

# 4m LEO Earth Station antenna

The Calian 4m LEO Earth Station antenna system provides high accuracy, high efficiency Cassegrain optics and high-speed slewing making it suitable for tracking faster targets, including low-earth-orbit (LEO) and medium-earth-orbit (MEO). The optional 3rd tilt axis ensures uninterrupted tracking over the keyhole. The use of advanced manufacturing techniques results in a major step forward in affordable precision antenna design.

The antenna can be fitted with several different feeds to support your application. Our ground station integration experience in the satellite industry means this antenna is designed to meet the needs of your network.

## Specifications

### General configuration

Configuration	<ul style="list-style-type: none"> <li>Dual reflector Cassegrain design</li> </ul>
Main reflector	<ul style="list-style-type: none"> <li>4m diameter</li> <li>Precision formed aluminum</li> <li>Surface accuracy &lt; 0.010" RMS</li> </ul>
Sub reflector	<ul style="list-style-type: none"> <li>High surface accuracy construction</li> </ul>
Mounting	<ul style="list-style-type: none"> <li>Counterweight arms with mounting frames for minimum of 500 lbs. of RF equipment placement or as needed</li> </ul>
Pedestal	<ul style="list-style-type: none"> <li>High stiffness reinforced pedestal</li> </ul>
Optional	<ul style="list-style-type: none"> <li>De-icing system</li> <li>Adjustable polarization</li> <li>Fixed 3rd axis</li> <li>Active 3rd axis</li> </ul>

### M&C interface

- Ethernet interface for M&C and user interface
- Full remote operation and monitoring with multiple tracking options
- The antenna can be controlled via the web GUI application or via a customer interface

### Mechanical performance

Pointing accuracy • < 0.018°

Speed	<ul style="list-style-type: none"> <li>Up to 15°/s in azimuth</li> <li>Up to 15°/s in elevation</li> </ul>
Acceleration	<ul style="list-style-type: none"> <li>Up to 15°/s<sup>2</sup> in both axes</li> </ul>
Travel range	<ul style="list-style-type: none"> <li>±270° in azimuth (540° continuous)</li> <li>0°- 90° in elevation</li> </ul>
Axis configuration 1	<ul style="list-style-type: none"> <li>±270° in azimuth (540° continuous)</li> <li>0°- 90° in elevation</li> </ul>
Axis configuration 2	<ul style="list-style-type: none"> <li>Three axis motion, no keyhole</li> <li>Elevation over azimuth, with 7° tilt</li> </ul>
Drives	<ul style="list-style-type: none"> <li>Dual torque biased backlash-free drives in all axes</li> </ul>

### Power

Drive systems	<ul style="list-style-type: none"> <li>380 to 480VAC 50/60Hz 3-phase or 200 to 240VAC 50/60Hz 3-phase</li> </ul>
De-icing system	<ul style="list-style-type: none"> <li>208VAC 60Hz 3-phase or 400VAC 50Hz 3-phase</li> </ul>
Auxiliary circuits	<ul style="list-style-type: none"> <li>208/120VAC 60Hz or 230VAC single phase 50Hz</li> </ul>

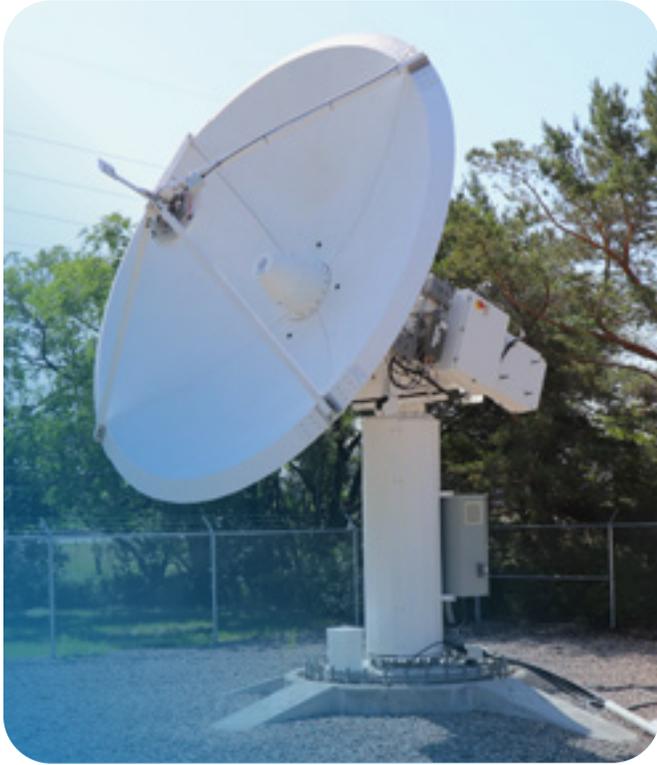
### Optional frequency bands

- Supports single, dual, tri-band feeds, S to Ka
- CP and LP broadband feed options available

### Tracking options

Multiple open and closed loop tracking options include:

- Program track
- NORAD TLE
- Step Track (optional)
- Monopulse (optional)



## Environmental performance

<b>Temperature</b>	<ul style="list-style-type: none"> <li>Operational -30 to +60°C</li> <li>Survival -40 to +70°C</li> </ul>
<b>Seismic</b>	<ul style="list-style-type: none"> <li>0.3g horizontal and vertical</li> </ul>
<b>Wind speed</b>	<ul style="list-style-type: none"> <li>Operational 72kph (45mph) Gusting up to 100 kph (62 mph)</li> <li>Survival: 200 kph (125 mph)</li> </ul>
<b>Humidity</b>	<ul style="list-style-type: none"> <li>0 to 100% with condensation</li> </ul>
<b>Ice accumulation</b>	<ul style="list-style-type: none"> <li>30mm thick on all exposed surfaces</li> </ul>
<b>Corrosion</b>	<ul style="list-style-type: none"> <li>Galvanized ASTM-A123, stainless and galvanized fasteners, multi-layer epoxy-based paint</li> </ul>

## Shipping configuration and features

- Modular design to allow for easy shipping in standard containers
- Rapid deployment, assembly, and commissioning at customer site

## Ka-band performance

	Rx	Tx
Frequency (GHz)	17.70 - 21.50	27.50 - 31.00
Feed Ports	2 CP	2 CP
Antenna Gain @ mid band	56.1 dBi	59.4 dBi
Beamwidth @ -3dB	0.22°	0.16°
G/Ts at Clear Sky @ 20° Elevation		
17.70 GHz	32.4 dB/K <sup>*1</sup>	
19.60 GHz	33.0 dB/K <sup>*1</sup>	
21.50 GHz	33.3 dB/K <sup>*1</sup>	
Power handling, per port (CW)		650 W
VSWR (Feed interface)	1.30	1.30
Cross Pol Isolation	30.8 dB	30.8 dB
Port to Port isolation Rx → Tx, Tx → Rx	85 dB	85 dB
Port to Port isolation Rx → Rx, Tx → Tx	17 dB	17 dB
Sidelobes	Meets ITU-R S-580-6	

<sup>\*1</sup>The G/T is evaluated with a 110K LNA bolted at the feed interface.