

# 10m–15m High performance antenna

Calian high performance antennas are platforms intended for a wider variety of applications beyond satcom, including electronic warfare, radar, astronomy, and fast-target tracking. These antenna platforms combine high-slew-rate motion systems, and adaptable antenna interfaces to accommodate different applications and frequencies. We offer high accuracy optics with optimized reflector shaping for elevated efficiency. Advanced control systems can be adapted to user requirements, enabling a variety of tracking or targeting capabilities.

## Specifications

### General configuration

<b>Configuration</b>	<ul style="list-style-type: none"> <li>Dual reflector Cassegrain design</li> <li>2 axis motion, elevation over azimuth</li> </ul>
<b>Main reflector</b>	<ul style="list-style-type: none"> <li>10 - 15m diameter</li> <li>Precision formed aluminum</li> <li>Surface accuracy below 0.008 RMS</li> </ul>
<b>Sub reflector</b>	<ul style="list-style-type: none"> <li>High accuracy composite</li> <li>Surface accuracy below 0.002 RMS</li> </ul>
<b>Hub</b>	<ul style="list-style-type: none"> <li>Up to 10 ft. diameter for RF equipment integration available upon request</li> </ul>
<b>Pedestal</b>	<ul style="list-style-type: none"> <li>State of the art cable wrap systems with ample space for customer cables</li> </ul>
<b>Optional</b>	<ul style="list-style-type: none"> <li>Platform with staircase and hoist</li> <li>De-icing system</li> <li>Environmentally controlled hub</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 provided computer software application or via a customer interface.

### Mechanical performance

<b>Pointing accuracy</b>	• 0.022°
<b>Speed</b>	<ul style="list-style-type: none"> <li>up to 12°/s in azimuth</li> <li>up to 6°/s in elevation</li> </ul>
<b>Acceleration</b>	• 3°/s <sup>2</sup> in both axes
<b>Travel range</b>	<ul style="list-style-type: none"> <li>±270° in azimuth (540° continuous)</li> <li>0°-90° in elevation</li> </ul>
<b>Drives</b>	• Dual torque biased backlash-free in both axes

### Power

<b>Drive systems</b>	• 380 to 480VAC 50/60Hz 3-phase
<b>De-icing system</b>	• 208/220 3-phase
<b>Auxiliary circuits</b>	<ul style="list-style-type: none"> <li>208VAC split phase 60Hz</li> <li>220VAC single phase 50Hz (optional)</li> </ul>

### Optional frequency bands

- Supports single, dual, and multi-band feeds, e.g., S to Ka, S/X, C/Ku, X/Ku, X/Ka, Ku/Ka, etc.
- CP and LP Broadband feed options available

### Tracking options

- Multiple open and closed loop tracking options include: Program track, NORAD TLE, IESS-412, Monopulse (optional), Step Track (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, up to 100 kph gusting (62 mph gusting)</li> <li>Survival, up to 200 km/hr (125 mph) in stow position wind</li> <li>Drive-to-stow wind, 125 kph (77 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 40ft containers.
- Rapid deployment, assembly, and commissioning at customer site.

## 15m Ka-band performance

	Rx	Tx
Frequency (GHz)	17.70 - 21.50	27.50 - 31.00
Feed ports	2 + 2 Monopulse	2
Antenna gain	68.0 dBi @21.5 GHz	70.6 dBi @31GHz
Beamwidth @ -3dB	0.07°	0.05°
G/Ts at Clear Sky with 120 K LNA @ 20° Elevation		
17.70 GHz	43.4 dB/K	
19.60 GHz	44.1 dB/K	
21.50 GHz	44.3 dB/K	
Power handling, per port (CW)		650 W
VSWR (Feed interface)	1.25	1.25
Cross pol isolation	32.78 dB	32.78 dB
Port to port isolation Rx → Tx, Tx → Rx	85 dB	85 dB
Port to port isolation Rx → Rx, Tx → Tx	20 dB	20 dB
Sidelobes	Meets ITU-RS-580-6	Meets ITU-RS-580-6

## 15m Ku-band performance

	Rx	Tx
Frequency (GHz)	10.70 – 12.75	12.70 – 14.50
Feed ports	2 + 2 Monopulse	2
Antenna gain	63.7 dBi @12.75 GHz	64.9 dBi @14.50 GHz
Beamwidth @ -3dB	0.12°	0.11°
G/Ts at Clear Sky with 59 K LNA @ 20° Elevation		
10.70 GHz	41.4 dB/K	
11.75 GHz	42.2 dB/K	
12.75 GHz	42.8 dB/K	
Power handling, per port (CW)		1.5 KW
VSWR (Feed interface)	1.25	1.25
Cross pol isolation	35 dB	35 dB
Port to port isolation Rx → Tx, Tx → Rx	85 dB	85 dB
Port to port isolation Rx → Rx, Tx → Tx	35 dB	35 dB
Sidelobes	Meets ITU-RS-580-6	Meets ITU-RS-580-6

## 15m X-band performance

	Rx	Tx
Frequency (GHz)	7.25 – 7.75	7.90 – 8.40
Feed ports	2 + 2 Monopulse	2
Antenna gain	55.5 dBi @7.75 GHz	60.2 dBi @8.40 GHz
Beamwidth @ -3dB	0.19°	0.18°
G/Ts at Clear Sky with 50 K LNA @ 10° Elevation		
7.25 GHz	38.6 dB/K	
7.50 GHz	38.9 dB/K	
7.75 GHz	39.1 dB/K	
Power handling, per port (CW)		2 KW
VSWR (Feed interface)	1.30	1.30
Cross pol isolation	32.78 dB	32.78 dB
Port to port isolation Rx → Tx, Tx → Rx	85 dB	85 dB
Port to port isolation Rx → Rx, Tx → Tx	18 dB	18 dB
Sidelobes	Meets ITU-RS-580-6	Meets ITU-RS-580-6

## 15m C-band performance

	Rx	Tx
Frequency (GHz)	3.400 – 4.200	5.725 – 6.725
Feed ports	2	2
Antenna gain	54.5 dBi @4.200 GHz	58.5 dBi @6.725 GHz
Beamwidth @ -3dB	0.38°	0.23°
G/Ts at Clear Sky with 30 K LNA @ 20° Elevation		
3.400 GHz	33.4 dB/K	
3.800 GHz	34.4 dB/K	
4.200 GHz	35.2 dB/K	
Power handling, per port (CW)		2.5 KW
VSWR (Feed interface)	1.25	1.25
Cross pol isolation	32.78 dB	32.78 dB
Port to port isolation Rx → Tx, Tx → Rx	85 dB	85 dB
Port to port isolation Rx → Rx, Tx → Tx	20 dB	20 dB
Sidelobes	Meets ITU-RS-580-6	Meets ITU-RS-580-6

## 15m S-band performance

	Rx	Tx
Frequency (GHz)	2.170 – 2.300	1.980 – 2.120
Feed ports	2	2
Antenna gain	49.2 dBi @2.300 GHz	48.5 dBi @2.120 GHz
Beamwidth @ -3dB	0.65°	0.71°
G/Ts at Clear Sky with 45 K LNA @ 20° Elevation		
2.170 GHz	28.6 dB/K	
2.235 GHz	28.8 dB/K	
2.300 GHz	29.1 dB/K	
Power handling, per port (CW)		5 KW
VSWR (Feed interface)	1.25	1.25
Cross pol isolation	32.78 dB	32.78 dB
Port to port isolation Rx → Tx, Tx → Rx	85 dB	85 dB
Port to port isolation Rx → Rx, Tx → Tx	20 dB	20 dB
Sidelobes	Meets ITU-RS-580-6	Meets ITU-RS-580-6

