

# 15m High-Performance Antenna

The Calian 15m high-performance antenna is 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

- Configuration: Dual reflector Cassegrain design  
2 axis motion, elevation over azimuth
- Main reflector: 15m diameter  
Precision formed aluminum  
Surface accuracy below 0.008" RMS
- Sub reflector: High accuracy composite  
Surface accuracy below 0.002" RMS
- Hub: Up to 10 ft/3.05m diameter for RF equipment integration
- Pedestal: State-of-the-art cable wrap systems with ample space for customer cables.
- Optional: Platform with staircase and hoist  
De-icing system  
Environmentally controlled hub  
Adjustable polarization

### 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: 0.005°
- Speed: up to 10°/s in azimuth  
up to 6°/s in elevation
- Acceleration: 3°/s<sup>2</sup> in both axis
- Travel range: ±270° in azimuth (540° continuous)  
0°-90° in elevation
- Drives: Dual torque biased backlash-free drives in both axes

### Power

- Drive Systems: 480VAC 50/60Hz 3-phase
- De-icing System: 208/220 3 phase
- Auxiliary Circuits: 208VAC split phase 60 Hz  
220VAC single phase 50 Hz (optional)

### Feed

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

### Tracking

- Multiple open and closed loop tracking options include: track, NORAD TLE, IESS-412, Monopulse (optional), Step Track (optional)





## Environmental Performance

Temperature:	Operational -30 to +60 °C Survival -40 to +70 °C
Seismic:	0.3g horizontal and vertical
Wind speed:	Operational, up to 100 kph gusting (62 mph gusting) Survival, up to 200 km/hr (125 mph) in stow position wind Drive-to-stow wind, 125 kph (77 mph)
Humidity:	0 to 100% with condensation
Ice Accumulation:	30mm thick on all exposed surfaces
Corrosion:	Galvanized ASTM-A123, stainless and galvanized fasteners, multi-layer epoxy-based paint.

## Shipping Configuration and Features

Modular design to allow for easy shipping in standard 40ft 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	2CP + 2 Monopulse	2CP
Antenna Gain	68.5 dBi @21.5 GHz	71.1 dBi @31 GHz
Beamwidth @ -3dB	0.07°	0.05°
G/Ts at Clear Sky with 120 K LNA @ 20° Elevation		
17.70 GHz	43.9 dB/K	
19.60 GHz	44.6 dB/K	
21.50 GHz	44.8 dB/K	
Power handling, per port (CW)	500 watts	500 watts
VSWR (Feed interface)	1.25	1.25
Cross Pol Isolation (Axial Ratio)	32.78 dB (1.047)	32.78 dB (1.047)
Port to Port Isolation $R_x \rightarrow T_x, T_x \rightarrow R_x$	85 dB	85 dB
Port to Port Isolation $R_x \rightarrow R_x, T_x \rightarrow T_x$	20 dB	20 dB
Sidelobes	Meets ITU-R S-580-6	Meets ITU-R S-580-6

## Ku-band Performance

	Rx	Tx
Frequency (GHZ)	10.70 – 12.75	12.70 – 14.50
Feed Ports	2LP + 2 Monopulse	2LP
Antenna Gain	64.2 dBi @12.75 GHz	65.4 dBi @14.50 GHz
Beamwidth @ -3dB	0.12°	0.11°
G/Ts at Clear Sky with 59 K LNA @ 20° Elevation		
10.70 GHz	41.87 dB/K	
11.75 GHz	42.60 dB/K	
12.75 GHz	43.26 dB/K	
Power handling, per port (CW)	500 watts	500 watts
VSWR (Feed interface)	1.25	1.25
Cross Pol Isolation	35 dB	35 dB
Port to Port Isolation $R_x \rightarrow T_x$ , $T_x \rightarrow R_x$	85 dB	85 dB
Port to Port Isolation $R_x \rightarrow R_x$ , $T_x \rightarrow T_x$	35 dB	35 dB
Sidelobes	Meets ITU-R S-580-6	Meets ITU-R S-580-6

## X-band Performance

	Rx	Tx
Frequency (GHZ)	7.25 – 7.75	7.90 – 8.40
Feed Ports	2CP + 2 Monopulse	2CP
Antenna Gain	60.0 dBi @7.75 GHz	60.7 dBi @8.40 GHz
Beamwidth @ -3dB	0.19°	0.18°
G/Ts at Clear Sky with 50 K LNA @ 10° Elevation		
7.25 GHz	39.07 dB/K	
7.50 GHz	39.36 dB/K	
7.75 GHz	39.64 dB/K	
Power handling, per port (CW)	500 watts	500 watts
VSWR (Feed interface)	1.30	1.30
Cross Pol Isolation (Axial Ratio)	32.78 dB (1.047)	32.78 dB (1.047)
Port to Port Isolation $R_x \rightarrow T_x$ , $T_x \rightarrow R_x$	85 dB	85 dB
Port to Port Isolation $R_x \rightarrow R_x$ , $T_x \rightarrow T_x$	18 dB	18 dB
Sidelobes	Meets ITU-R S-580-6	Meets ITU-R S-580-6

## C-band Performance

	Rx	Tx
Frequency (GHZ)	3.400 – 4.200	5.725 – 6.725
Feed Ports	2CP + 2 Monopulse	2CP
Antenna Gain	55.0 dBi @4.200 GHz	59.0 dBi @6.725 GHz
Beamwidth @ -3dB	0.38°	0.23°
G/Ts at Clear Sky with 30 K LNA @ 20° Elevation		
3.400 GHz	33.91 dB/K	
3.800 GHz	34.87 dB/K	
4.200 GHz	35.73 dB/K	
Power handling, per port (CW)	5000 watts	5000 watts
VSWR (Feed interface)	1.25	1.25
Cross Pol Isolation (Axial Ratio)	32.78 dB (1.047)	32.78 dB (1.047)
Port to Port Isolation $R_x \rightarrow T_x, T_x \rightarrow R_x$	85 dB	85 dB
Port to Port Isolation $R_x \rightarrow R_x, T_x \rightarrow T_x$	20 dB	20 dB
Sidelobes	Meets ITU-R S-580-6	Meets ITU-R S-580-6

## S-band Performance

	Rx	Tx
Frequency (GHZ)	2.170 – 2.300	1.980 – 2.120
Feed Ports	2CP + 2 Monopulse	2CP
Antenna Gain	49.7 dBi @2.300 GHz	49.0 dBi @2.120 GHz
Beamwidth @ -3dB	0.65°	0.71°
G/Ts at Clear Sky with 45 K LNA @ 20° Elevation		
2.170 GHz	29.06 dB/K	
2.235 GHz	29.32 dB/K	
2.300 GHz	29.57 dB/K	
VSWR (Feed interface)	1.25	1.25
Cross Pol Isolation (Axial Ratio)	32.78 dB (1.047)	32.78 dB (1.047)
Port to Port Isolation $R_x \rightarrow T_x, T_x \rightarrow R_x$	85 dB	85 dB
Port to Port Isolation $R_x \rightarrow R_x, T_x \rightarrow T_x$	20 dB	20 dB
Sidelobes	Meets ITU-R S-580-6	Meets ITU-R S-580-6

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