Datasheet

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# 4m Q/V-Band LEO Earth Station antenna

The Calian 4m Q/V-Band 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<br>• 3 axis motion (no keyhole), elevation over azimuth, with Tilt |
| **Main reflector** | • 4m diameter<br>• High accuracy composite<br>• Surface accuracy < 0.008" RMS |
| **Sub reflector** | • High accuracy composite<br>• Surface accuracy < 0.002" RMS |
| **Hub** | • Up to 4 ft. diameter for RF equipment integration available upon request |
| **Pedestal** | • High stiffness reinforced pedestal |
| **Optional** | • De-icing system<br>• 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** | • < 0.018° |
| **Tracking accuracy:** | • < 0.0082° |
| **Speed** | • Up to 15°/s in azimuth<br>• Up to 15°/s in elevation |
| **Acceleration** | • Up to 15°/s$^2$ in both axis |
| **Travel range** | • ±200° in azimuth (400° continuous)<br>Up to 0°- 180° in elevation |
| **Tilt** | • 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<br>• 220VAC single phase 50 Hz (optional) |

### Optional frequency bands

- Supports circular polarized single, dual, tri-band feeds, e.g., S to V, S/X, C/Ku, X/Ku, Ku/Ka, Q/V, C/Ku/Ka, Ka/Q/V, etc.

### 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<br>• Survival -40 to +70 °C |
| **Seismic** | • 0.3g horizontal and vertical |
| **Wind speed** | • Operational 72kph (45mph) Gusting up to 100kph (62 mph)<br>• 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 or crates
- Rapid deployment, assembly, and commissioning at customer site

## Q-V-band performance

| | Rx | Tx |
|---|---|---|
| Frequency (GHz) | 37.50 – 42.50 | 47.20 – 52.40 |
| Feed ports | 2CP + 2 Monopulse | 2CP |
| Antenna gain | Typical 62.20 dBi @42.50 GHz | Typical 63.64 dBi @52.40 GHz |
| Beamwidth @ -3dB | 0.14° | 0.11° |
| G/Ts at Clear Sky with 250 K LNA @ 20° Elevation | | |
| 37.70 GHz | 34.20 dB/K | |
| 40.00 GHz | 34.63 dB/K | |
| 42.50 GHz | 35.00 dB/K | |
| EIRP with 250W HPA | | Typical 81.34 dBW @ 52.40 GHz |
| Power handling, per port (CW) | | 250 watts |
| VSWR (Feed interface) | 1.25 | 1.25 |
| Cross pol isolation | 30.85 dB | 30.85 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 | Meets ITU-R S-580-6 |

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