Datasheet

CALIAN®
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7.3m S/X/Ka Earth Observation Antenna

The Calian 7.3 m Antenna System is designed for demanding Earth observation and remote-sensing applications, combining high-efficiency optics with high-speed, high-accuracy tracking performance. Its precision drive system enables rapid acquisition and continuous tracking of low-Earth-orbit (LEO) and medium-Earth-orbit (MEO) spacecraft, supporting reliable reception of high-volume Earth observation data during relatively short satellite passes. For missions requiring full-sky coverage, an optional third tilt axis enables uninterrupted tracking through the zenith keyhole, maximizing usable contact time and helping ensure complete data capture during high-elevation passes.

The antenna can be configured with a range of feed and RF systems to support mission-specific Earth observation requirements, including high-data-rate payload downlinks and multi-band ground station architectures. Drawing on Calian's extensive experience in satellite ground-station design and integration, the 7.3 m platform provides a reliable, high-performance solution for satellite imagery, environmental monitoring, climate observation, mapping, disaster response, and other remote-sensing missions.

Specifications

General configuration

Configuration	• Dual reflector design
Main reflector	• 7.3m diameter • Precision formed aluminum • Surface accuracy < 0.010" RMS
Sub reflector	• High surface accuracy construction
Hub	• Variable size hub for RF equipment integration available upon request
Pedestal	• High stiffness reinforced pedestal
Optional	• De-icing system • 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

Tracking accuracy	• 0.01
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°- 180° in elevation
Axis configuration 1	• Two axis motion • Elevation over azimuth
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: 72km/h (45mph) • Gusts: 100 km/h (63 mph) • Survival: 200 km/h (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

S/X/Ka-band performance

	S-band		X-band	Ka-band
	Tx	Rx	Rx	Rx
Frequency (GHz)	2.025 - 2.120	2.200 - 2.300	7.750 - 8.500	25.500 - 27.000
Feed Ports	2	2 + 2 Monopulse	2 + 2 Monopulse	2 + 2 Monopulse
Antenna Gain @ mid band	40.5 dBi	41.2 dBi	53.5 dBi	63.0 dBi
Beamwidth @ -3dB	1.3°	1.4°	0.34°	0.11°
G/Ts @ 10° Elevation				
Low band	-	19.5 dB/K *1	32.3 dB/K *2	38.0 dB/K *3
Mid band	-	19.9 dB/K *1	32.5 dB/K *2	38.4 dB/K *3
High band	-	20.1 dB/K *1	32.7 dB/K *2	38.6 dB/K *3
Power handling (CW)	500 W	-	-	-
VSWR (Feed interface)	1.40:1	1.40:1	1.40:1	1.30:1
Axial Ratio	1.50	1.50	1.50	1.50
Port to Port isolation Rx → Tx, Tx → Rx	85 dB			
Port to Port isolation Rx → Rx, Tx → Tx	16 dB			
Sidelobes	Meets ITU-R S-580-6			

*1 The G/T is evaluated with a 28K LNA bolted at the feed interface.
*2 The G/T is evaluated with a 42K LNA bolted at the feed interface.
*3 The G/T is evaluated with a 150K LNA bolted at the feed interface.

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