration settings required for each of the three nodes:

**Table 1** Node configuration summary

| Name and Type | MSR4000_1 (Portal) | MSR4000_2 (Point) | MSR4000_3 (AP) |
|---|---|---|---|
| Node ID[2] | 1 | 2 | 3 |
| Router ID[3] | 192.168.10.1 | 192.168.10.2 | 192.168.10.3 |
| Ethernet-port IP/Mask[4] | 206.10.5.2/24 | 192.168.1.2/24 | 192.168.1.3/24 |
| Ethernet Gateway[5] | 206.10.5.1 | N/A | N/A |
| SSID for AP[6] | Public | Not set | Public |
| DNS servers[7] | 206.10.10.12, 206.10.10.13 | Not set | 206.10.10.12, 206.10.10.13 |
| Roaming (Motrix)[8] | Enabled | Disabled | Enabled |
| NAT[9] | Enabled | Disabled | Disabled |

---

[1] The portal node presented in this quick start guide presents only one of many possible configurations of a portal node.   The only requirement for a portal node is a wired connection; its may or may not have an access radio or provide virtual AP service.   Please refer to the Configuration Guide for information on how to configure portal nodes differently.

[2] Node ID can be any integer 1 and 255, and must be unique within a single mesh network.

[3] Router ID is an IPv4 loopback address that identifies the router, and is usually the best way to connect to the administration functions of an operational router; must be unique within a single mesh network.

[4] This is the IP address and netmask of the Ethernet port 0 on the MSR series.   Depending on the exact model, there may be one or two Ethernet ports.   This quick start guide only uses Ethernet port 0.

[5] This is the IP address of the gateway router that the Ethernet port 0 is connected to.

[6] SSID is the alphanumeric identifier of a wireless AP which clients use to connect.

[7] DNS server information is needed for the clients to connect to the internet; this information is passed to the client when the client uses the DHCP protocol to obtain an IP address from the AP on the MSR series.

[8] Motrix-roaming is a service provided by the MSR series that allows wireless clients to move from the coverage area of one AP to another without experiencing any disruption in service. For details, refer to the Configuration Guide.
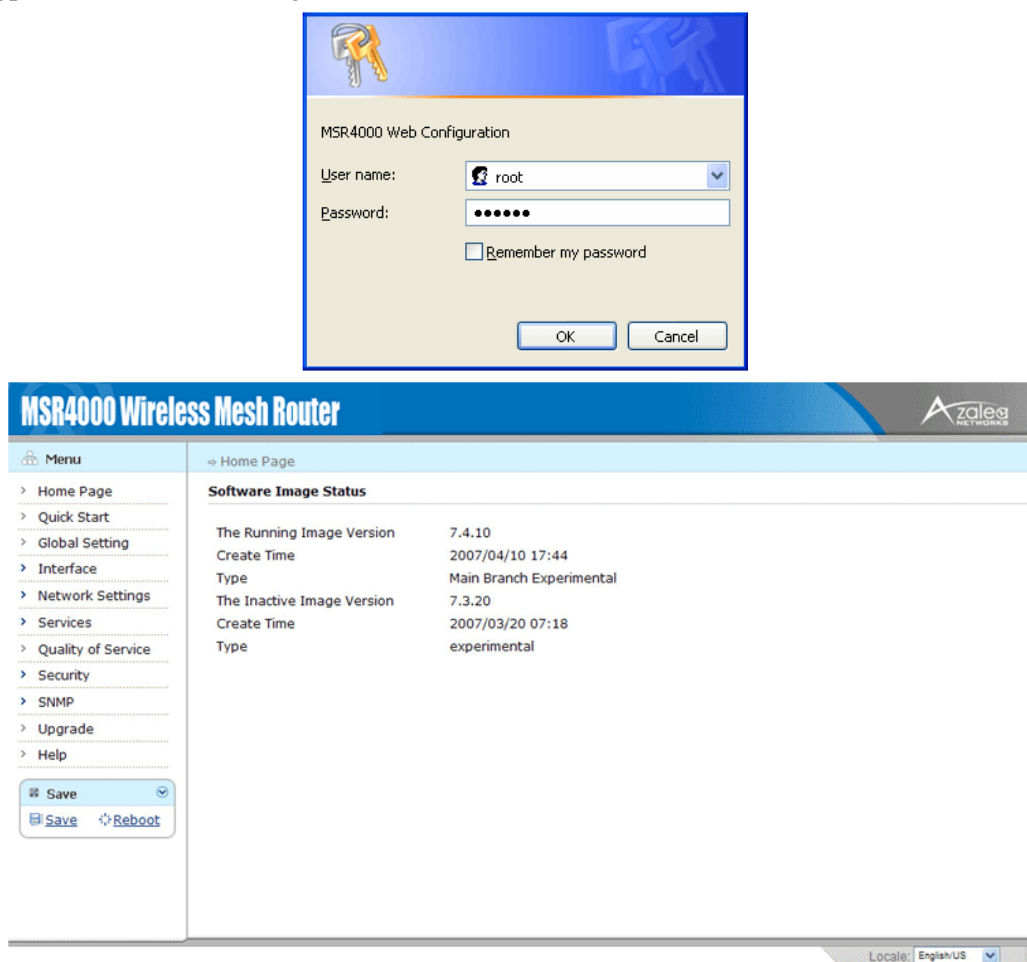
## 11.2 Configuring nodes with the Quick Setup Wizard

The basic software requirement for the web-interface is:

- Web Browser：   Internet Explorer 5.5 and above with Javascript enabled
- Optimal Resolution：1024 X 768 and above

### Accessing the Quick Setup Wizard

To access the WMI's Quick Setup Wizard, input the IP address of that router and the port: 9080 in the address field of your web browser. On an un-configured MSR series router, you can connect a client PC to the router's Ethernet 0 port and use the port's default IP address of 192.168.0.1 to connect. A pop-up dialog box would appear and request a username and password (see **Error! Reference source not found.**) The default username is 'root' and password is 'public'.   After the successful authentication, the home page for WMI would appear as shown in next figure





To open the Quick Setup Wizard, click the "Quick Setup" link in the left-side menu tree. The Step 1 of the Quick Setup Wizard appears at the right side of the web page (see Figure 2)

**Figure 2** Web Management Interface Home Page

**Using the Quick Setup Wizard**

To configure a node with the Quick Setup Wizard, answer the questions asked during each step of the wizard.   After entering the answers for all the questions at one step, click the "Next" button to go to the next step.   The "Back" button could be used to return to the previous step, and clicking the "Finish" button at the end of the wizard completes the configuration.

**Example Configuration 1:   Portal node**

The following figures show how the example portal node can be configured by answering the questions on each screen.



**Figure 3** Configuring the portal node, step 1

⇨ Quick Setup Wizard

**Step 2: Networking Settings**

**Router ID**

Please specify a loopback IP address for this router, it should be unique within the IP network

192.168.10.1     IPv4 Address

**IP Address/Netmask**

Please specify the IP address and Netmask for the FastEthernet 0 port of this router

◉ Static IP Address/Mask
206.10.5.2/24     Type:A.B.C.D/M
○ Use DHCP to obtain the IP Address

**Gateway**

Please specify the IP address of the gateway that the FastEthernet 0 port is connected to

206.10.5.1     Type:A.B.C.D

**NAT**

Please choose whether NAT should be enabled on the FastEthernet 0 port

◉ Enable   ○ Disable

Back   Next

**Figure 4** Configuring the portal node, step 2
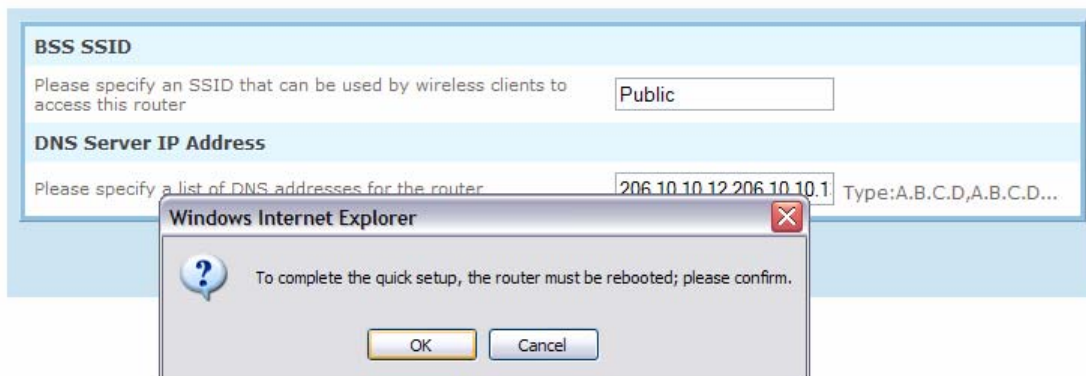
⇨ Quick Setup Wizard

**Step 3: Wireless Settings**

**BSS SSID**

Please specify an SSID that can be used by wireless clients to access this router

Public

**DNS Server IP Address**

Please specify a list of DNS addresses for the router

206.10.10.12,206.10.10.1   Type:A.B.C.D,A.B.C.D...

Back   Finish

**Figure 5** Configuring the portal node, step 3
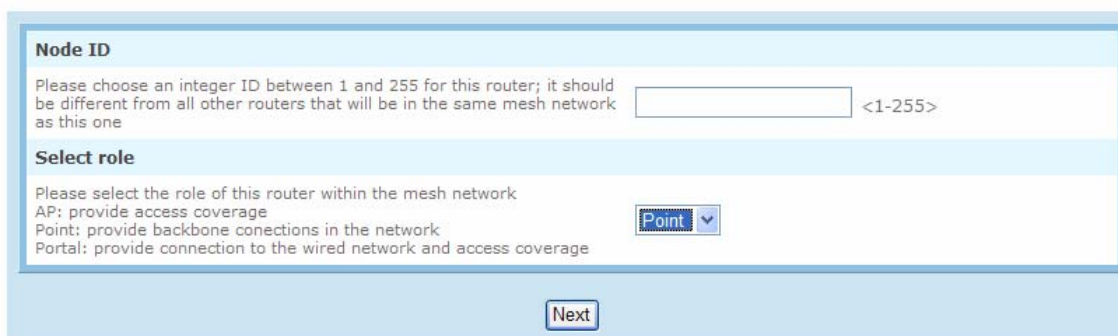
⇨ Quick Setup Wizard

**Step 3: Wireless Settings**

**BSS SSID**

Please specify an SSID that can be used by wireless clients to access this router

Public

**DNS Server IP Address**

Please specify a list of DNS addresses for the router

206.10.10.12 206.10.10.1  Type:A.B.C.D,A.B.C.D...

**Windows Internet Explorer**

To complete the quick setup, the router must be rebooted; please confirm.

OK    Cancel

**Figure 6** Configuring the portal node, step 4

After the last step of confirming the reboot is performed, the web interface would stop responding for a few seconds while the router reboots itself. Note that since the quick setup changes the IP address of the Ethernet 0 port on the router, you may need to re-open the web interface using the new IP address if you were using Ethernet 0 to connect to the router.

**Example Configuration 2:   Point node**

The following figures show how the example point node can be configured by answering the questions on each screen.

⇨ Quick Start Wizard

**Step 1: Basic Settings**

**Node ID**

Please choose an integer ID between 1 and 255 for this router; it should be different from all other routers that will be in the same mesh network as this one

<1-255>

**Select role**

Please select the role of this router within the mesh network
AP: provide access coverage
Point: provide backbone conections in the network
Portal: provide connection to the wired network and access coverage

Point ▾

Next

**Figure 7** Configuring the point node, step 1

**Figure 8** Configuring the point node, step 2



**Figure 9** Configuring the point node, step 3

**Example Configuration 3: AP node**

The following figures show how the example AP node can be configured by answering the questions on each screen.

**Figure 10** Configuring the AP node, step 1



**Figure 11** Configuring the AP node, step 2



**Figure 12** Configuring the AP node, step 3

*Note: The scope of this document does not cover tuning the mesh network for total coverage. For more detailed configuration instructions, please refer to the respective guides available in the CD-ROM.*

# Appendix

- MSR4000 basic specifications

  - 802.11a/b/g
  - Quad radio
  - Antenna changeable
  - Power range: 100 ~ 240 VAC 50/60Hz
  - Power consumption: 10W
  - Output power: 100mw(20dBm) 400mw(26dBm, b/g)
  - Operating temperature: ﹣40 ~ +55℃
  - Storage temperature: ﹣40 ~ +80℃
  - Operating humidity:  10%~90% non condensing
  - Wind Survivability: <165mph
  - Weather rating: IP 66 Weather tight

- MSR4000 physical information

  - Length: 325mm
  - Width: 290mm
  - Height: 135mm
  - Weight: 7kg (w/o mounting bracket and solar shield)
  - Chassis material : Aluminum
  - Chassis color : white