



RADAR ANTENNA
Installation Manual

MDS-12 4Kw Radome Antenna



FC CE



"DANGER", "WARNING" and "CAUTION" notices throughout this manual. It is the responsibility of the operator and the installer of the equipment to read, understand and follows these notices. If you have any questions regarding these safety instructions, please contact an SI-TEX agent or dealer.



Do not open the equipment.

Hazardous voltage which can cause electrical shock, burn or serious injury exists inside the equipment. Only qualified personnel should work inside the equipment.



Wear a safety belt and hard hat when working on the antenna unit.

Serious injury or death can result if someone falls from the radar antenna mast.



Stay away from transmitting antenna.

The radar antenna emits microwave radiation which can be harmful to the human body, particularly the eyes. Never look directly into the antenna radiator from a distance of less than 1 m when the radar is in operation.



Turn off the radar power switch before servicing the antenna unit. Post a warning sign near the switch indicating it should not be turned on while the antenna unit is being serviced.

Prevent the potential risk of someone being struck by the rotating antenna and exposure to the RF radiation hazard.

Do not disassemble or modify the equipment.

Fire, electrical shock or serious injury can result.

Turn off the power immediately if water leaks into the equipment or the equipment is emitting smoke or fire.

Continued use of the equipment can cause fire or electrical shock.

Do not place liquid-filled containers on top of the equipment.

Fire or electrical shock can result if liquid spills into the equipment.

FOREWORD

Thank you for choosing SI-TEX marine radar antenna. The radar antenna is designed and constructed to meet the rigorous demands of the marine environment. However, no machine can perform its intended function unless properly installed and maintained. Please carefully read and follow the recommended procedures for installation, operation and maintenance. While this unit can be installed by the purchaser, any purchaser who has doubts about his or her technical abilities may wish to have the unit installed by an SI-TEX Dealer or other qualified technician.

We want to Hear from you!

Again, Thank you for purchasing SI-TEX Equipment.

Features

The main features of the SI-TEX marine radar antenna:

- Traditional SI-TEX quality and reliability in a compact, lightweight and low-cost radar antenna.
- Digital radar target technology.
- Share the same protocol between all SI-TEX magnetron pulse radar antennas.
- Built-in excellent sea and rain clutter algorithm.
- Fully digital signal processing.
- High performance microwave front end.

MDS-12 SPECIFICATIONS

ANTENNA UNIT

1. Radiator: Slotted waveguide array
2. Radiator length: 55 cm
3. Horizontal beamwidth: 4°
4. Vertical beamwidth: 25°
5. Sidelobe:
 Within $\pm 20^\circ$ off mainlobe; less than -18 dB
 Outside $\pm 20^\circ$ off mainlobe; less than -23 dB
6. Polarization: Horizontal
7. Antenna rotation speed: 24 rpm (± 2)
8. Wind resistance: Relative wind speed 100 knots (51.5 m/s)

TRANSCEIVER MODULE (contained in radome)

1. Transmitting tube: MSF1421B or MAF1421B
2. Frequency: 9410 MHz ± 30 MHz
3. Peak output power: 4kW nominal
4. Pulselength & pulse repetition rate:
 0.08 μ S, 2100 Hz (0.125, 0.25, 0.5, 0.75, 1.5nm)
 0.3 μ S, 1200 Hz (1.5, 2, 3nm)
 0.8 μ S, 600 Hz (3, 4, 6, 8, 12, 16, 24, 36nm)
5. Warm up time: 1:30 minutes
6. Modulator: FET switching method
7. I.F.: 60MHz
8. Tuning: Automatic or manual
9. Receiver front end: MIC (Microwave IC)
10. Bandwidth:
 Tx pulselength 0.3 μ S and 0.08 μ S: 25MHz
 Tx pulselength 0.8 μ S: 3MHz
11. Duplexer: Circulator with diode limiter
12. WIFI module (For KRA-1007W only)

Standard	IEEE802.11n, IEEE802.11g, IEEE802.11b
Channels	1-11
Frequency range	2.4-2.4835G
Transmit power	15~20dBm

POWER SUPPLY UNIT

1. For MDS-12: +/-12VDC external regulated power supply

ENVIRONMENT

1. Temperature:
Antenna unit; -25°C to + 70 °C
2. Humidity:
Relative humidity 93% or less at+ 40°C
3. Compass safe distance:

	Standard Compass	Steering Compass
Antenna unit	130cm	95cm



1. INSTALLATION

This chapter provides the procedures necessary for installation.

Installation mainly consists of the following:

- sitting and mounting the display unit and antenna unit
- connection of the signal cable and the power cable
- establishing the ground
- checking the installation, and
- adjustments.

1.1 Antenna Unit Installation Sitting, handling considerations

- The antenna unit is generally installed either on top of the wheelhouse or on the radar mast on a suitable platform. Locate the antenna unit where there is a good all-round view as far as possible, no part of the ship's superstructure or rigging intercepting the scanning beam. Any obstruction will cause shadow and blind sectors. A mast for instance, with a diameter considerably less than the width of the radiator, will cause only a small blind sector, but a horizontal spreader or crosstrees in the same horizontal plane as the antenna unit would be a much more serious obstruction; you would need to place the antenna unit well above or below it.
- It is rarely possible to place the antenna unit where a completely clear view in all direction is available. Thus, you should determine the angular width and relative bearing of any shadow sectors for their influence on the radar at the first opportunity after fitting. (The method of determining blind and shadow sectors appears later in this chapter.)
- If you have a radio direction finder on your boat, locate its antenna. Clear the antenna unit, to prevent interference to the direction finder. A separation of more than two meters is recommended.
- To lessen the chance of picking up electrical interference, avoid routing the signal cable near other onboard electrical equipment. Also avoid running the cable in parallel with power cables.
- The compass safe distance should be observed to prevent deviation of the magnetic compass.

Standard compass	Steering compass
1.3m	0.7m

Mounting of the MDS-12 Radome

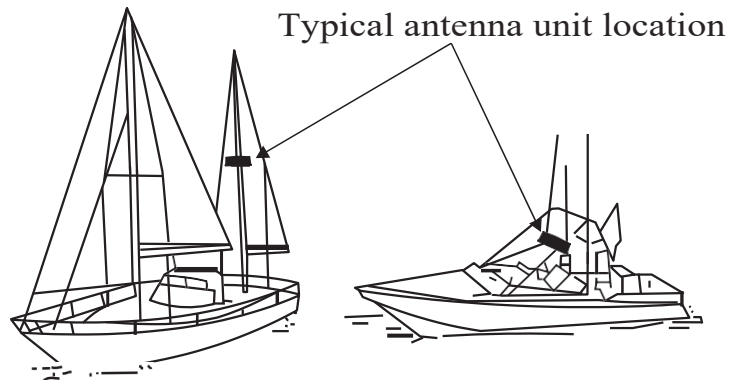


Figure 1-1 Typical antenna unit location

Unpacking the antenna unit

1. Open the antenna unit packing box carefully.
2. Unbolt the four bolts at the base of the radome to remove the radome cover.

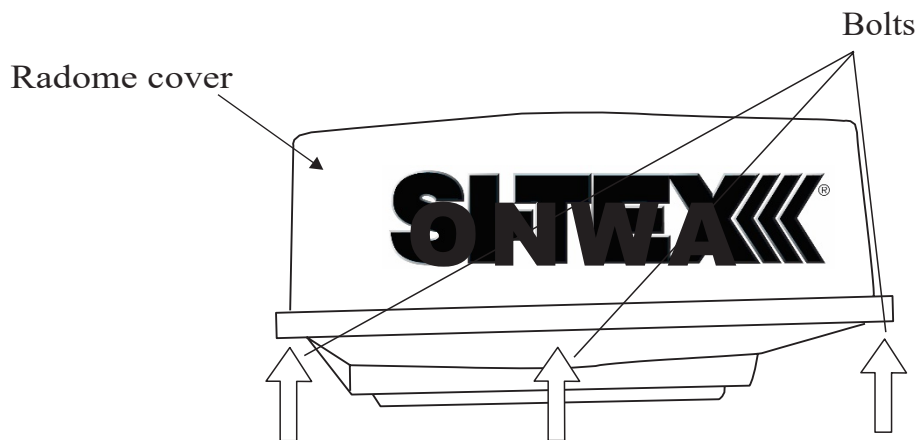


Figure 1-2 Antenna unit

3. Drill holes in the antenna mounting platform in accordance with the previous removal of the base mounting map.

Note: the hole is arranged in parallel with the center line of the ship.

4. Loosen the antenna cover and the base of the 4 screws, carefully remove the cover.

5. Remove the cable clamping plate by unfastening four screws and removing a gasket.

6. Pass the cable through the hole at the bottom of the radome base.

7. Secure the cable with the cable clamping plate and gasket. Ground the shield and vinyl wire by one of the screws of the cable clamping plate.

8. Connect the wire to the Video Processing unit.

(1) 4-pin connector to J18

(2) RJ45 connector to J12

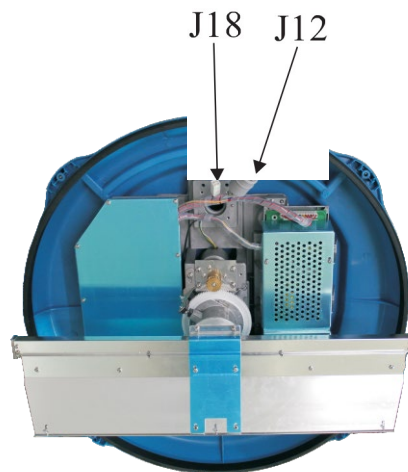


Figure 1-3 Location of J18/J12

10. Fix the shield cover. Do not pinch the cable.

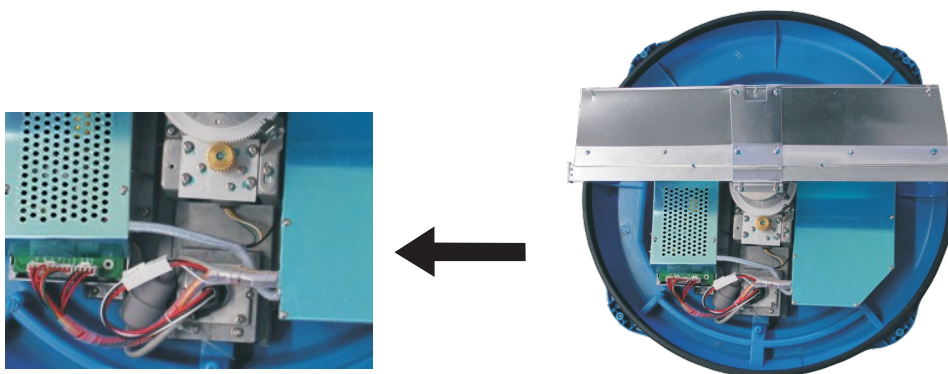


Figure 1-4 Antenna Cable Wiring

11. Loosely fasten the radome fixing bolts. You will tighten them after confirming the **unit** is working normally.

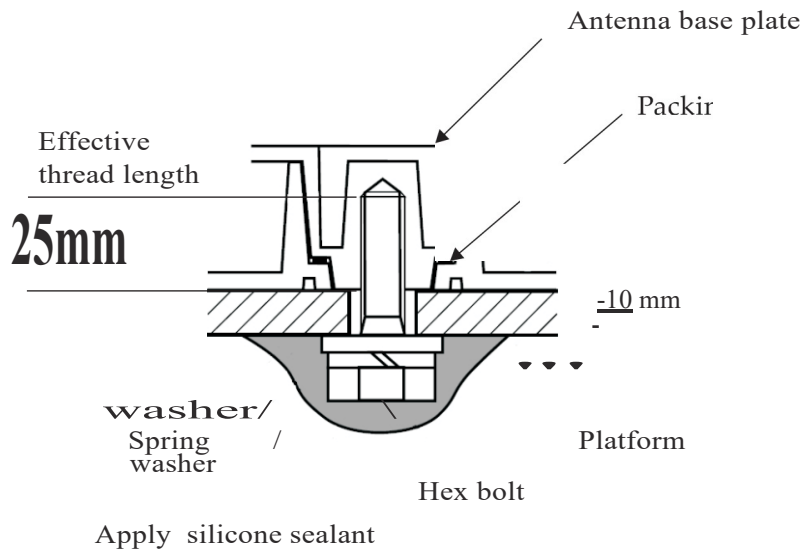
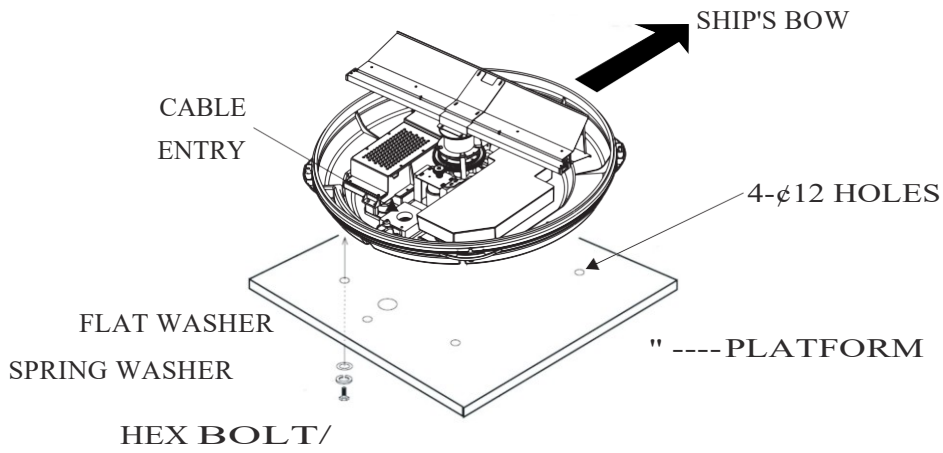
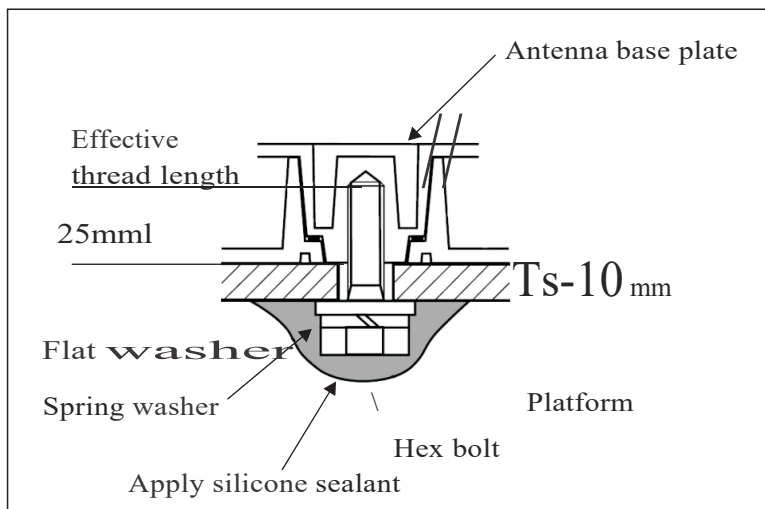
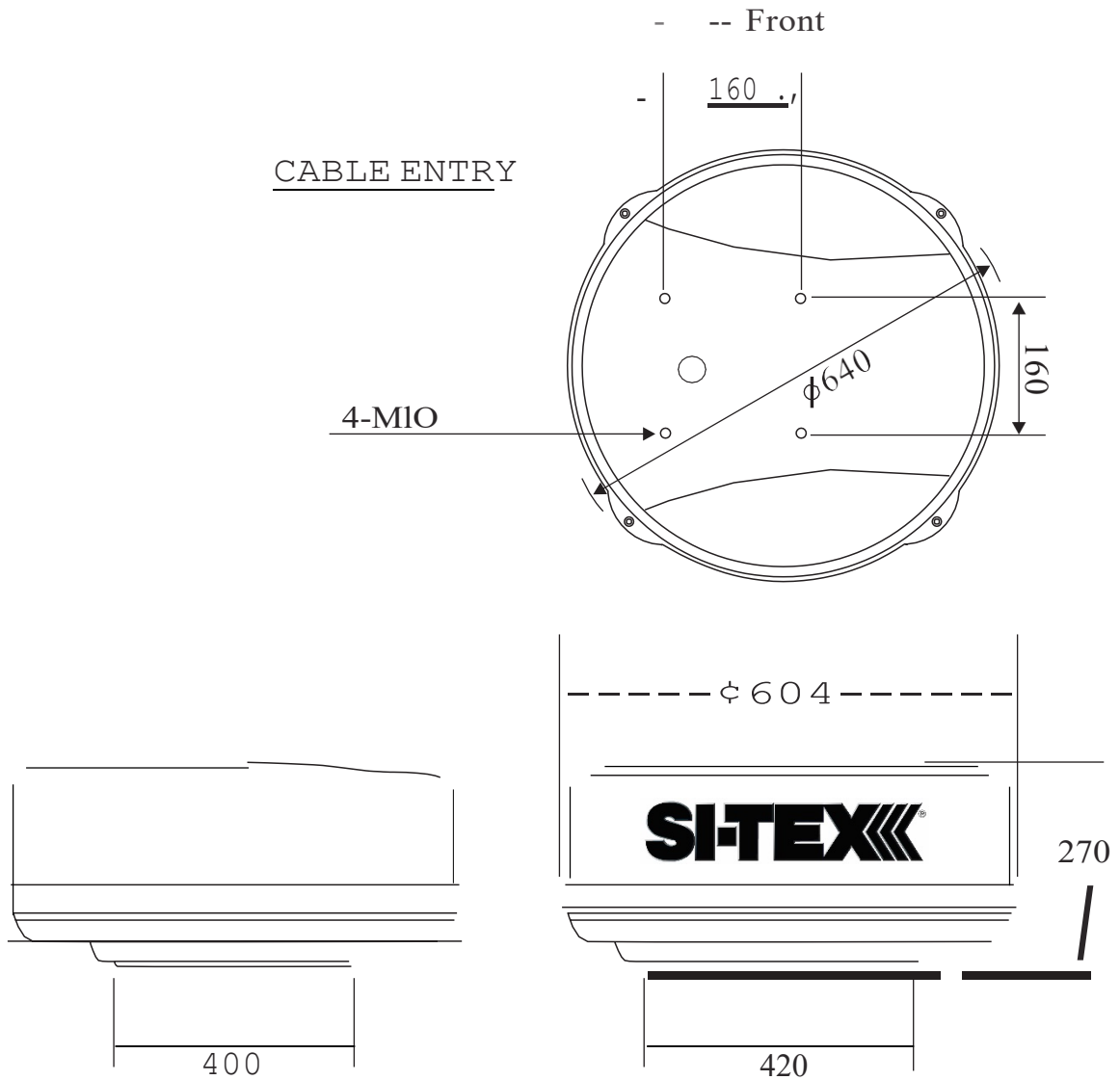


Figure 1-5 How to fasten the radome base to the mounting platform

3. MDS-12 DRAWINGS AND DIMENSIONS

3.1 MDS-12





Radar WI-FI Module Installation Instructions:

When the MDS-12 is going to be installed for use with a SI-TEX NavPro Unit, instead of the SI-TEX NavStar MFD, a separate WI-FI Module is supplied so that the MDS-12 can be connected to the NavPro Units via a WI-FI Connection rather than hardwired via the Cat5 Ethernet Connection.





Thank you for purchasing a SI-TEX MDS-12 WIFI Radar.

The system has been designed with a remote WIFI module rather than installing the WIFI transmitter inside the antenna. This was done to make sure that you always have a strong signal from the Radar Antenna at the SI-TEX NavPro Display. If the module was installed inside the radar antenna the chances of the signal being blocked in the case of a Steel or Aluminum wheelhouse was a major consideration.

In all cases a power wire would need to be run to the antenna so a remote WIFI module was preferred.

Once the system is installed and powered up for the first time, you will need to go into the NavPro Ports and Connections Menu and turn on WIFI.

Once you do that you will see a WIFI selection of (RADAR-) For example RADAR-05**

Select the Radar WIFI input

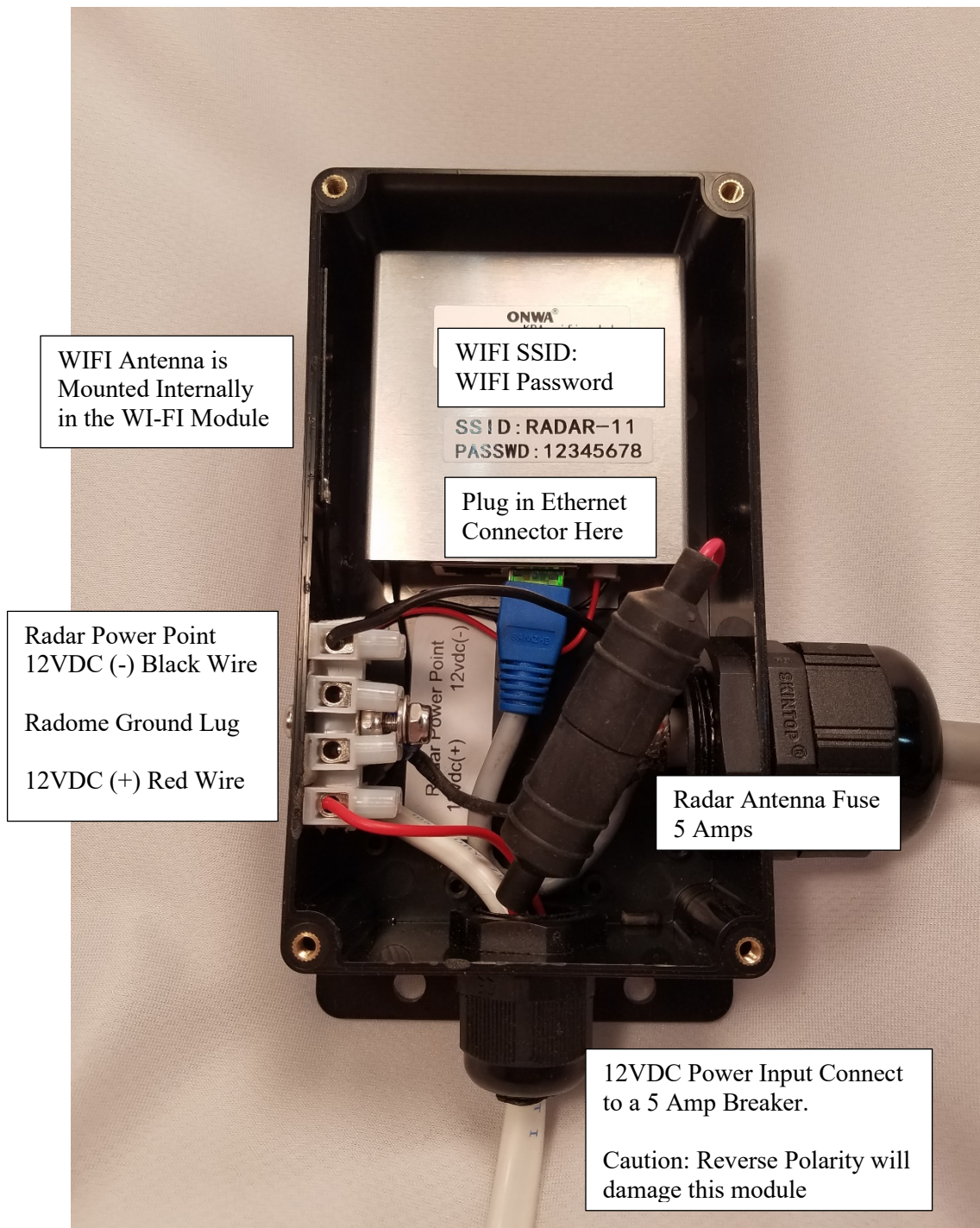
After selecting the Radar input it will ask you for a Password.

In all cases the Password is 12345678

Once this is completed the system is ready to use.

It is recommended that before installation you connect the SI-TEX NavPro to the Internet at home via WIFI connection and allow the system to do an Automatic Software Update. This will ensure that you have the most up to date operating software for the best Radar performance.

One of the nice features of the SI-TEX NavPro system is that whenever it has an Internet connection it will automatically check with SI-TEX to make sure it has the latest operating software. It is advisable to occasionally connect the NavPro to the Internet and let it check for software updates.



SI-TEX WI-FI Module Installation Instructions