CALIAN
Confidence. Engineered.

3m–5m 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

Configuration	• Dual reflector Cassegrain design • 2 axis motion, elevation over azimuth
Main reflector	• 3 - 5m diameter • Precision formed aluminum • Surface accuracy < 0.008" RMS
Sub reflector	• High accuracy construction
Hub	• 2 ft. diameter with additional RF equipment mounting provisions
Pedestal	• High stiffness reinforced pedestal
Optional	• 4 ft. diameter hub for internal RF equipment integration • De-icing system • Active 3rd Axis

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	• < 0.018°
Tracking accuracy:	• < 0.0082°
Speed	• up to 12°/s in azimuth • up to 12°/s in elevation
Acceleration:	• up to 6°/s^2 in azimuth
Travel range	• ±270° in azimuth (540° continuous) • 0° - 90° in elevation
Tilt	• Active or Fixed Tilt (up to 8.5°)
Drives	• Dual torque biased backlash-free drives in both axes

Power

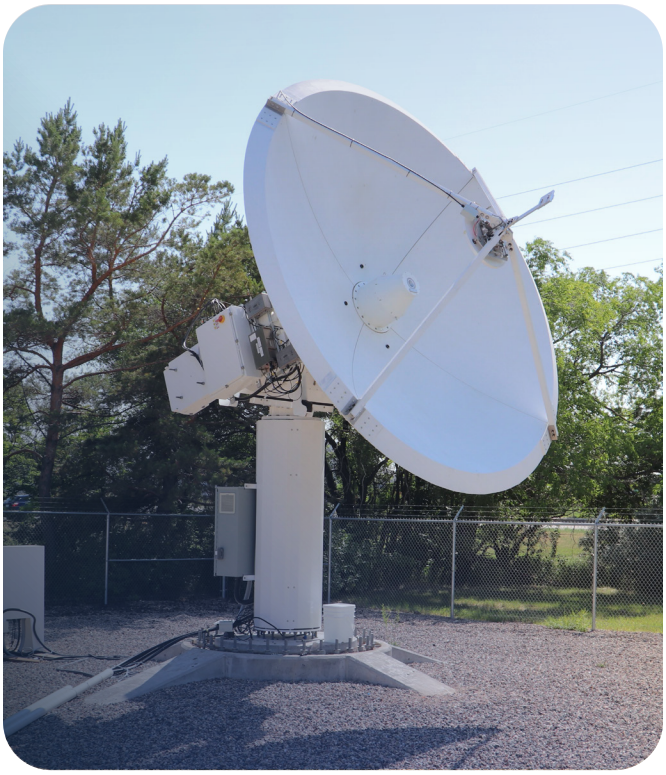
Drive systems	• 200 to 240VAC and 380 to 430VAC 3–phase, frequency 50/60Hz
De-icing system	• 208/220 3–phase
Auxiliary circuits:	• 208VAC split phase 60 Hz • 220VAC single phase 50 Hz (optional)

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 (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 72kph (45mph) Gusting up to 100 kph (62 mph) • Survival, 200 kph (125 mph) in stow position
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 containers or crates
- Rapid deployment, assembly, and commissioning at customer site

4m Ka-band performance

	Rx	Tx
Frequency (GHz)	17.70 - 21.50	27.50 - 31.00
Feed ports	2*	2
Antenna gain	56.8 dBi @21.5 GHz	59.9 dBi @31 GHz
Beamwidth @ -3dB	0.28°	0.19°
G/Ts at Clear Sky with 120 K LNA @ 20° Elevation		
17.70 GHz	31.1 dB/K	
19.60 GHz	32.9 dB/K	
21.50 GHz	33.1 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

*Additional tracking ports available

4m Ku-band performance

	Rx	Tx
Frequency (GHz)	10.70 – 12.75	12.70 – 14.50
Feed ports	2	2
Antenna gain	52.2 dBi @12.75 GHz	53.5 dBi @14.50 GHz
Beamwidth @ -3dB	0.47°	0.40°
G/Ts at Clear Sky with 59 K LNA @ 20° Elevation		
10.70 GHz	29.8 dB/K	
11.75 GHz	30.6 dB/K	
12.75 GHz	31.3 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-R S-580-6	Meets ITU-R S-580-6

4m X-band performance

	Rx	Tx
Frequency (GHz)	7.25 – 7.75	7.90 – 8.40
Feed ports	2	2
Antenna gain	48.0 dBi @7.75 GHz	48.7dBi @8.40 GHz
Beamwidth @ -3dB	0.73°	0.67°
G/Ts at Clear Sky with 50 K LNA @ 10° Elevation		
7.25 GHz	27.0 dB/K	
7.50 GHz	27.3 dB/K	
7.75 GHz	27.6 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-R S-580-6	Meets ITU-R S-580-6

4m C-band performance

	Rx	Tx
Frequency (GHz)	3.400 – 4.200	5.725 – 6.725
Feed ports	2	2
Antenna gain	42.9 dBi @4.200 GHz	47.0 dBi @6.725 GHz
Beamwidth @ -3dB	1.44°	0.88°
G/Ts at Clear Sky with 30 K LNA @ 20° Elevation		
3.400 GHz	21.8 dB/K	
3.800 GHz	22.8 dB/K	
4.200 GHz	23.7 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-R S-580-6	Meets ITU-R S-580-6

4m S-band performance

	Rx	Tx
Frequency (GHz)	2.170 – 2.300	1.980 – 2.120
Feed ports	2	2
Antenna gain	37.7 dBi @2.300 GHz	37.0 dBi @2.120 GHz
Beamwidth @ -3dB	2.44°	2.66°
G/Ts at Clear Sky with 45 K LNA @ 20° Elevation		
2.170 GHz	17.0 dB/K	
2.235 GHz	17.2 dB/K	
2.300 GHz	17.5 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→Rx, Tx→Tx	85 dB	85 dB
Port to port isolation Rx→Rx, Tx→Tx	20 dB	20 dB
Sidelobes	Meets ITU-R S-580-6	Meets ITU-R S-580-6

*Additional tracking ports available

CALIAN
Confidence. Engineered.

calian.com/products/**antenna-systems**
For more information, contact: antennas@calian.com