

# 7m Satcom antenna

The Calian 7m Satcom antenna combines high accuracy, high efficiency Cassegrain optics with precision motion control systems to accurately track GEO and MEO satellites. Precision bearings and dual-drives in the azimuth axis ensure the stiff structure necessary for precise tracking in higher frequency systems—such as Ka-band. This design approach combined with advanced manufacturing techniques results in a major step forward in affordable precision antenna design. Several different feeds can be fitted to support your band of operation. Calian's experience in ground station system engineering and integration has been incorporated into making this product better suited to a terminal or gateway application; examples include ease of maintenance for mechanical components and a hub designed to support a higher level of integration.

## Specifications

### General configuration

Configuration	<ul style="list-style-type: none"> <li>Dual reflector Cassegrain design</li> <li>2 axis motion, elevation over azimuth</li> </ul>
Main reflector	<ul style="list-style-type: none"> <li>7m diameter</li> <li>Precision formed aluminum</li> <li>Surface accuracy &lt; 0.008" RMS</li> </ul>
Sub reflector	<ul style="list-style-type: none"> <li>High accuracy composite</li> <li>Surface accuracy &lt; 0.002" RMS</li> </ul>
Hub	<ul style="list-style-type: none"> <li>6–8 ft. diameter for RF equipment integration available upon request</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>Environmentally controlled hub</li> <li>Adjustable polarization</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

Pointing accuracy • < 0.013°

Tracking accuracy • < 0.0055°

Speed • 1°/s in azimuth  
• 0.5°/s in elevation

Acceleration • 0.5°/s<sup>2</sup> in both axes

Travel range • Up to 400° in azimuth  
• 0°–90° in elevation

Drives • Dual torque biased in azimuth  
• Precision jack drive in elevation

### Power

Drive systems • 200 to 240VAC or 380 to 430VAC  
50/60Hz 3-phase

De-icing system • 208/220 3-phase

Auxiliary circuits • 208VAC split phase 60 Hz  
• 220VAC single phase 50 Hz (optional)

### 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, and step track



## 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) in stow position</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 Monopulse	2 CP
Antenna Gain @ mid band	60.8 dBi	64.1 dBi
Beamwidth @ -3dB	0.15°	0.11°
G/Ts at Clear Sky @ 20° Elevation		
17.70 GHz	37.1 dB/K <sup>*1</sup>	
19.60 GHz	37.6 dB/K <sup>*1</sup>	
21.50 GHz	37.8 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.