KINGSAT
Maritime Antennas

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Quick Installation

Maritime Microwave Antenna System For Mesh Network M8

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Preparation for Installation

Check List

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1	Attention: Keep safe distance for radiation hazard.	Page 2	Done( )
2	Check if any obstructions exist with EL range -10°~115°.	Page 3	Done( )
3	Check mounting mast site .	Page 4	Done( )
4	Check physical solidness of mast.	Page 5	Done( )
5	Unpack carton and remove radome.	Page 9	Done( )
6	Check materials list in the carton.	Page 11	Done( )
7	Check connecting cables.	Page 12	Done( )
Part2 ACU and Modem (Below Deck Unit Preparation)			
8	Check ACU.	Page 13	Done( )

Preparation for Installation

Part-1 Antenna Installation Site (ADU Preparation)

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Step 1. Attention: When the antenna working especially transmitting signal, make sure 100% keep safe distance (**15m** far from ADU) for radiation hazard.

Safety Warning when antenna working

Preparation for Installation

Part-1 Antenna Installation Site (ADU Preparation)

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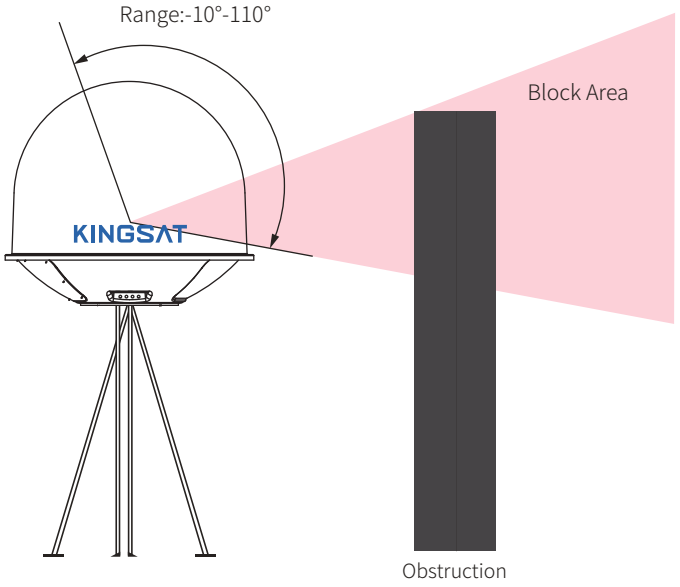
Step 2. Check if any obstructions exist with EL range -10°~110°.

Make sure antenna is free of obstructions ,it can transmit and receive the satellite signal fully.

The Optimized site is that 360° free of obstruction when pointing to sky.



Preparation for Installation

Part-1 Antenna Installation Site (ADU Preparation)

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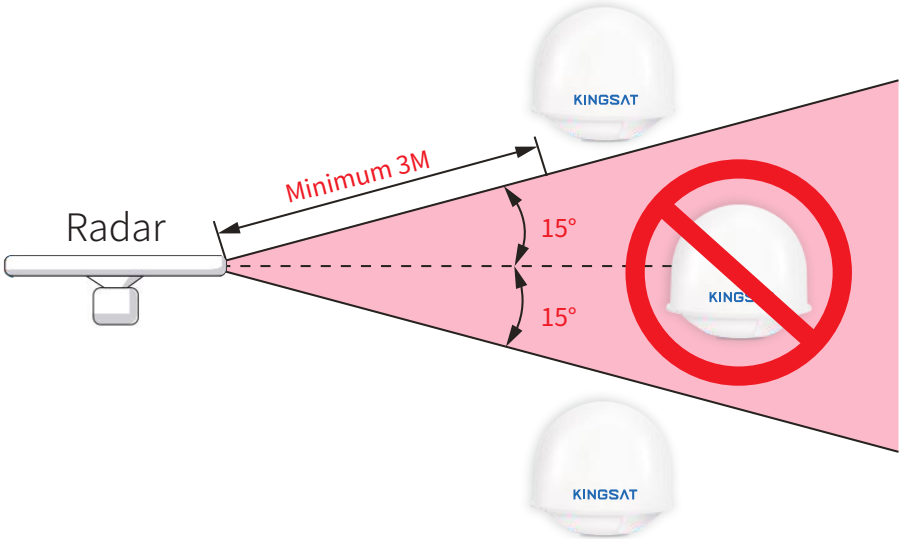
Step 3. Check mounting mast site. The optimized site has

(1)Minimum vibration (better far from engine)

(2)Keep safe distance to Radar or other RF transmitter (aviod fan beam **±15°**of Radar, keep distance to Radar **minimum 3m**).



Preparation for Installation

Part-1 Antenna Installation Site (ADU Preparation)

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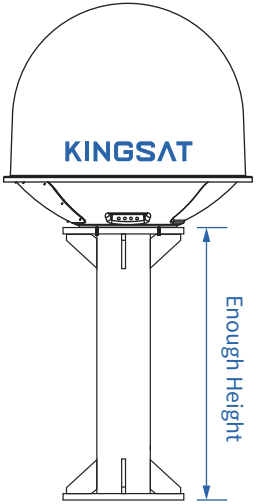
Step 4.Check physical solidness of mast.

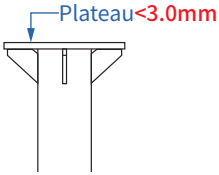
Make sure the mast has

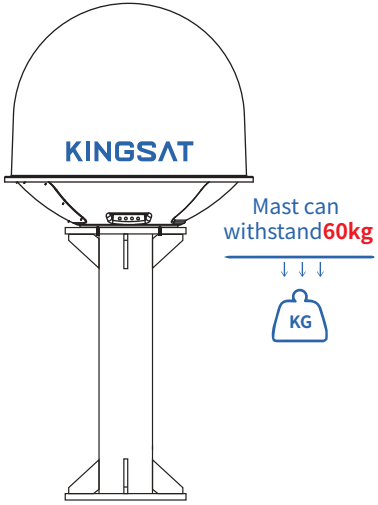
(1)Enough height ,must be free of obstructions.

(2)Good flatness, plateau is below **3.0 mm**.

(3)High solidness, it can withstand **60kg**.







Preparation for Installation

Part-1 Antenna Installation Site (ADU Preparation)

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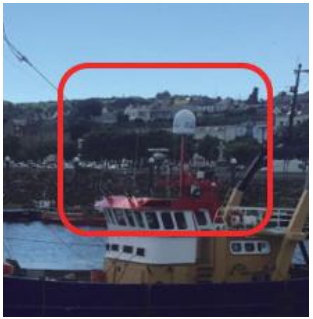
Installation Site Selection and Case Analysis

The following installation cases are the optimal sites.






Preparation for Installation

Part-1 Antenna Installation Site (ADU Preparation)

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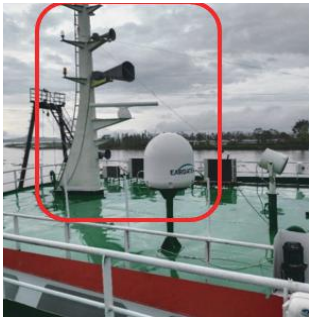
Installation Site Selection and Case Analysis

The following installation cases **are not the optimal sites and can be optimized.**



Too close to the mast, the antenna may be obstructed at mast direction.

Too close to the funnel, the radome is easy to get dust, then it will decrease RF performance of antenna.

Preparation for Installation

Part-1 Antenna Installation Site (ADU Preparation)

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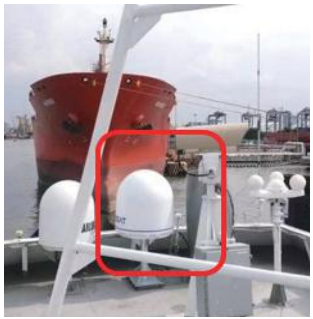
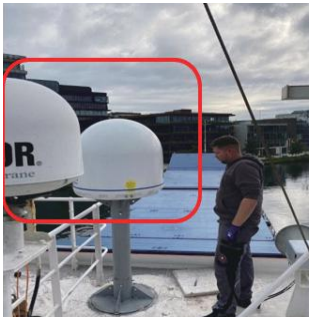
Installation Site Selection and Case Analysis

The following installation cases **are not the optimal sites and must be optimized.**





Too close to the mast, antenna can not get 360° free view to sky. **The site needs to be re-selected, must be far away from obstructions while the height of mounting bracket should be made as high as possible.**

Preparation for Installation

Part-1 Antenna Installation Site (ADU Preparation)

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Step 5.1 Unpack carton and take out the antenna.

Preparation for Installation

Part-1 Antenna Installation Site (ADU Preparation)

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Step 5.2 Remove radome. Then remove **ALL red fixing bolts** of safe delivery purpose.

M8 Fixing bolts position

Preparation for Installation

Part-1 Antenna Installation Site (ADU Preparation)

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Step 6. Check Material List in the carton.

物料清单					
序号	物料	数量	图片	工厂核对	用户核对
1	快速安装手册	1			
2	天线	1			
3	天线控制器	1			
4	15米同轴线(RG6)	2			
5	20米网线	1			
6	1米电源线	1			
7	N转F接头	2			
8	13毫米U型扳手	1			
9	M8六角螺母	4			
10	M8弹簧垫片	4			
11	M8平垫片	4			
12	M3*8圆头十字带合螺丝	4			
13	同轴线预备用接头	4			
14	U盘	1			
15	防水密封胶泥	1			
合计：		34	核对人		

Preparation for Installation

Part-1 Antenna Installation Site (ADU Preparation)

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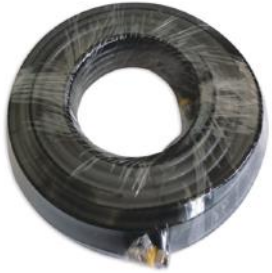
Step 7. Check connecting cables. We supply below accessories for each unit of antenna.

2 * 15 meter coaxial cable(RG6 black color)

1 * 20 meter network cable

2 * N-F type connecting converter

1 * 5 meter waterproof tape



RG6 coaxial cable

Network cable

N-F type connecting converter

Waterproof tape

Preparation for Installation

Part-2 ACU and Modem (BDU Preparation)

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Step 9. Check ACU. Check each port of rear panel connection.

Front Panel of ACU

USB port,for upgrading firmware of ACU and debug

Indicators, show antenna running status

256x64 OLED display, shows all status and setting of antenna

Buttons for ACU operation

ACU 后面板

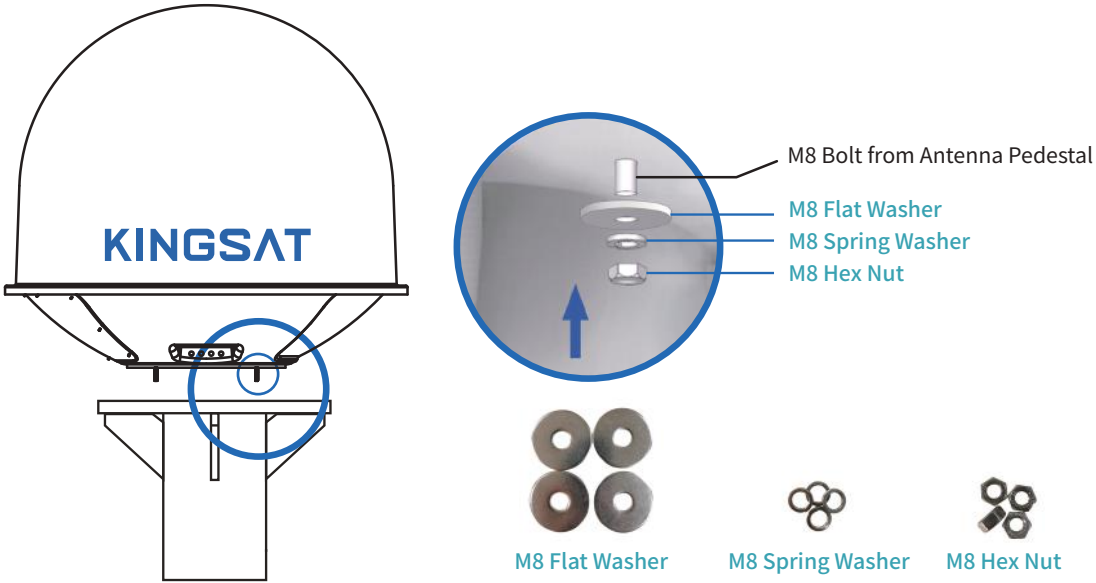
Connect to Antenna(ADU)

Ground Stud, must be well Grounding. For safety and ESD protection.

Installation

Step 1 Mounting antenna

Mounting antenna with below accessories on the pedestal of mast.



Installation

Step 2 Connection Diagram

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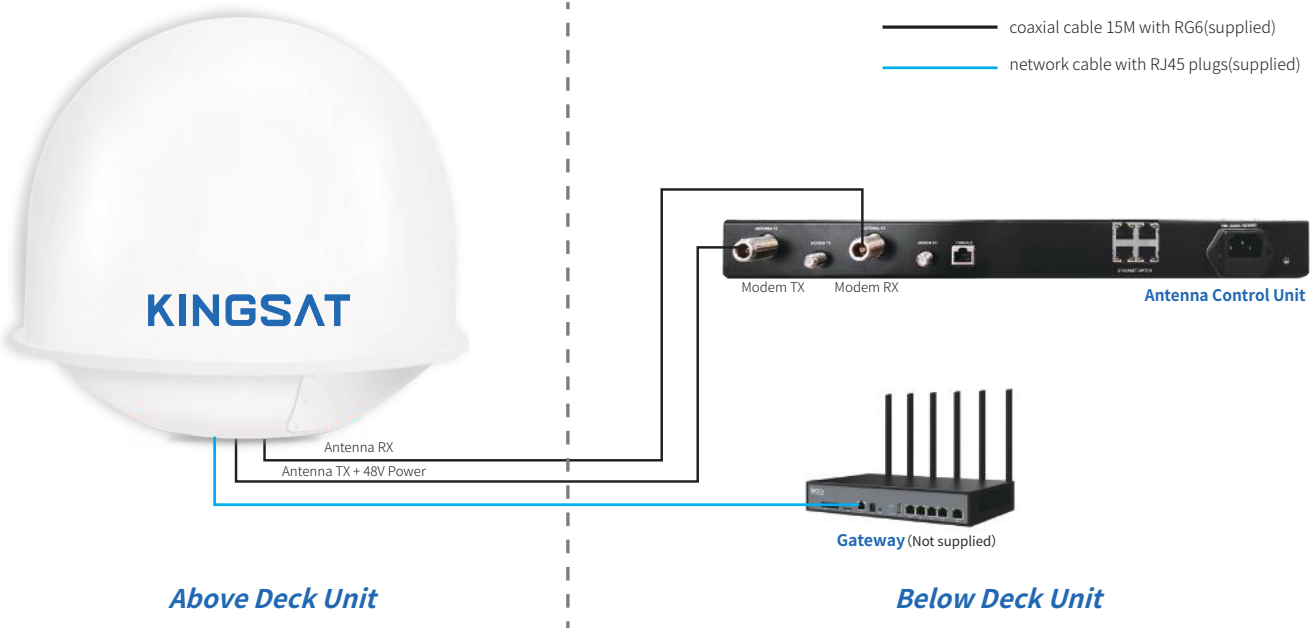
Prepare cables and make sure connections as below diagram.

Supplied cables

2 * 15 meter coaxial cable(RG6 black color)
1 * 20 meter network cable



Installation

Step 3 Confirm all connections

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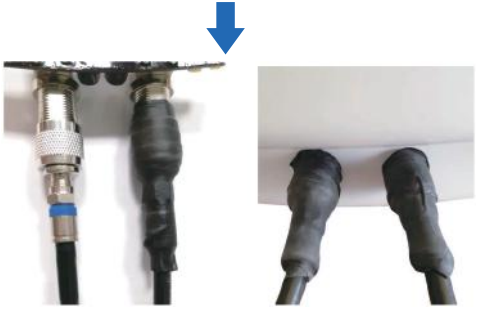
Review all connections.

Antenna connections

ACU connections



Connectors should be sealed with waterproof tape

Gateway connections

Installation

Step 4 ACU setting procedure

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Turn on power of the ACU. ACU starts to initialize.

▶ *Error may happen as below shows. This means ACU can not communicate with antenna correctly. Please check all cable connections(whether the TX and RX coaxial cables are connected wrongly, or whether the F-N RF heads are tight) and restart system.*

Installation

Step 5 Antenna Operating Status

After initialization, the antenna GPS module successfully obtains longitude and latitude, and the GPS icon appears as shown in the figure below.
At the same time, the MODEM communicates with the antenna controller ACU, and the OPENAMIP icon flashes.

This icon must appear, it means antenna can capture GPS signal correctly.

Installation

Step 6 Setting LAT and LNG

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The steps for setting the latitude and longitude of the fixed station on the ACU are as follows:

1. Press “OK” button, and enter the SETTING menu.
2. Select LAT, and press “OK” button to enter the latitude of the fixed station.
3. Select LNG, and press “OK” button to enter the longitude of the fixed station.
4. Select HGT, and press “OK” button to enter the altitude of the fixed station.
5. After setting the parameters, press “BACK” button and select “YES” to save.

Installation

Step 7 Fixed Station Locking

When the antenna lock the fixed station successfully, the parameter information and tracking status “TRACKING” will be shown on display. Now the microwave antenna is working correctly and tracking the fixed station as requirement.

Installation

Step 8 Testing Microwave Link

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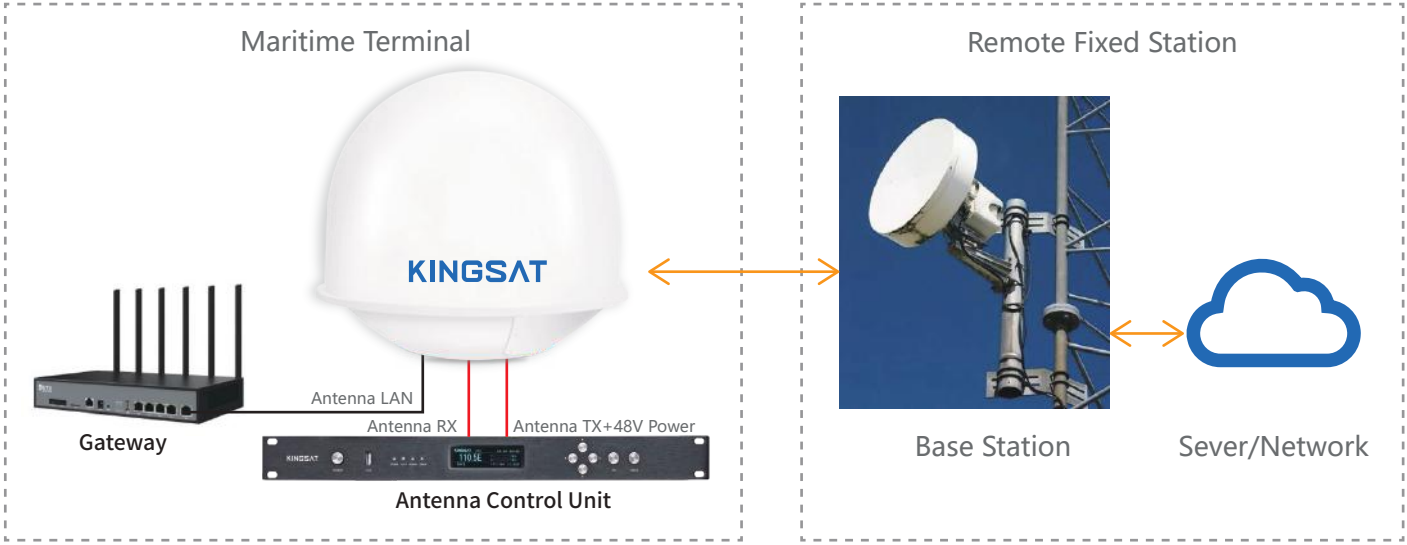
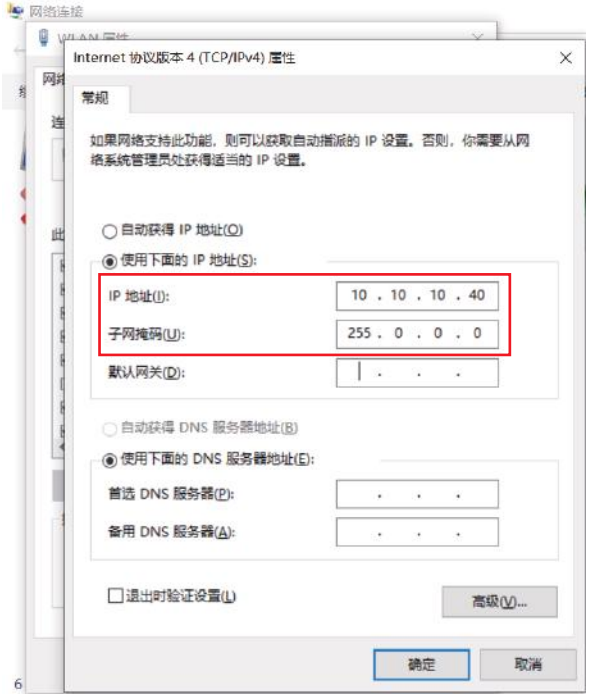
8.1 Use the 20m network cable to connect the antenna network port and the gateway.



Installation

Step 8 Testing Microwave Link

8.2 Connect PC to the gateway, and modify the IPv4 attributes to "**IP Address: 10.10.10.40, Subnet Mask: 255.0.0.0**", and finally click “OK” button to save.



Installation

Step 8 Testing Microwave Link

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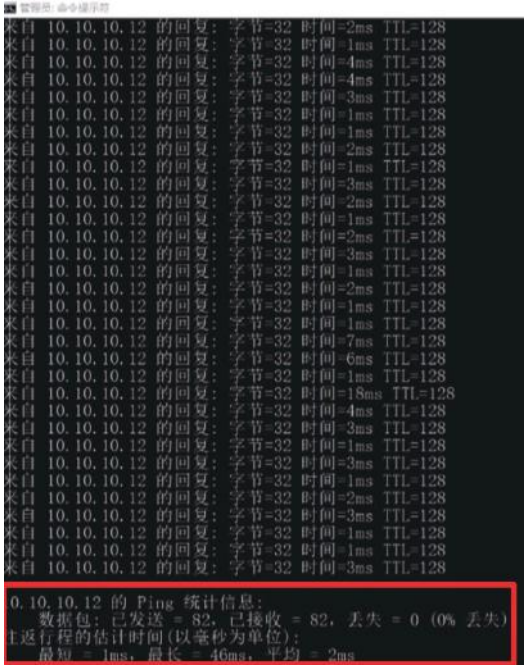
Open the CMD window and ping the IP address (such as 10.10.10.11) corresponding to the antenna communication mainboard. You can also access the remote fixed base station server to check whether the microwave mesh network is successful.



Appendix 1
ACU Operation Guide

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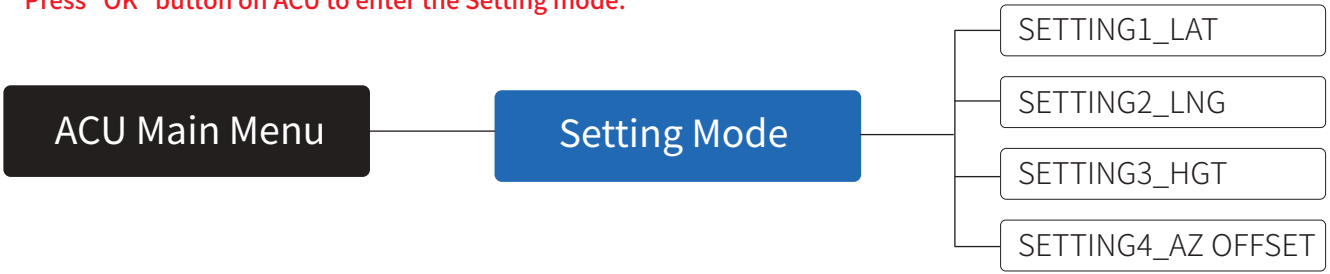
Press “OK” button on ACU to enter the Setting mode.



Appendix 1
ACU Operation Guide

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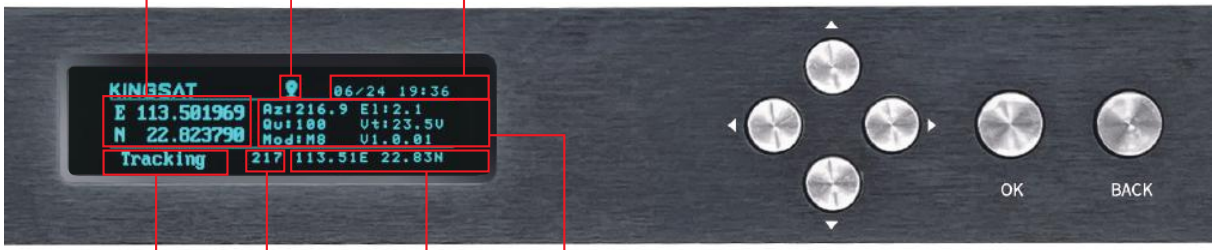
Main display description:



Appendix 1
ACU Operation Guide

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SETTING display description:

1 LAT: Set the latitude of fixed station.

2 LNG: Set the longitude of fixed station.

3 HGT: Set the height of fixed station.

4 AZ OFFSET: Set the azimuth offset angle when manually adjust the antenna to the fixed station

Appendix 2
Upgrade

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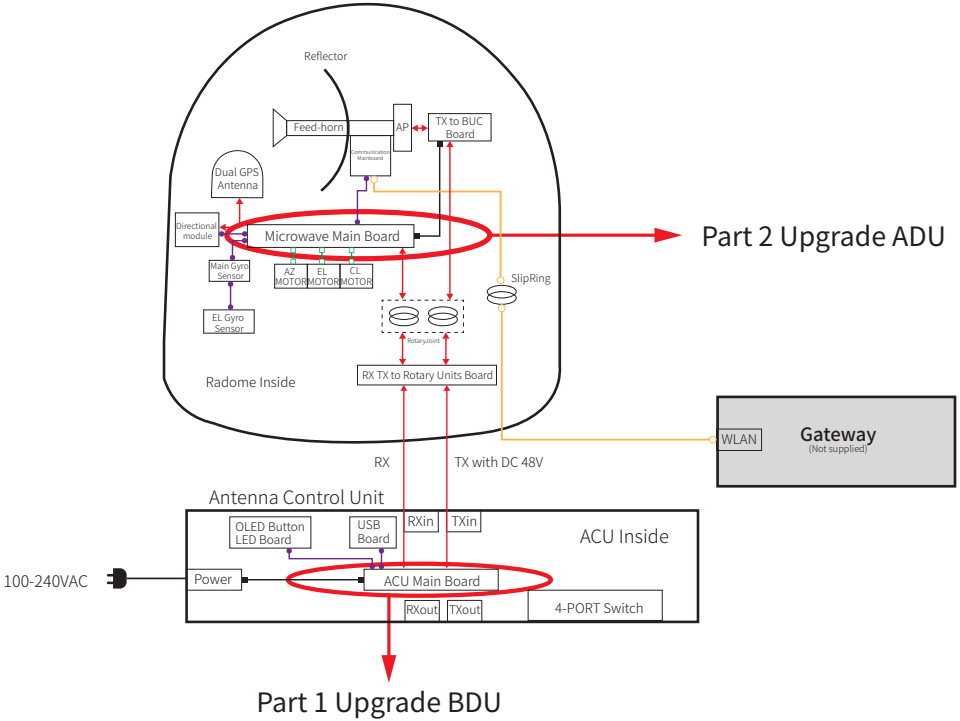

Appendix 2
Upgrade

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Part 1 Upgrade BDU

Normally latest version of ACU firmware is needed, plz follow below steps to upgrade it.
Step 1. Get the up-to-date firmware from KINGSAT or official distributor.
Step 2. Copy the firmware to USB flash disk and ensure it is at root directory;
Step 3. Power off ACU and insert USB to the port on ACU front panel;
Step 4. Press ”BACK” then press “Power”, don’ t release buttons until the display is lightened.
Step 5. Press “OK” and wait for upgrade(see below display);
Step 6. Done. System restart.

Appendix 2
Upgrade

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Part 2 Upgrade ADU

1.Download and install app ”RemoteWriter” on one Android phone from official distributor.

2.At Setup Mode, select<6. SET OTHERS> then turn on WIFI.

Appendix 2
Upgrade

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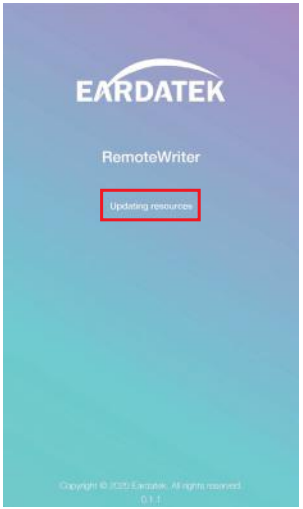
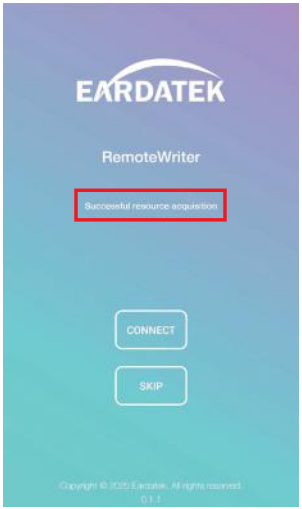
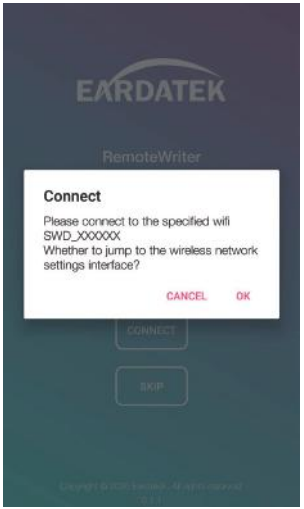
Part 2 Upgrade ADU

3. Open the Android phone application "Remote Writer", make sure there is a network connection (4G/wifi) , wait for a few seconds, from "Updating Resources" until "Successful Resource Acquisition" is displayed.The download of the latest firmware from the server is complete.
4. Click "Connect " to Device , it shows that wifi needs to be connected "SWD_XXXXXX", jump to the phone settings, connect to this wifi.







Appendix 2
Upgrade

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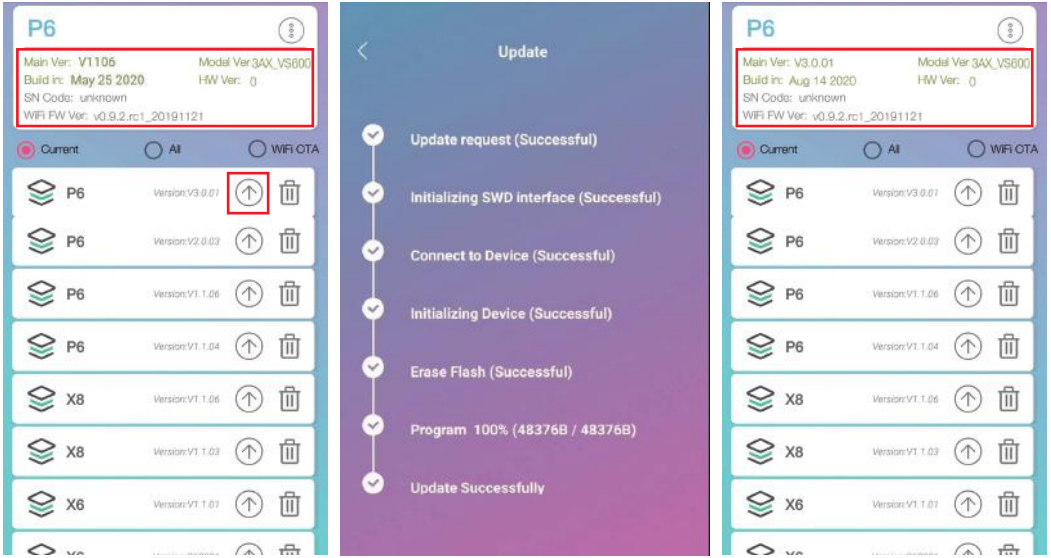
Part 2 Upgrade ADU

5. Return to the "Remote Writer" application, enter the firmware list, and confirm the firmware version of the current device.
6. Select the appropriate firmware version and click the up icon ⓘ to upgrade.
7. The upgrade is complete, and confirm whether the version is the selected upgrade version.



Appendix 3
Troubleshooting Guide

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Error Code and Solutions

E01. The initialization of antenna mainboard failed, please check connections of Tx and Rx cables and N-F connectors also check the antenna mainboard.

E02. The detection of antenna power failed, please check connections of Tx and Rx cables and N-F connectors.

E06. The detection of Gyro sensors failed, please check Gyro sensor and cable connection of sensors.

E07. The detection of EL motor failed, please check the limited sensor, Elevation motor and belt of the EL motor.

E08. The detection of AZ motor failed, please check the limited sensor, Azimuth motor and belt of the AZ motor.

E12. The detection of Cross Level motor failed, please check the limit sensor, Cross Level motor and belt of the Cross Level motor.

E90. The firmware of antenna mainboard may be damaged . Please contact the manufacturer to recovery the firmware.

The parts involved in the above error codes are shown in the figure below.

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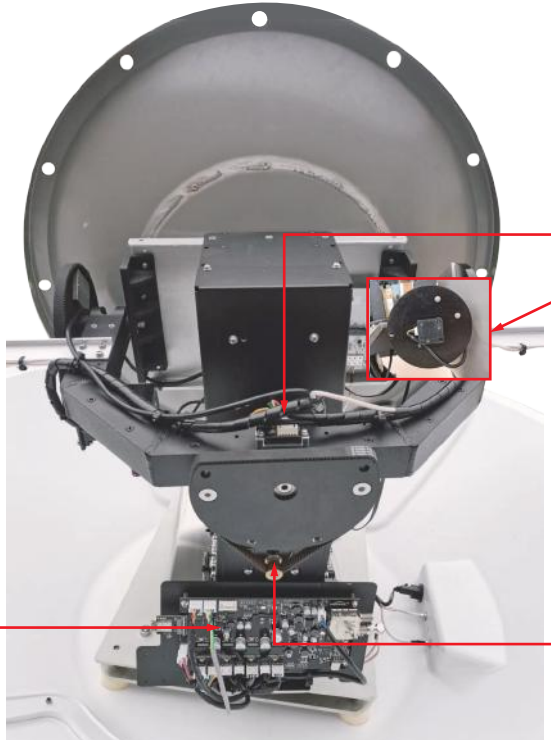

E06 Gyro sensor issue. Check if the connection of sensor is loose. If not, replace the gyro sensor.

E01 E02
Antenna mainboard issue. Mainboard may be damaged, should be recovery or replaced.

E12 Cross Level motor issue. Check if CL motor is stuck or belt of CL motor is broken.

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Troubleshooting Guide

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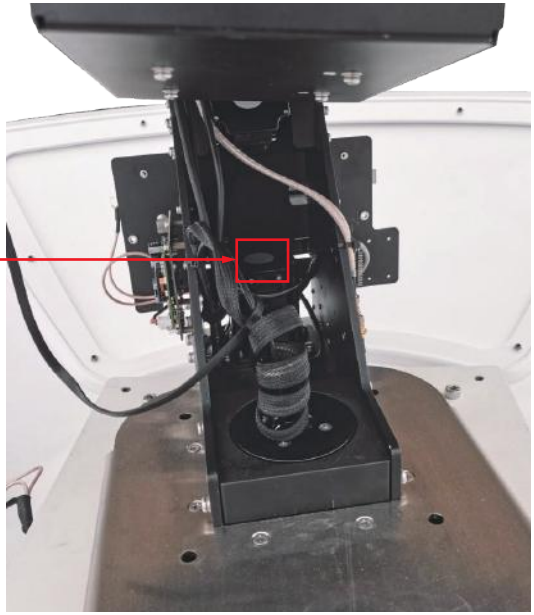
E08 Azimuth motor issue.
Check if AZ motor is stuck
or belt of AZ motor is broken.



E07 Elevation motor issue.
Check if EL motor is stuck
or belt of EL motor is broken.

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Troubleshooting Guide

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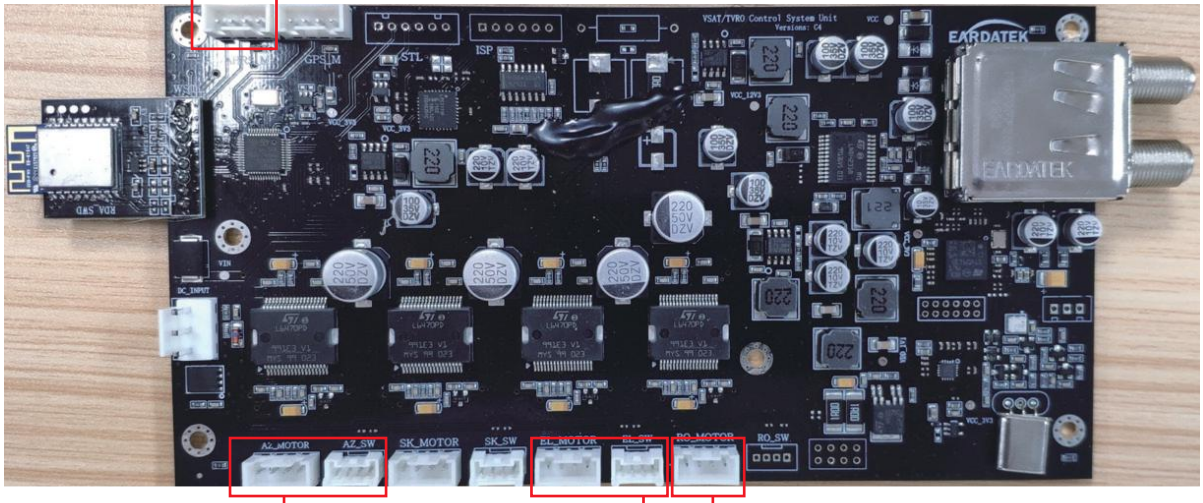
E06
Check if the connector of gyro sensor is loose.



E12
Check if cable of cross level motor and connector is loose.

E08
Check if cable of azimuth motor and limit sensor connectors are loose.

E07
Check if cable of elevation motor and limit sensor connectors are loose.

Appendix 3
Troubleshooting Guide

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Basic information confirmation

1. Confirm the antenna status displayed on the main page of the ACU, and make sure that the GPS icon and OPENAMIP icon appear correctly. At the same time, if the GPS module works properly, longitude and latitude and the time must be correct.

The GPS icon can be displayed to prove that the antenna GPS module is ok and to obtain longitude and latitude. Wait for five minutes, if it is not displayed, it is proved that there is obstacle of blocking signal or that the module is not working properly, check the connection of GPS module firstly (check connectors and GPS cable).

Appendix 3
Troubleshooting Guide

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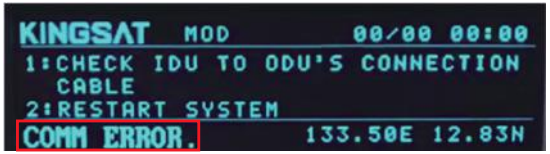
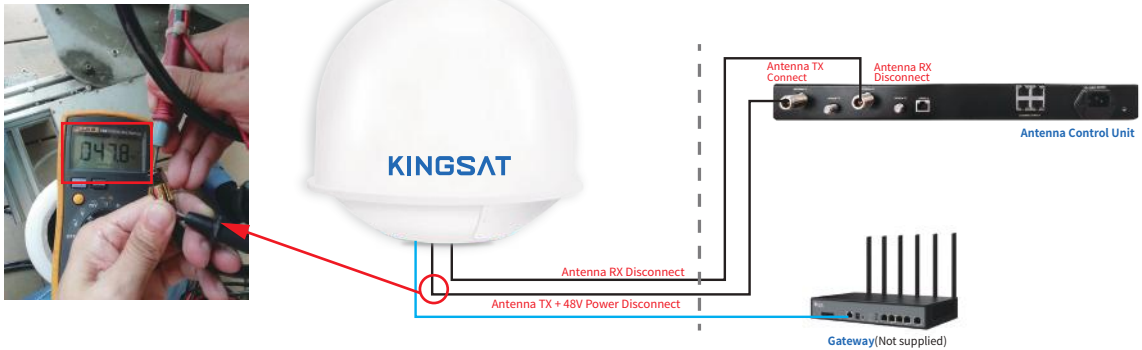
CASE 1.
The status keeps showing Init or COMM ERROR, what should I do?



First, it must be made sure that the antenna and ACU are properly connected according to page 15. If the connectors are correct, here are the steps.
a. Disconnect the coaxial cables between the antenna and ACU, and check RX and TX coaxial cables connections with the buzzer of multimeter. If RX and TX coaxial cables are broken, contact the manufacturer to replace.
b. Connect TX coaxial cable to the ACU, keep TX coaxial cable and antenna disconnected, and turn on the ACU power. Use the multimeter to measure TX coaxial cable near to the antenna, and the normal voltage reading is about 48V. If the 48V voltage is abnormal, check the ACU mainboard. If the 48V voltage is normal, connect TX coaxial cable with the antenna.



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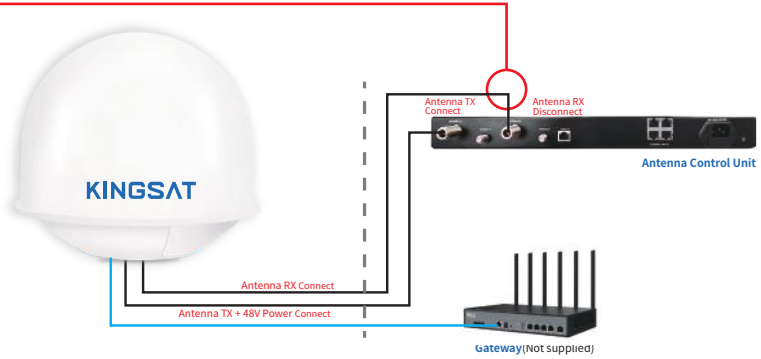
c. Connect RX coaxial cable to the antenna, keep RX coaxial cable and ACU disconnected, and use the multimeter to measure RX coaxial cable near to the ACU. The normal voltage reading is about 5V. If the 5V voltage is abnormal, check the ACU mainboard.



d. If the voltages of Tx and Rx coaxial cable are normal, but the status still shows Init or COMM ERROR, check the ACU mainboard or the antenna mainboard. Mainboard issues need to contact the manufacturer with help.

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Troubleshooting Guide

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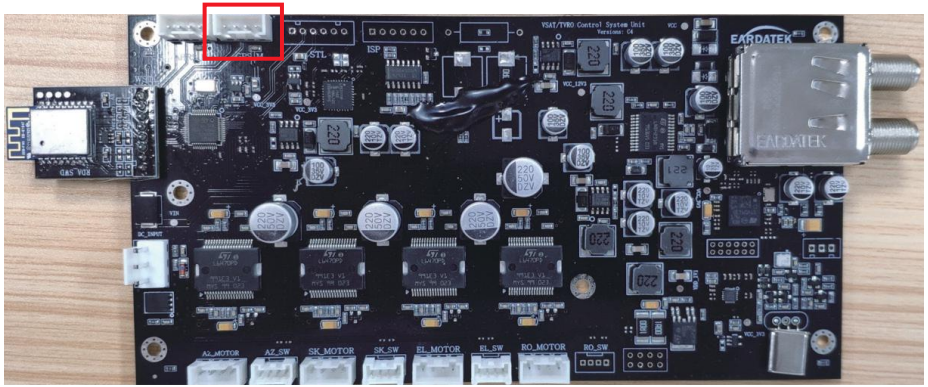
CASE 3.
The status keeps showing Heading, what should I do?

First, check if the GPS connector of the antenna mainboard is loose.



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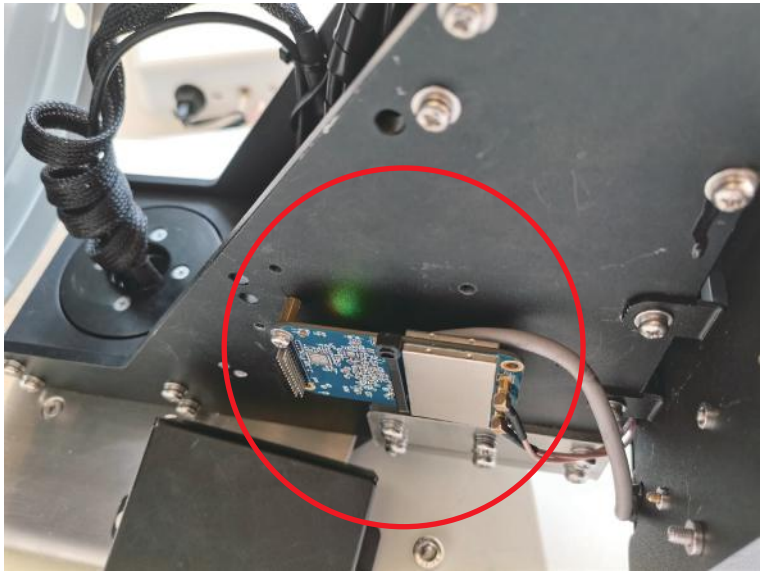
Case 3.
The status keeps showing Heading, what should I do?

Next, check if the indicator light of the GPS module lights up. If not, the GPS mainboard may be faulty. Need to contact the manufacturer with help.



Appendix 3
Troubleshooting Guide

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Case 3.
The status keeps showing Heading, what should I do?

Finally, remove the two GPS antennas, and use the multimeter to measure the antenna RF interface. The normal voltage reading is about 5V. If the 5V voltage is abnormal, replace the coaxial cable of the GPS antenna.

If the problem cannot be corrected, please contact the manufacturer with help.

Appendix 4
Block Diagram Inside Radome

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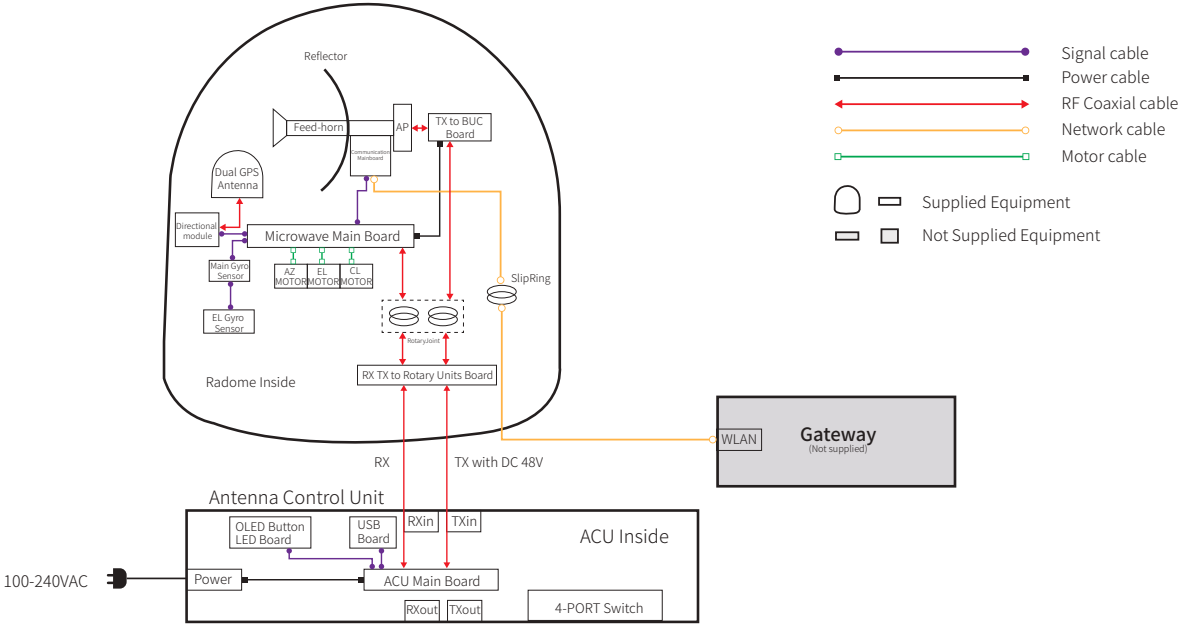

Appendix 5
Radome Dimension

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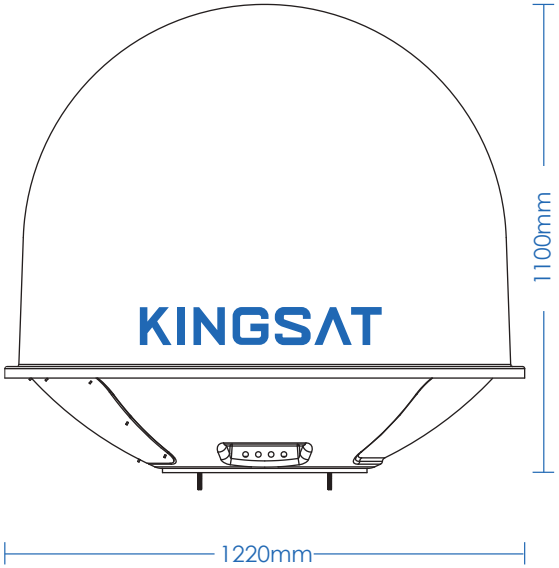

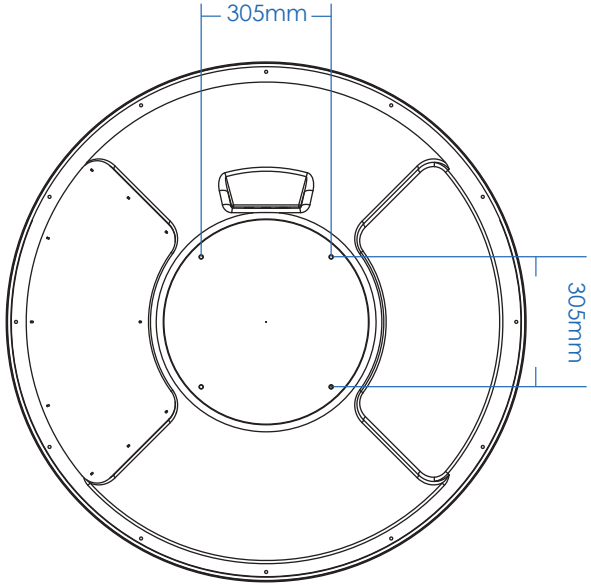

Appendix 6
Specification-M8

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Mechanical Specification	
Dish Diameter:	60 cm(23")
Weight:	50KG(110lbs)
Radom Size:	122 X 110 cm (48" X 43")
Radom Material:	ASA
Antenna Stabilization	
Operating Platform:	3-Axis
Azimuth Range:	0° to 690°/Unlimited
Elevation Range:	-5° to 115°
Cross Level Range:	± 35°
Position Acquisition:	Builtin GNSS (GPS/Glonass/Galileo/Beidou)
Ship Motion Support:	Roll: ± 25° @8~12 sec
	Pitch: ± 15° @6~12 sec
	Yaw: ± 8° @15~20 sec
Tracking Accuracy:	Automatic tracking level ⩽ 1.0dB (R.M.S)
Working Environment	
Operating Temperature:	-30° ~ 70°C
Storage Temperature:	-30° ~ 85°C
Humidity:	Up to 100% @ 40°C
Wind Speed:	60m/sec max from any direction
Water Proof:	IP56

Operating Specification	
Frequency:	4.9 ~ 6.5GHz
Gain:	30dBi
Horizontal beam width:	(H) 5.5°; (V) 5.5°
Vertical beam width:	(H) 5.5°; (V) 5.5°
VSWR:	⩽1.8
POL:	Cross-pol only
Input impedance:	50Ω
Front-to-rear ratio:	32dB
MAX power:	100W
Antenna Control Unit	
Dimensions (WxDxH):	48.2 X 30 X 4.5 cm
Weight:	3.55 kg
Display:	256 X 64 OLED
Power requirement:	100-230VAC 50-60Hz

KINGSAT

Maritime Antennas

地址：广州市南沙区黄阁镇吉盛路2号莲丰创意园A栋　　电话：+86-20-28662868　　邮箱：sales@kingsat-tech.com　　网址：www.kingsat-tech.com　www.eardatek.com