CALIAN®
Confidence. Engineered.

7m LEO Earth station antenna

The Calian 7m LEO Earth station antenna combines high accuracy, high efficiency Cassegrain optics with high-speed slewing to track faster targets, including LEO and MEO satellites. The third tilt axis ensures uninterrupted tracking through overhead passes. 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	• Dual reflector Cassegrain design • 3 axis motion (no keyhole), elevation over azimuth, with tilt
Main reflector	• 9.2m diameter • Precision formed aluminum • Surface accuracy < 0.008" RMS
Sub reflector	• High accuracy composite • Surface accuracy < 0.002" RMS
Hub	• 6–8 ft. diameter for RF equipment integration available upon request
Pedestal	• State of the art cable wrap systems with ample space for customer cables
Optional	• De-icing system • Environmentally controlled hub

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°– 90° 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	• 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, and step track

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	2 + 2 Monopulse	2
Antenna gain	61.6 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	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	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	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