

18.3 m Dual Reflector Antenna



Features

High Gain Antenna's several types of 18 m antennas offer exceptional performances for TX/RX dual band and RX only multi band application for the frequencies of L- through Ka-bands (for GEO, MEO, LEO).

- Dual shaped high accuracy and strength formed reflectors
- Stiffness performance of antenna mount for required pointing accuracy for desired frequencies
- Excellent sidelobe performances and G/T
- Hot dipping galvanizing and zinc spraying treatments for surfaces of structural components

Options

- S, C, X, Ku, Ka band
- Dual or triple band simultaneous RX/TX system
- Multi band switching for RX feed system
- De-icing system (Heat blower)
- Solar isolation pedestal system
- Antenna Tracking System (Step, Mono-pulse, TLE, Memory, or Manual)
- Turnkey installation and testing
- Full motion or Limited motion
- HPA, LNA, D/C, U/C system integration in the equipment room

Electrical specifications

Electrical	S-Band		C-Band		X-Band		
Item	Receive	Transmit	Receive	Transmit	Receive		Transmit
Frequency (GHz)	2.20 ~ 2.30	2.025~ 2.12	3.40~ 4.80	5.85~ 6.72	7.90~ 8.50	7.25~ 7.75	7.90~ 8.40
Gain (Low frequency, dBi)	50.25	49.73	54.82	59.44	62.10	61.36	62.10
Typical G/T (10 ° EL)	29.4 dB/K (35 K LNA)	N/A	34.8 dB/K (30 K LNA)	N/A	41.4 dB/K (50 K LNA)	40.7 dB/K (50 K LNA)	N/A
Polarization	CP or LP		CP or LP		CP or LP		
Antenna noise temperature							
10°	51.56	N/A	41.12	N/A	44.47	43.81	N/A
15°	47.95	•	37.72	•	40.38	39.84	•
20°	45.37	•	34.97	•	37.08	36.64	•
30°	43.44	•	32.92	•	34.61	34.25	•
45°	42.20	•	31.60	•	33.01	32.70	•

Electrical	Ku-Band		K-Band			Ka-Band	
Item	Receive	Transmit	Receive			Receive	
Frequency (GHz)	10.70 ~ 12.70	13.0~ 14.75	17.08~ 18.60	18.80~ 20.2		17.80~ 19.30	25.50~ 27.00
Gain (Low frequency, dBi)	64.13	65.71	68.52	68.96		69.02	70.88
Typical G/T (10 ° EL)	42.1 dB/K (70 K LNA)		44.8 dB/K (100 K LNA)	45.0 dB/K (100 K LNA)		45.0 dB/K (100K LNA)	45.5 dB/K (120 K LNA)
Polarization	CP or LP		CP or LP			CP or LP	
Antenna noise temperature							
10°	55.52	N/A	78.37	89.21		71.62	128.97
15°	50.72	•	68.04	76.48		61.29	109.66
20°	46.83	•	59.48	65.80		52.73	92.84
30°	43.92	•	52.94	57.58		46.19	79.50
45°	42.03	•	48.65	52.15		41.90	70.52

* Gain values at feed flange

* G/T values at 10 ° elevation at clear weather of 18 °C temperature without RF interferences (wide open area)

18.3 m Dual Reflector Antenna

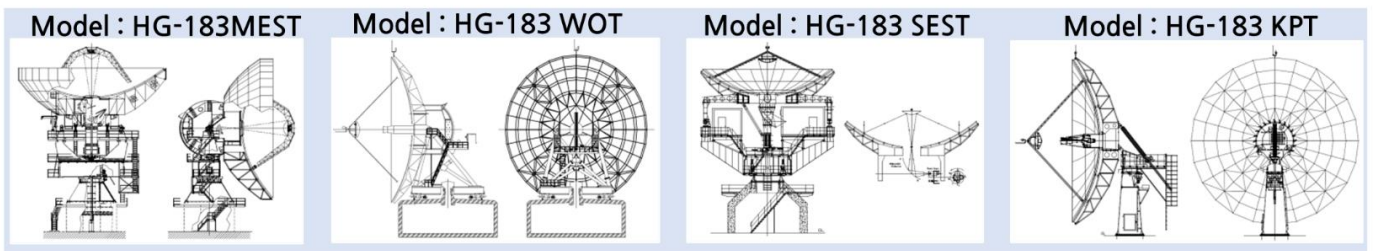
Mechanical specifications

Item	Specifications
Antenna type	Shaped dual reflectors
Pedestal type	Conical yoke tower (Options: Middle or side equipment room, wheel on track, or king post)
Reflector	Shaping formed aluminum panels, galvanized steel back-up structure
Pedestal configuration	Dual motor drive on AZ, EL axis (Single drive king post type pedestal) Options: Polarization motor drive on Pol. axis
Azimuth travel	$\pm 270^\circ$ or customized upon request
Elevation travel	0° to 90° continuous or customized for LEO, MEO, GEO applications
Azimuth , elevation travel rate	1° to $12^\circ/\text{sec}$
Foundation (L x W x D)	L , W = Antenna diameter * 0.71, D= Antenna diameter * 0.071
Soil bearing pressure	10,000 kg/m ²

Environmental specifications

Item	Specifications
Survival wind loading	60 m/sec
Operational wind loading	20 m/sec, gusting to 27 m/sec
Operational temperature	-20° to $+50^\circ\text{C}$
Survival temperature	-30° to $+60^\circ\text{C}$
Rain	Up to 100 mm/h
Relative humidity	0 ~ 100 %
Solar radiation	1000 kcal/h/m ²
Ice (Survival)	2.5 cm on all surface with 130 km/h wind gusts
Shock and vibration	As encountered during shipment by airplane, ship, or truck
Atmospheric conditions	As encountered in coastal regions and/or heavily industrialized areas
Seismic (Survival)	0.3 G's horizontal, 0.1 G's vertical

Basic 2D views



Middle equipment room slewing type

Wheel on track type

Side equipment room slewing type

King post slewing type

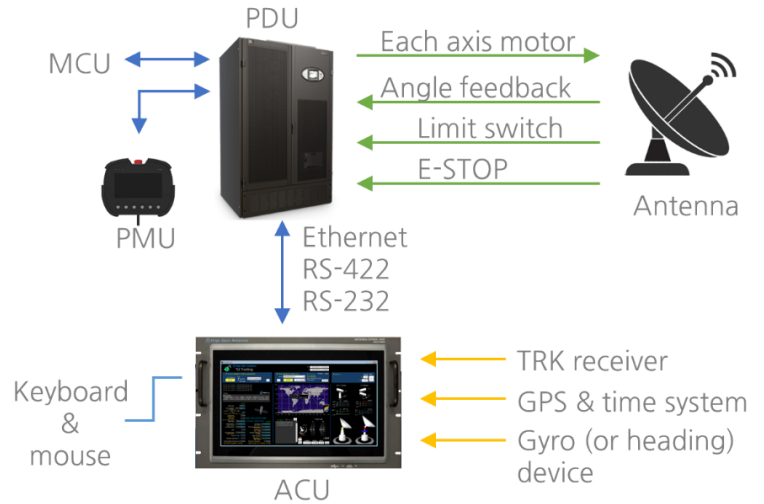
Antenna Controller Unit

HGA - ACU

ACU with 15.6" touch screen

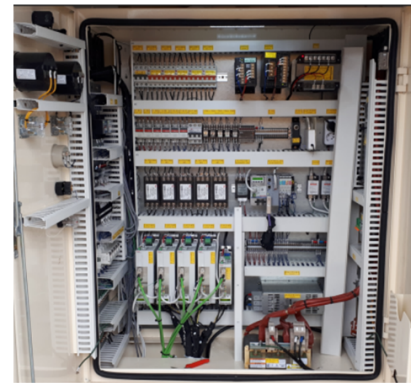


Block diagram



Features

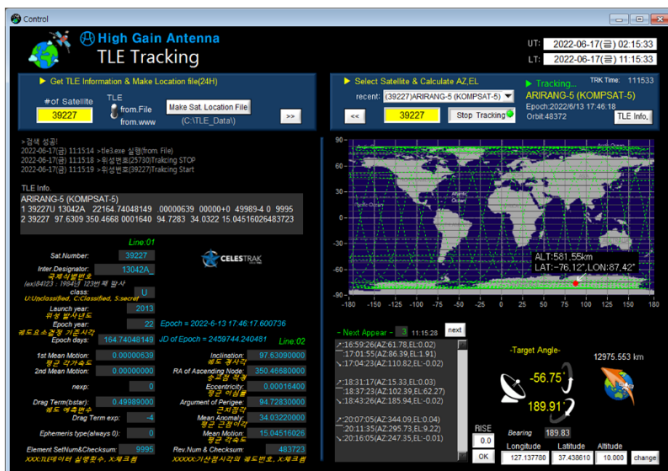
- Monitoring and controlling all functions of the antenna and interface devices
- Easy touch screen operation
- User friendly UI
- Step, Mono-pulse, Sun, Star, TLE track
- AZ/EL X-Y, AZ/EL/Tilt pedestals supported
- GEO, MEO, LEO applications



Pedestal drive unit

LEO tracking algorithm

- Using TLE (Two line element), calculate satellite position in real time
- Automatic search/acquisition of TLE data through the web (CELEStarck.com)
- Automatic TLE data save/update to local files
- High accuracy of low earth orbit satellite position calculation
- Low earth orbit satellite appearance time prediction
- Algorithm portability to ACU



HGA Low Earth Orbit Satellite Tracking GUI