CALIAN
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7m High-Performance Antenna

The Calian 7m 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	• 7m diameter • Precision formed aluminum • Surface accuracy < 0.008" RMS
Sub reflector	• High accuracy composite • Surface accuracy < 0.002" RMS
Hub	• 6 ft. diameter with additional RF equipment mounting provisions
Pedestal	• State-of-the-art cable wrap systems with ample space for customer cables.
Optional	• 8 ft. diameter hub for internal RF equipment integration De-icing system • Environmentally controlled hub 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	• < 0.013°
Tracking accuracy	• < 0.0055°
Speed	• up to 15°/s in azimuth • up to 15°/s in elevation
Acceleration	• up to 15°/s^2 in both axis
Travel range	• ±270° in azimuth (540° continuous) • 0°-180° in elevation
Tilt options	• Active or Fixed Tilt (up to 8.5°)
Drives	• Dual torque biased backlash-free drives in both axes

Power

Drive systems	• 208VAC 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, 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
- 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	2
Antenna gain	62.02 dBi @21.5 GHz	64.5 dBi @31 GHz
Beamwidth @ -3dB	0.16°	0.11°
G/Ts at Clear Sky with 120 K LNA @ 20° Elevation		
17.70 GHz	36.9 dB/K	
19.60 GHz	37.6 dB/K	
21.50 GHz	37.9 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-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	2	2
Antenna gain	57.1 dBi @12.75 GHz	58.4 dBi @14.50 GHz
Beamwidth @ -3dB	0.27°	0.23°
G/Ts at Clear Sky with 59 K LNA @ 20° Elevation		
10.70 GHz	34.7 dB/K	
11.75 GHz	35.5 dB/K	
12.75 GHz	36.2 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

X-band performance

	Rx	Tx
Frequency (GHz)	7.25 – 7.75	7.90 – 8.40
Feed ports	2	2
Antenna gain	52.9 dBi @7.75 GHz	53.6 dBi @8.40 GHz
Beamwidth @ -3dB	0.42°	0.38°
G/Ts at Clear Sky with 50 K LNA @ 10° Elevation		
7.25 GHz	31.9 dB/K	
7.50 GHz	32.2 dB/K	
7.75 GHz	32.5 dB/K	
Power handling, per port (CW)		2 KW
VSWR (Feed interface)	1.30	1.30
Cross Pol Isolation (Axial Ratio)	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

C-band performance

	Rx	Tx
Frequency (GHz)	3.400 – 4.200	5.725 – 6.725
Feed ports	2	2
Antenna gain	47.8 dBi @4.200 GHz	51.9 dBi @6.725 GHz
Beamwidth @ -3dB	0.82°	0.50°
G/Ts at Clear Sky with 30 K LNA @ 20° Elevation		
3.400 GHz	26.7 dB/K	
3.800 GHz	27.7 dB/K	
4.200 GHz	28.6 dB/K	
Power handling, per port (CW)		2.5 KW
VSWR (Feed interface)	1.25	1.25
Cross Pol Isolation (Axial Ratio)	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

S-band performance

	Rx	Tx
Frequency (GHz)	2.170 – 2.300	1.980 – 2.120
Feed ports	2	2
Antenna gain	42.6 dBi @2.300 GHz	41.9 dBi @2.120 GHz
Beamwidth @ -3dB	1.40°	1.52°
G/Ts at Clear Sky with 45 K LNA @ 20° Elevation		
2.170 GHz	21.9 dB/K	
2.235 GHz	22.2 dB/K	
2.300 GHz	22.4 dB/K	
Power handling, per port (CW)		5 KW
VSWR (Feed interface)	1.25	1.25
Cross Pol Isolation (Axial Ratio)	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

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