

Maintenance and Troubleshooting

The Terragraph radio does not report power

1. Using a digital multimeter verify that the DC voltage and polarity at the Terragraph power terminal block is correct or using a or POE tester verify that the correct pins are providing the correct DC voltage.
2. Verify that the ground is connected and secured properly.
3. If the DC voltage, polarity, and ground are correct, verify that the radio has power as follows:
 - a. Verify that the power connector for the Terragraph is secured.
 - b. Using the power LED, verify that the radio is powered on.
 - c. Power cycle the radio as follows:
 - i. Remove and reseat the power connector to the radio, or
 - ii. Disconnect and reconnect power to the power supply.
 - iii. Using the Power LED, verify that the radio is powered on.
Note: It takes 1 to 2 minutes for the radio to restart.
 - iv. If the preceding steps does not resolve the issue, replace the Terragraph radio.

Fiber is connected, but the remote switch/router indicates no link integrity

1. If you are using a 1GP SFP, set the SFP module port speed in the Terragraph NMS to 1GB. The default is 10GB.
2. Verify that the device at the remote end of the fiber is powered on and correctly configured.
3. Verify that the fiber type and SFP in use at both ends is the same: Single-mode or Multi-mode.
4. Verify that the SFP speed is the same at both ends: 1GB or 10GB.
5. Verify the fiber polarity: the TX/RX of the remote SFP plugs in to the RX/TX of the near end SFP.
6. Using a fiber cable tester, verify that the Terragraph radio is receiving light power through the fiber.
7. Connect the fiber cable to a known good SFP module.
8. Plug the SFP module in to the Terragraph radio.
9. If the problem persists, replace the Terragraph radio.

Ethernet connected to Terragraph, but Ethernet device indicates no link integrity:

1. Verify that the Ethernet device is powered on and correctly configured.
2. If the Ethernet device is powered by POE, verify that it is connected to the primary radio.
3. Test the Ethernet cable from the Terragraph radio to a known good laptop.
4. Remove the Ethernet cable from the Terragraph radio and use the cable tester to verify cable integrity.
5. If the problem persists, replace the Terragraph radio

Wireless link does not come up or has poor signal strength

1. Verify that the radios at both ends of the link are powered on.
2. Verify that the radios at both ends of the link are aligned.
3. Verify that a wireless link is created between the proper radios at the site.
4. Power cycle the radios at both ends of the link.
5. If the problem persists, replace the Terragraph radio.

Product Specifications

Product Specifications	Specification Value
Physical	
Dimensions (without bracket)	176.92mm (W) x 176.92mm (L) x 199.75mm (H)
With bracket	176.92mm (W) x 176.92 (L) x 279.59mm (H)
Environmental conditions	
Operating temperature range:	-40C to +55C
Ingress Protection:	IP55 (TBD)
Power	
Input Power	DC 44V-57V, max 4 Amps
PoE Output Power	IEEE 802.3af
	IEEE 802.3at
Power Consumption (without PoE)	75 W
Interfaces	
Network ports	1 Gigabit Ethernet ports 10Gb SFP+
Radio	
Operating Frequency	57GHz – 66GHz
Number of Channels	Four
Channel Bandwidth	2.16GHz
EIRP	43dBm peak; 40dBm average
Average Modulation	BPSK, QPSK, 16QAM
Certifications	
FCC ID	2AK7S-FBC2001 (TBD)
UL Listed NWGQ	E484144 (TBD)

Antenna Specifications

Parameter	Specification	Description
Frequency Bandwidth	57.24 – 65.88 GHz	WiGig channels 1, 2, 3, 4
Maximum EIRP	43 dBi peak 40 dBm average	Will be limited by firmware
Number of elements per array	128	Assuming 4 tiles of 32 elements each
Half power beam width	Az = 20° El = 2.5°	Typical boresight value at band center
Azimuth scan angle range	±45°	Product design requires ±45° for full azimuthal coverage
Grating lobe level	TBD	Grating lobe outside ±45° field of regard can be mitigated by TBD design approach
Gain Flatness	TBD	Gain flatness over channel and band is TBD
Gain, Average	28 dBi	Typical boresight value at band center
Aperture polarization	Linear	Vertically polarized in typical installation
Operating Temperature	-40C to +55C	