

1.8AEBP-1.8m Elevation-Over-Azimuth Antenna Positioner

Suitable for 1.8m antenna systems operating in X, S, and L Band applications

The Orbital System's 1.8AEBP-1.8m antenna is designed and built to provide high reliability while withstanding severe environmental conditions. A high-quality, high-precision, elevation-over-azimuth satellite tracking system suitable for X, S, and L Band operation. Utilizing the proven Orbital Data Bus (ODB) technology to provide integrated control of the antenna positioner and RF payload. Superior engineering, precision manufacturing, and strict quality control standards result in maintenance-free operations making the 1.8AEBP-1.8m system the optimal choice for service in remote locations and hostile climates.

Features

Equipped with a high-quality 1.8 meter reflector, brushless servomotors, sealed gears, built-in programmable tracking controller with internal GPS receiver, and a complete tool kit. The 1.8AEBP positioner features unlimited azimuth rotation using gold-on-gold contact slip rings and a single channel rotary joint with a frequency of zero to four (0 to 4) GHz. Controlled remotely using 100BASE-FX fiber optic Ethernet. Reception loss caused by what is sometimes called a "keyhole effect" is eliminated by the high speed of azimuth rotation in Orbital Systems' two axis products. When tracking a near overhead pass the antenna uses a predictive motion with a peak azimuth velocity of 60 degrees/sec, and acceleration at up to 60 degrees/sec². These very high speeds serve to reduce loss of signals on a worst case near overhead pass.

System Control and Tracking

- ACU-2 antenna control unit is standard and enables flexible control options
- Tracks satellites at X Band and below without keyhole effect
- Customized controller interface options are available

Motors and Gears

- Mechanical system components are fully integrated with IP65-rated brushless servomotors and integrated brakes, matched and tuned motor drives, and heavy duty gears
- Gears are automatically heated to achieve optimal performance at temperatures as low as minus 40 degrees Celsius (-40°C)
- Gears are completely enclosed in a cast housing operating inside a regulated, optimal environment to increase their service life; no annual lubrication required

Pressurization

- Antenna positioner and feed are sealed and pressurized with dehydrated air or nitrogen to prevent corrosion of the internal components
- Dry air is supplied using conventional transmission line dehydrator technology
- Temperature and humidity sensors in the electrical cabinet, gear enclosure, and feed; the antenna control unit monitors these areas and automatically purges the system of moisture
- System continues to operate if pressurization fails

Reflectors and Feeds

- Supplied with a high quality 1.8 meter spun aluminum reflector
- Equipped with 4 feed support poles; RF data cable, dry air hose, and ODB run inside a pole for use with Orbital Systems' feeds
- Many feeds are available with optional downconverters and polarity switching
- Orbital Systems' feeds have a purge valve controlling internal system moisture levels
- Feed communication is integrated into the antenna control unit over Orbital Data Bus (ODB)
- Typical 1.8m X- and -L Band system performance is 22 dB/K and 6 dB/K, respectively

Special Order Options

- Mains A/C or D/C power supplied internally through antenna positioner for elevation arm-mounted electronics
- Gigabyte Ethernet supplied internally through antenna positioner
- Additional RF channels supplied internally through antenna positioner
- Additional data pairs supplied internally through antenna positioner
- Optical multi-mode fiber supplied internally through antenna positioner



Applications

The 1.8AEBP antenna positioner and its ancillary RF components are typically used for the following tracking applications:

- EOS-DB - Earth Observation Satellites - Direct Broadcast data tracking LEO and MEO satellites*
- TT&C - Telemetry, Tracking and Control
- RADAR for advanced meteorological and environmental analysis
- SARSAT - Search and Rescue reception of MEO satellites in S and L Bands
- UAS/UAV aircraft and missile tracking

*Reference EOS-DB data sheet for additional details

Specifications

X-Band LEO Tracking @ 1.8m Required

Continuous Capable

Azimuth Maximum Velocity.....	>48°/ sec	>50°/ sec
Azimuth Maximum Acceleration.....	>40°/ sec ²	>60°/ sec ²
Azimuth Peak Torque.....	>434 Nm (320 ft/lbs)	>488 Nm (360 ft/lbs)
Azimuth Maximum Travel.....	.....	Continuous Rotation
Elevation Maximum Velocity.....	9°/ sec	>50°/ sec
Elevation Maximum Acceleration	1°/ sec ²	>60°/ sec ²
Elevation Peak Torque	>434 Nm (320 ft/lbs)	>488 Nm (360 ft/lbs)
Elevation Maximum Travel.....	.....	194°
Brake Holding Torque.....	.....	>1235 Nm (910 ft/lbs)
Mechanical Total Tracking Accuracy .....	.....	±0.1°
Absolute Position Feedback Accuracy.....	.....	±0.02°

Electrical, Mechanical, and Environmental Specifications

Input Voltage, Frequency.....	100-120 or 200-245 VAC; 50/60 Hz Single Phase
Input Amperage.....	Typ 2A; Max 12A; Fuse at 20A (110V) or 15A (220V)
Operating Temperature.....	-40° C to +55° C
Continuous Wind Speed for Operational Tracking.....	88 k/hr (55 mph)
Maximum Wind Speed In Stow Position	200 k/hr (125 mph)
Non-Operating Maximum Rain Load.....	25 cm (10 inches) / hr
Maximum Ice Load	13mm (0.5 inches)
Positioner Weight	136 kg (300 lbs)
Safety, Emissions, and Machinery Directive Ratings	CE Marked; Tested by Independent Labs

Electrical Cabinet and External Controls

The electrical cabinet is equipped with the following safety devices:

- Emergency stop switch
- Audible warning annunciator
- Visual warning indicator
- Padlocks to lock the left and right sides of the electrical cabinet

1.8AEBP antenna positioners are compliant with CE Machinery Directive IEC 60204-1

