Datasheet

CALIAN®
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4m LEO Earth Station antenna

The Calian 4m LEO Earth Station antenna system provides high accuracy, high efficiency Cassegrain optics and high-speed slewing making it suitable for tracking faster targets, including low-earth-orbit (LEO) and medium-earth-orbit (MEO). The optional 3rd tilt axis ensures uninterrupted tracking over the keyhole. The use of advanced manufacturing techniques results in a major step forward in affordable precision antenna design.

The antenna can be fitted with several different feeds to support your application. Our ground station integration experience in the satellite industry means this antenna is designed to meet the needs of your network.

Specifications

General configuration

Configuration	• Dual reflector Cassegrain design
Main reflector	• 4m diameter • Precision formed aluminum • Surface accuracy < 0.010" RMS
Sub reflector	• High surface accuracy construction
Mounting	• Counterweight arms with mounting frames for minimum of 500 lbs. of RF equipment placement or as needed
Pedestal	• High stiffness reinforced pedestal
Optional	• De-icing system • Adjustable polarization • Fixed 3rd axis • 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 web GUI application or via a customer interface

Mechanical performance

Pointing accuracy	• < 0.018°
Speed	• Up to 15°/s in azimuth • Up to 15°/s in elevation
Acceleration	• Up to 15°/s^2 in both axes
Travel range	• ±270° in azimuth (540° continuous) • 0°- 90° in elevation
Axis configuration 1	• ±270° in azimuth (540° continuous) • 0°- 90° in elevation
Axis configuration 2	• Three axis motion, no keyhole • Elevation over azimuth, with 7° tilt
Drives	• Dual torque biased backlash-free drives in all axes

Power

Drive systems	• 380 to 480VAC 50/60Hz 3-phase or 200 to 240VAC 50/60Hz 3-phase
De-icing system	• 208VAC 60Hz 3-phase or 400VAC 50Hz 3-phase
Auxiliary circuits	• 208/120VAC 60Hz or 230VAC single phase 50Hz

Optional frequency bands

- Supports single, dual, tri-band feeds, S to Ka
- CP and LP broadband feed options available

Tracking options

Multiple open and closed loop tracking options include:

- Program track
- NORAD TLE
- Step Track (optional)
- Monopulse (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)
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 CP	2 CP
Antenna Gain @ mid band	56.1 dBi	59.4 dBi
Beamwidth @ -3dB	0.22°	0.16°
G/Ts at Clear Sky @ 20° Elevation		
17.70 GHz	32.4 dB/K *1	
19.60 GHz	33.0 dB/K *1	
21.50 GHz	33.3 dB/K *1	
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	

*1 The G/T is evaluated with a 110K LNA bolted at the feed interface.

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calian.com/space/antennas
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