



APEX ORION/LYNX QUICK START GUIDE

INTRODUCTION

The Apex Orion and Lynx units are typically preconfigured at the factory based on customer requirements specified at time of sale. This guide describes the basic steps that need to be taken for to set up a 1+0 unprotected link for both preconfigured and default configuration hardware.

Configuration items in the radio units that should be changed:

- 1) IP address of the radios for management
- 2) Add VLAN membership per port to support any VLANs that will be used.
- 3) Set the transmit frequency per the license granted **(If not already done by factory)**
- 4) Enter any license keys. **(If not already done by factory)**
- 5) Set the channel bandwidth and modulation range. **(If not already done by factory)**
- 6) Set the transmitter power and configure ATPC. **(If not already done by factory)**
- 7) Set the Opmode to "ON"
- 8) Save changes

The preconfigured setup of the radios is as follows:

PARAMETER	SIDE A	SIDE B
IP Address:	192.168.100.100	192.168.100.101
Subnet Mask:	255.255.255.0	255.255.255.0
Gateway:	192.168.100.1	192.168.100.1
IBM:	On	On
IBM/Data Port:	GE1	GE1
Transmit Frequency:	Customer Specified	Customer Specified
Channel BW:	Customer Specified	Customer Specified
Max Mod:	Customer Specified	Customer Specified
Min Mod:	Customer Specified	Customer Specified
Transmit Power:	Customer Specified	Customer Specified
ATPC:	Customer Specified	Customer Specified
Transmit enable :	On	On

Step 1 – Install Antennas and Rough Align

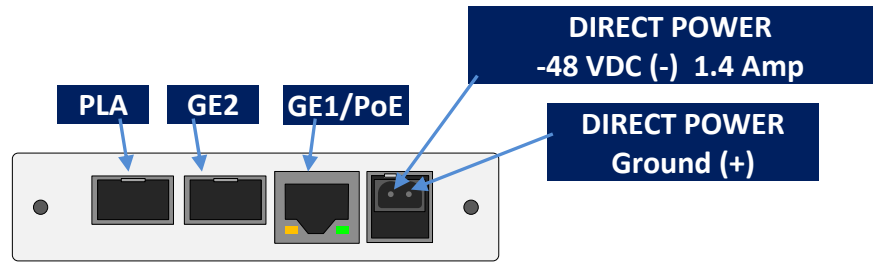
Install the Antenna per the Antenna Installation Manual and visually align. Visually verify the path is not blocked and that the Fresnel Zone is clear and matches the path analysis that should have been done already. The Trango [PathCheck](#) App can assist with this function. Leave the protective tape on the antenna for now.

Step 2 – Prepare Cables and Power Up – Before Installing on Antenna

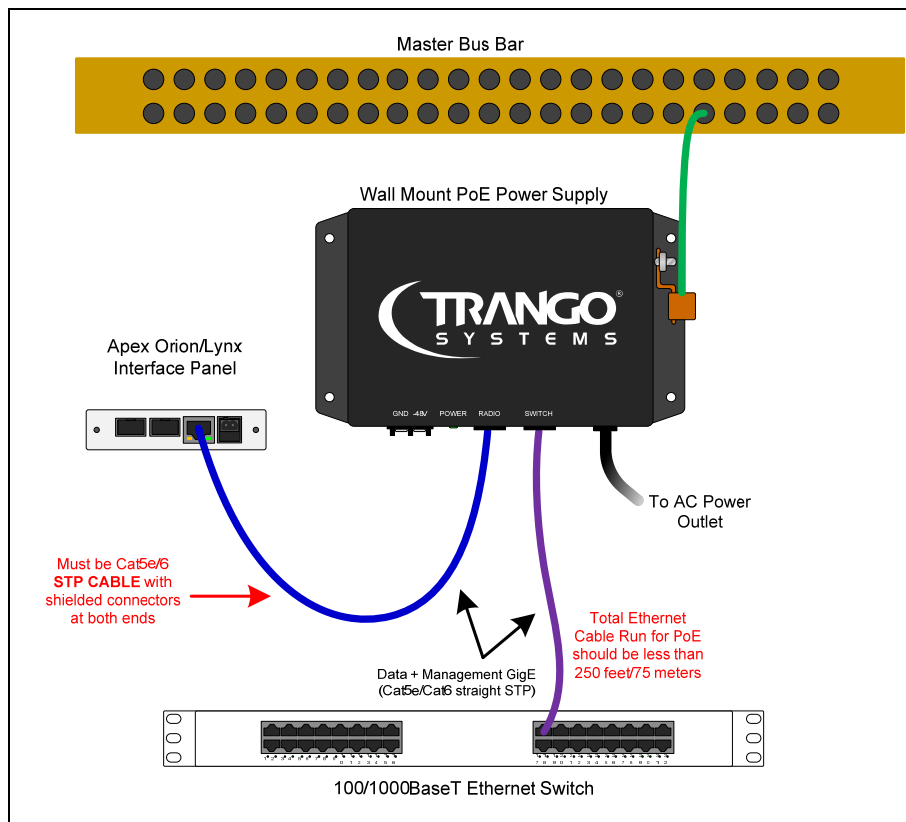
Cat 5e or Cat 6 Shielded Twisted Pair Cable must be used for connections to the RJ45 Copper Port to prevent CRC errors and provide a ground return path for the Power over Ethernet. Use the Shielded Connectors provided with the PoE Injector or Power Supply and ensure that the connector shield is electrically connected to the cable shield and preferably soldered. Cable runs when using PoE should not be longer than 250 ft/75 meters to prevent CRC errors.

Apply power to the radio via PoE or directly using -48 VDC power. Ensure the PoE or direct power ground is connected to the Shelter bus ground or the base of the tower leg using a ground wire.

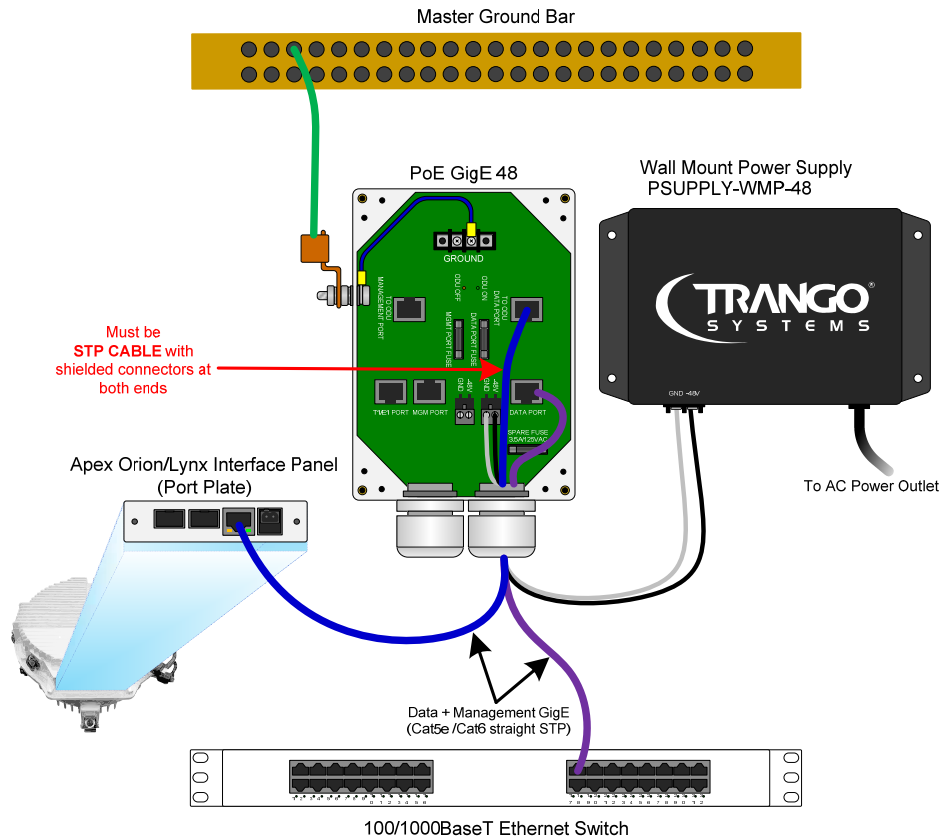
DO NOT use a +48VDC power supply or any supply which has a grounded negative rail or damage may occur. Use Trango Power supply PS-WMP-48L for best results.



Apex Orion/Lynx Front Panel Layout



Apex Orion/Lynx Basic PoE Wiring

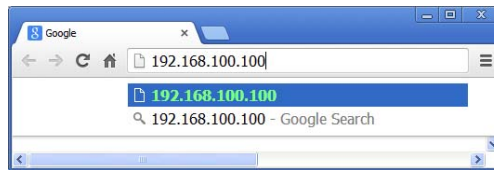


Apex Orion/Lynx PoE +Surge Protection Wiring (Recommended)

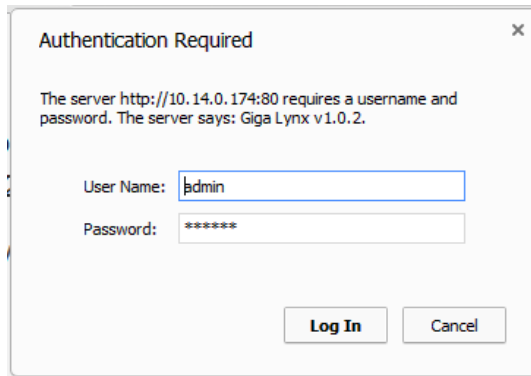
Step 3 – Configure IP Address – Before Installing on Antenna

Configure the IP Address of each radio using the web browser such as Google Chrome™. Make sure the computer being used has its IP address and subnet set properly to allow access to radio IPs 192.168.100.100 and 192.168.100.101.

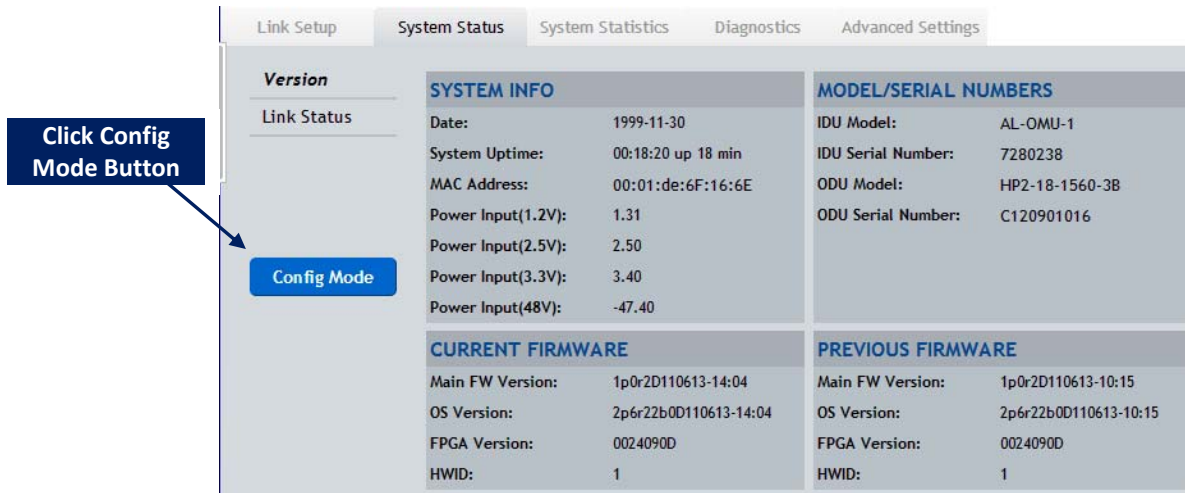
Enter the IP Address into the browser interface to reach the radio unit.



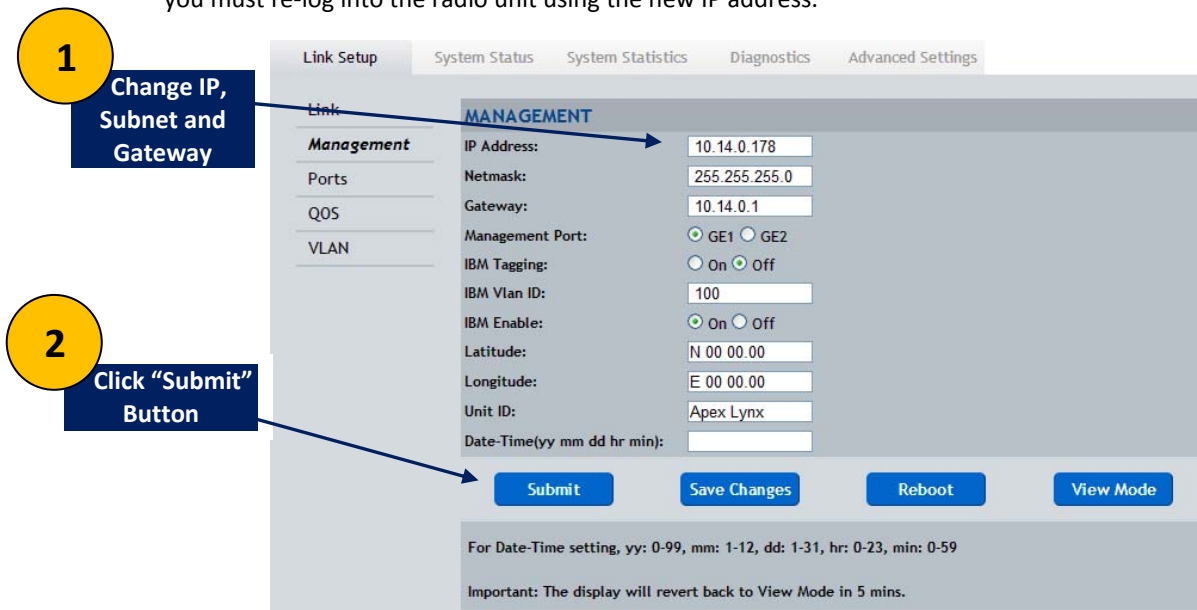
When prompted, enter the username **“admin”** and password **“trango”** for the View Mode .



The System Status >Version page will be displayed as shown below:



Click the Config Mode button on the left side of the browser to enter the Config Mode. When prompted, enter the username “*config*” and password “*trango*”. Change the Gateway, IP address, subnet mask, as shown below, then Click “Submit” to make the IP changes permanent. The connection will be lost and you must re-log into the radio unit using the new IP address.



Step 4 – Add VLANs– Before Installing on Antenna

After changing IP Addresses, re-log into each radio and add VLAN membership by port for any VLAN tagged traffic that will be used in the datapath using the *Link Setup>VLAN* page in Config Mode as shown below. Add the VLAN ranges that will be used, if any, then click the Submit button. The VLANs added should be displayed in the VLAN Info window. Click Save Changes to store the changes in FLASH memory. VLAN membership must be done on both radios in the link.

The screenshot shows the 'Link Setup' configuration page for a radio. The 'VLAN' tab is selected. The 'PORT' is set to 'GE1'. The 'VLAN Add' field is set to '0' and the 'Upper Limit' is also '0'. The 'VLAN Remove' field is set to '0' and the 'Upper Limit' is also '0'. The 'VLAN Info' window shows 'ETH 1:' and 'ETH 2: 1, 300, 400-500,'. At the bottom, there are buttons for 'Submit', 'Vlan Clear', 'Save Changes', 'Reboot', and 'View Mode'. A warning message at the bottom states: 'Important: The display will revert back to View Mode in 5 mins.'

Numbered callouts on the left side of the image indicate the following steps:

- 1 Select Port
- 2 Add VLAN ID membership for tagged traffic
- 3 Click "Submit" button

Step 5 – Configure Radios-Before Installing on Antenna (If required)

Set the following items via the web or through the CLI if not previously done at the factory

- 1) IF ODU power is OFF, Click ODU power "ON" button, then click the Submit button.
- 2) Enter the TX frequency, TX Power, and Channel Bandwidth per the license granted in units of MHz. Verify the Freq Duplex is correct. Click the Submit button. Repeat on second radio, making sure the TX frequency matches the RX frequency from the first radio.

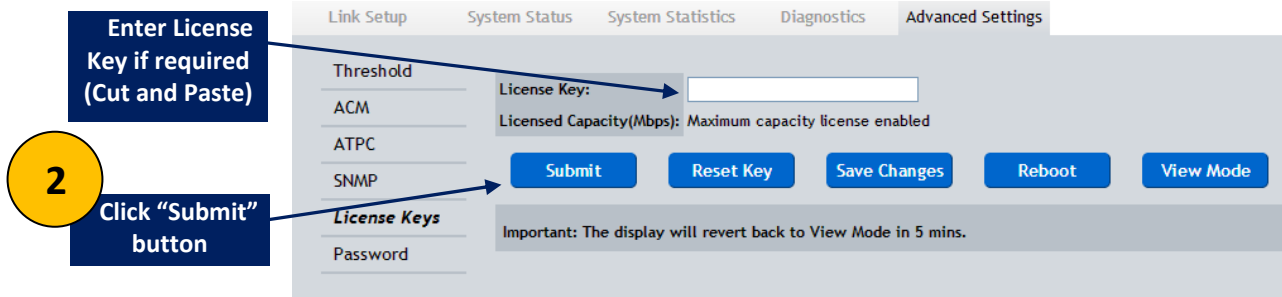
The screenshot shows the 'Link Setup' configuration page for a radio, specifically the 'RF LINK' tab. The 'Tx Frequency(MHz)' is set to '23560.00', 'Freq Duplex(MHz)' is '1200.00', 'Rx Frequency(MHz)' is '22360.00', and 'Tx Power(dBm)' is '10.00'. The 'Transmitter' is set to 'On', 'Channel Bandwidth' is '60MHz', 'Min Modulation' is 'QPSK', and 'Max Modulation' is 'QAM1024'. The 'ODU Power' is set to 'On'. The 'Set Capacity(SM/LG)(Mbps)' is '761.00/ 486.00'. At the bottom, there are buttons for 'Submit', 'Save Changes', 'Reboot', and 'View Mode'. A warning message at the bottom states: 'Important: The display will revert back to View Mode in 5 mins.'

Numbered callouts on the left side of the image indicate the following steps:

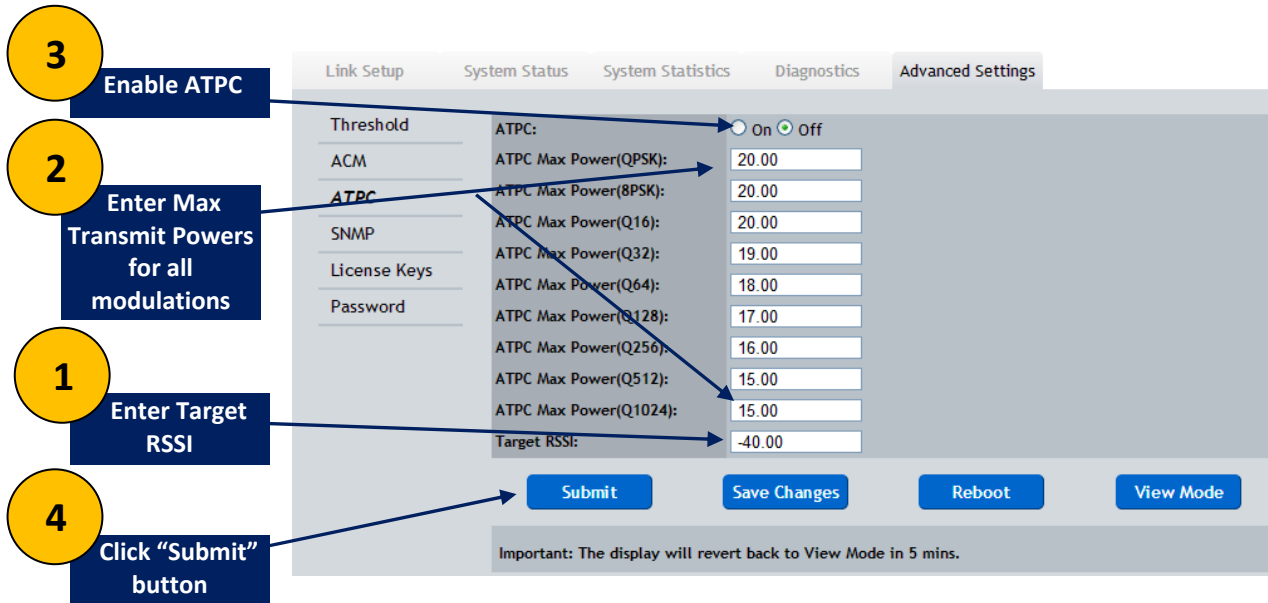
- 1 Click ODU Power "ON"
- 2 Set TX Frequency, Power, and Channel Bandwidth
- 3 Click "Submit" button

- 3) Enter any license keys. Click the Submit button.

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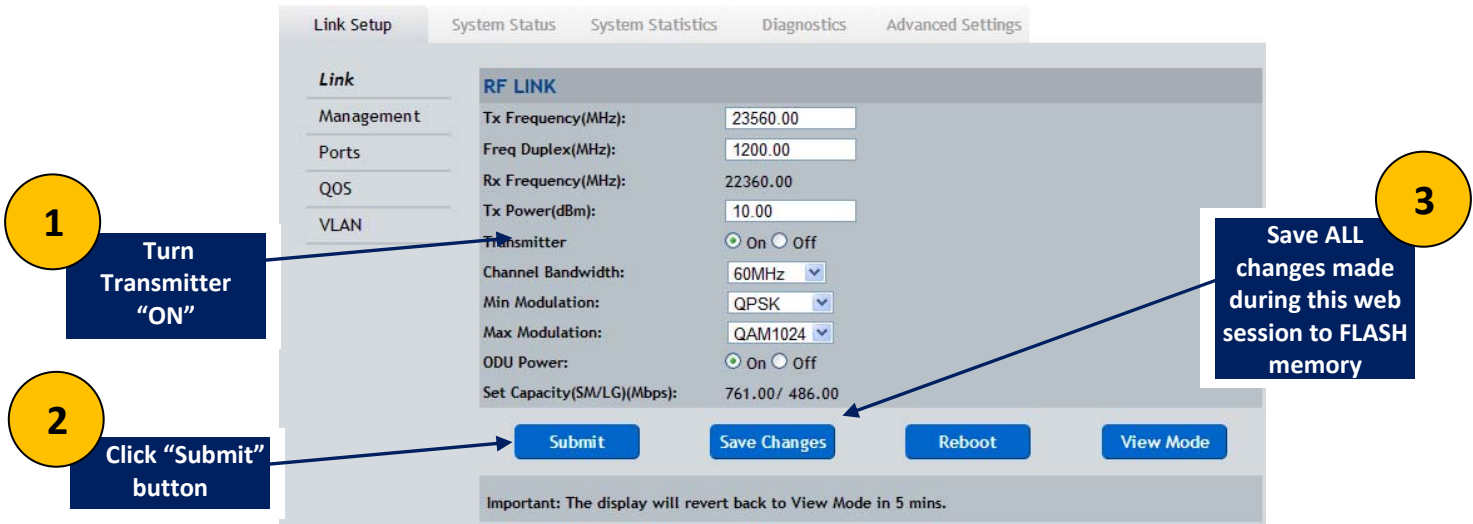
- 4) Configure Automatic Transmit Power Control (ATPC) if desired. Enter the max power levels for each modulation level per the datasheet or License. Enter the Target RSSI which should match the expected RSSI from the path analysis. Enable ATPC by clicking the ATPC on button. Click the Submit button to make changes effective.



Step 6 – Turn Transmitter ON and Save Changes

After all settings from step 5 are completed on both ends of the link, the transmitter can be turned on and the link should be established if the units are mounted on a test fixture.

- 1) Turn the transmitter on by clicking the transmitter “ON” button on the *Link Setup>Link Page*, then the Submit Changes button.
Save all the changes made from Steps 5 and 6 using the *config save* command from CLI or clicking the Save Changes button from the *Link Setup>Link Page* on the web interface.



At this point power can be removed from the radios and they can be installed on the antennas. When power is applied next time, all the settings will be restored and the link will automatically be established after alignment is completed.

Step 7 – Install Radios on Antennas

Remove the protective tape from the antenna before attaching the radio and use silicone grease provided with the antenna around the antenna o-ring. Connect the radio to the antenna with one end having the “V” marking at the 12 O’clock position if Vertical polarization is to be used or the “H” marking at the 12 O’clock position if Horizontal Polarization is to be used. **BOTH ENDS OF THE LINK MUST HAVE THE SAME POLARIZATION INDICATOR AT THE 12 O’clock POSITION.** Ensure that all 4 latches are securely snapped into place.

Attach a 12 AWG ground wire from the Radio grounding lug to the Tower leg using grounding kit.

Step 8 – Fine Align Antennas

Carefully align the antennas and ensure that the expected RSL +/- 3 dB is obtained using a multimeter connected to the BNC male connector with CBLDAT-RSSI and adjusting the antenna until the expected voltage is read on the multimeter per the chart below. The green LED should be solid when the link is locked. Tighten all bolts on antennas and verify RSL voltage is unchanged.

NOTE: The voltage is updated approximately 2 times per second so **turn the alignment bolts on the antenna slowly** to avoid missing a peak.

RSL (dBm)	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20
BNC Voltage (V)	0.10	0.42	0.73	1.05	1.37	1.69	2.00	2.32	2.64	2.95	3.27	3.59	3.90	4.22	4.54

Step 9 – Verify Link

Make sure that there are still no CRC errors on the input Ethernet ports and that the ports are running at Gigabit speed, the BER is 0. As a general rule the MSE should be lower than -36 for all links (-38 typical) with an RSL of -50 dBm or stronger. Below -50 dBm RSL, the MSE may start to increase depending upon the channel size.

Step 10 – Weatherproof the Ports

After verifying the link is good and traffic is flowing, tighten the port plate down onto the radio using the two flat head stainless steel screws and ensuring a tight fit. Fill unused holes on the Cable Gland with provided rubber dowel and tighten around the cables to prevent water from intruding.

Full USER MANUAL available at support.trangosys.com