CALIAN®
Confidence. Engineered.

12m–15m Radio Telescopes

Calian Radio Telescopes have been used by NASA over the last decade for their VLBI program. They provide high accuracy, high efficiency Cassegrain optics and high-speed slewing systems. The use of advanced manufacturing techniques results in a major step forward in affordable precision antenna and telescope systems design. They offer exceptional pointing precision and reflector surface accuracy, making them ideal for advanced VLBI, Scientific, Radar and other array applications. This antenna has been deployed widely and is field-proven. The antenna can be fitted with several different feeds to support your application. Our ground station integration experience in the scientific, radar and satellite industry means this antenna is designed to meet the needs of your network.

Specifications

General configuration

Configuration	• Dual reflector Cassegrain design • 2 axis motion, elevation over azimuth
Main reflector	• 12 - 15m diameter • Precision formed aluminum • Surface accuracy below 0.008" RMS
Sub reflector	• High accuracy composite • Surface accuracy below 0.002" RMS
Hub	• Up to 10 ft. diameter for RF equipment integration available upon request
Pedestal	• State of the art cable wrap systems with ample space for customer cables
Optional	• Platform with staircase and hoist • De-icing system • Environmentally controlled hub • Adjustable polarization

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	• < 0.005°
Speed	• up to 12°/s in azimuth • up to 6°/s in elevation
Acceleration	• 3°/s2 in both axis
Travel range	• ±270° in azimuth (540° continuous) 0°- 90° in elevation
Drives	• Dual torque biased backlash-free drives in both axes

Power

Drive systems	• 380 to 480VAC 50/60Hz 3-phase
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 100kph (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

12m antenna performance

	2 GHz	14 GHz	30 GHz
Feed ports	2	2	2
Antenna gain	45.9 dB	62.7 dB	68.9 dB
Beamwidth @ -3dB	0.91°	0.13°	0.06°
G/Ts at Clear Sky @ 20° Elevation	25.4 dB/K w/ 45K LNA	41.7 dB/K w/60K LNA	44.9 dB/K w/ 110K LNA
VSWR (Feed interface)	1.25	1.25	1.25
Cross pol isolation	32.78 dB	35 dB	32.78 dB
Port to port isolation Rx→Tx, Tx→Rx	85 dB	85 dB	85 dB
Port to port isolation Rx→Rx, Tx→Tx	20 dB	35 dB	18 dB
Sidelobes	Meets ITU-R S-580-6	Meets ITU-R S-580-6	Meets ITU-R S-580-6

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