Azalea Networks

Wireless broadband anytime and anywhere

MST200

High Performance Multi-Service Terminal Device

Quick Installation Guide

V1.0

www.azaleanet.com

Statement of Conditions

In the interest of improving internal design, operation function, and/or reliability, Azalea Networks reserves the right to make changes to products described in this document without notice.
Azalea Networks does not assume any liability that may occur due to the use or application of the product(s) described herein.

DISCLAIMER: LIMITATION OF LIABILITY

1. Before installation, it's strongly recommended and requested that users shall pay particular attention to the safety warnings in the sequent detailed operation procedures within the manual. If there's any uncertainty or incapability of solving problems, it's necessary and reasonable to timely contact the company's customer support center. Please DO NOT take any risk or try to verify situations by yourself. Otherwise, any consequence caused by the attempt shall be completely due to the user himself.

2. Please periodically check whether the installed MST200 is damaged, worn-out or in danger. Any actual proof, sign or phenomenon of the mentioned situations shall be notified to the company or point of sale in time. Please DO NOT attempt to repair the product or replace any component. Otherwise, for any consequence arising out of or relating to the users' attempt, including but not limited to damages, disuse, short circuit, fire attack, bodily injury, etc., the company shall not be liable.

3. Users shall purchase or use the company's MST200 completely voluntarily. Users shall understand on their own initiative and abide voluntarily by policies, regulations or laws of the nation or local territories. The consequence arising out of or relating to any violation of the local laws or regulations by the users shall be solely imputed to the user himself, and the company shall not be liable for that.

4. The company disclaims any and all warranties and guarantees, express, implied or otherwise, arising, with respect to the MST200 products or services, including but not limited to the warranty of merchantability, the warranty of fitness for a particular purpose, and any warranty of non-infringement of the intellectual property rights of any third party. Liability of the company for loss is limited to the total amount paid to the company by customer during the previous calendar year. The company will have no obligation or liability, whether arising in contract (including Warranty), tort (including active, passive or imputed negligence, strict liability or product liability) or otherwise for any special,

incidental, consequential or indirect damages including but not limited to loss of use, loss of data, business interruption, loss of revenue, loss of business or other financial loss arising out of or in connection with any of the products or other goods or service furnished by the company under this manual, even if advised of the possibility of such damages.

5. It shall never be understood that the manual expresses or implies to any customer or any third party authorize or transfer any rights. The company reserves fully the final interpretation of the MST200 and this manual.

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.

Safety Warnings

MST200 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 MST200 system by installation of grounding lines. The ground connection must be complete before connecting power to the MST200 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 MST200. The power cord must be assembled by a professional installer, and the final assembly must comply with related requirements.

RF Device Protection

 Before powering up MST200, 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.

Contents

1 About This Manual

This Quick Installation Guide provides step by step instructions for installing and setting up the MST200. Content includes methods to access the MST200. 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
MST200	1
Installation Base and bracket	1
Power Cable (free)	1
Screws and nuts	1 set
Quick Installation Guide	1
Manual CD	1
Certification	1
RMA	1

2 Overview

2.1 Function Introduction

The Azalea Multi-Service Terminal 200 (MST200) is the high performance multi-service terminal device specifically designed for wireless video surveillance. It is the first dedicated device for wireless video surveillance in the industry. This device delivers unprecedented stability and reliability for long distance wireless transmission of high resolution video streams.

- Network Video Delivery Technologies
- Video-Optimized QoS Technology
- Optimized for Long Distance Transmission

The MST200 offers rapid, seamless roaming and handoff thus delivering high quality video streams. The MST200 also provides advanced functions such as user configuration and remote software upgrades.

2.2 Appearance and Interfaces

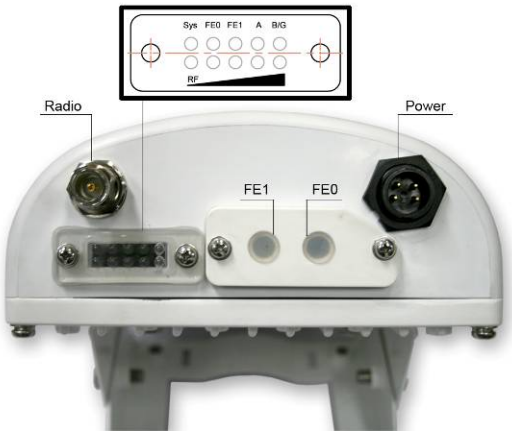

Figure 1 MST200 Interfaces

MST200 includes

- 1 RF ports
- 2 Ethernet Cable Interfaces: FE0, FE1
- 1 Console Cable interface : CONsole
- 1 Power cable interface : Power
- 1 LED panel

2.3 Operating Range

Operating Temperature Range	-40℃－55℃
Storage Temperature Range	-40℃－80℃
Non-Condensing Humidity Range	10%－90%
Power input (VAC)	100－240 (50/60 Hz)
AC Power Consumption	9W (typical)

2.4 Environmental Rating

Shock and Vibration Rating	ETSI 300-19-2-4 spec T41.E class 4M3

2.5 Ethernet Cable

Figure below shows one end of the Ethernet cable for connecting to the Ethernet port on the MST200, 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

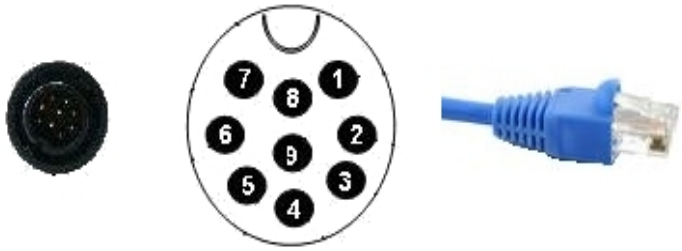

Figure 2 End of the Ethernet Cable

2.6 Power Cable

- Circular connector

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

Figure 3 Black Connector of Power Cable

Connection guide for power cable:

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

Neutral（Zero Line） – 3rd pin of 3 pin power cable with water protection

Grounding– 1st 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

2.7 Screws

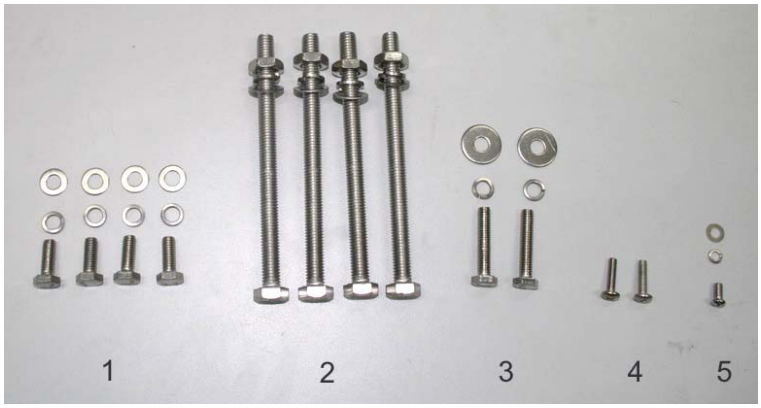

Figure 4 Screws and Nuts

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.

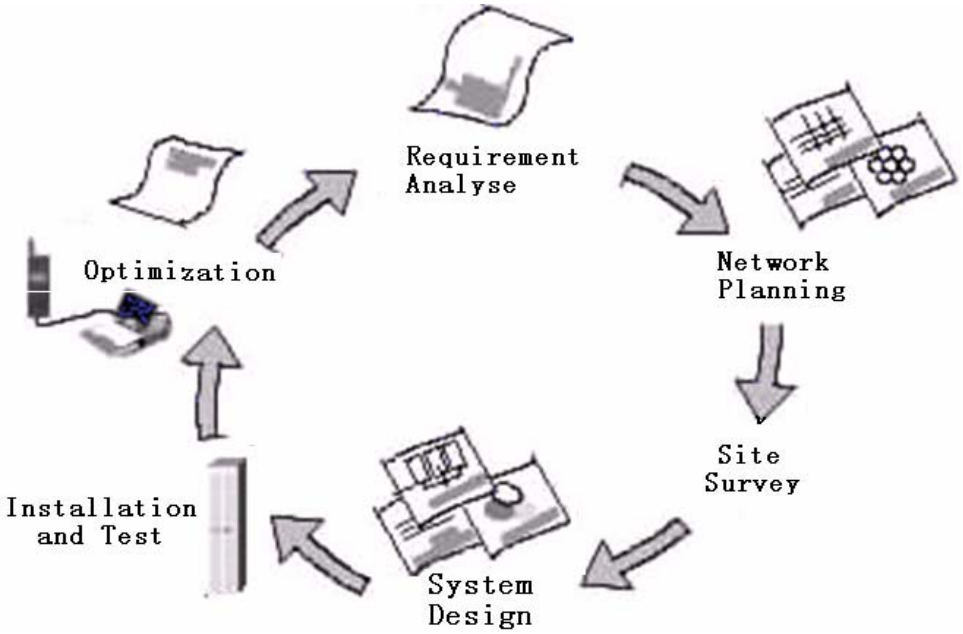

Figure 5 Site Survey

3.2 Site Survey Tools

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

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

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 1st 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 detailed site study

3.4.1 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 MST200 mounting.

3.4.2 Detailed site study

Site survey engineer should conduct detail measurements according to the plan, the measurements and records include site location information, antenna selection, MST200 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 MST200.

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 MST200 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

MST200 uses two types of antennas: built-in antenna and external antenna.

The built-in antenna has already been installed inside the plastic enclosure at the front of MST200. The built-in antenna works at the same frequency band as the corresponding MST200 and is configured to the factory setting (See figure below).

Figure 6 MST200 Front Side

The external antenna port is remained at the bottom of MST200 for users to freely choose gain or types of antennas. If users choose the external antenna port in software configuration, the antenna must be connected in advance or effective load.

Figure 7 MST200 Bottom Side

When installing MST200 (details refer to Chapter 5), the MST200 should, according to the network design, face the direction where the antenna of MSR routers points to. Unless the elevation needs to be adjusted, usually the MST200 is in horizontal position.

According to the LEDs that indicate the wireless signal strength, users can adjust the horizontal degree of MST200. Since the distance between MSR routers and MST200 is usually quite long, the extent of each adjustment should keep small, not exceeding 5 degrees. After adjustment, users should wait a few seconds, and observe the change on LED to get the maximum signal strength.

Due to the impact of wireless environment, LEDs for signal strength may not all turn on when the received wireless signal is highest. In addition, due to the impact of wireless environment, the LED indication may change while the degree of antenna remains the same. Therefore users should wait a few seconds before starting the next adjustment.

Note: When fastening the installation components, make sure the previous selected degree of built-in antenna of MST200 not changed.

5 MST200 Installation

Installation procedure for MST200 on mast

1. Use suitable bolts to fasten the chassis onto the back of MST200 (See figures below).

Figure 8 Chassis, Suitable bolts and the Back Side of MST200

Figure 9 Chassis Installation Effect

2. Use suitable bolts to fasten the bracket onto the chassis (See figures below).

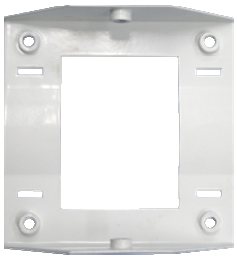

Figure 10 Bracket

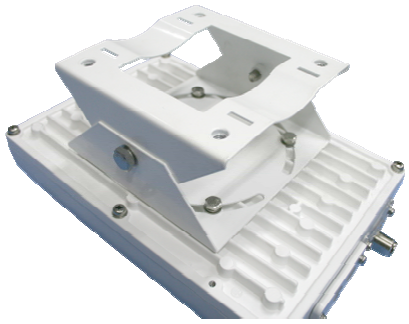

Figure 11 Bracket Installation Effect

Note: To adjust MST200 angle, one can adjust the angle of the bracket by using the fasten bolt as axis.

3. Use suitable bolts to fasten the bracket onto the mast (See figure below).

Figure 12 Bracket on the Mast

6 Grounding of MST200

The grounding of MST200 is to protect MST200 from electrostatic damage, there is grounding terminal on the enclosure of MST200.
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 MST200 installation, and it must be finished before powering up MST200.The residence of grounding wire must be less than 5 ohm.

Figure 13 Grounding of MST200

7 Ethernet Cable Installation

Ethernet cable connects MST200 mesh network to wire network. Ethernet cable is needed, only when MST200 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 MST200 Ethernet interface.
3. Water proof the connection by wiring insulation Adhesive Tape and PVC insulation type;

Figure 14 Plug Ethernet Cable Head to MST200 Ethernet Interface

Figure 15 Plug Ethernet Cable Installation

8 Power Cord Installation

MST200 use 100-240V AC as power, the power interface is on the left bottom of MST200. Power cable should be the last step of installation.
Tools: Diagonal Pliers，paper knife
The procedure of power cable installation:

1. Point the female power plug to MST200 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 MST200, make sure grounding is done correctly

9 Completed Installation

Figure 16 Complete Installation

Appendix

1. MST200 basic specifications

- Power range: 100 ~ 240 VAC 50/60Hz
- Power consumption: 9W (in typical circumstances)
- Operating temperature: -40℃ — 55℃
- Storage temperature: -40℃ — 80℃
- Operating humidity (non condensing): 10%—90%

2. MST200 physical information

- Dimensions: 255mm X 180mm X 82mm
- Weight: 7kg (not including mounting bracket and solar shield)
- Chassis color: off-white