



Gaia™ 100

S/X/Ka Tri-Band Support

LEO/MEO satellite tracking ground stations for
business and mission-critical applications





Gaia 100 Key Features

- Uninterrupted, complete horizon-to-horizon tracking
- Real 3-axis system – EL, Tilt and AZ – for greater availability and reliability
- Built-in, step-track-based Advanced Control Loop™, tracking for superior performance
- Innovative GaiaLink™ software, for ease of integration and operation
- Radome for anytime/anywhere operation
- Multiple frequency band combinations, including Tri-Band S/X/Ka to track any standard EO satellite (from L- to Ka-band) in a single platform
- Heavy duty operation
- Ground Station network integration
- Short lead time
- Mature product with multiple installations around the globe
- Torque-biased dual drive for high tracking accuracy

Make Your Data Count – Every Time

Earth Observation (EO) has become an essential part of our daily lives. The earth is constantly monitored, analyzed and measured by governmental agencies, defense forces and the private sector. From weather forecasting to disaster control, for oil and gas exploration and resource monitoring, earth observation data is vital to a growing body of applications that profoundly affects all of us.

New and growing constellations of Low Earth Orbit (LEO), Medium Earth Orbit (MEO) and Geostationary Orbit (GEO) satellites continuously circle our globe, providing visible imaging, radar screening and spectral analysis of our planet, as well as new communications services. To access data captured by these satellites, a fast and reliable communications link must be established between the moving satellites and the earth. Communication can only be established when there is a line of sight between the satellite and the ground station. For LEO satellites, this communications “time window” typically lasts only a few minutes, so the goal is to get the most out of it.

Important decisions depend on the reliability of such communications links and there are no second chances. Orbit’s LEO, MEO and GEO ground station solution for business- and mission-critical applications was designed to help ensure you never lose crucial data or connectivity.

Gaia 100 Series

Rethinking Ground Stations for EO and New Space

Combining years of experience and an extensive installed base with lessons from the emerging New Space sector, Orbit is rethinking traditional ground stations – making them more compact and cost-effective – to address the dynamic needs of its EO and NGSO constellation customers. The Gaia100 comprises cost-effective, high-performance tracking systems for reliable connectivity with LEO/MEO satellites.

The Gaia 100 family is available in 4 antenna sizes:



Ground Station as a Service ready

The following features makes the Gaia100 the optimal choice for GSaaS:

- Built for Heavy-duty operation
- Full hemispherical coverage with no “keyholes”
- Unmanned Remote operation
- EO frequency bands are supported, including Ka-Band
- SW ICD for external NMS integration
- Base-Band modem agnostic

Tracking Superiority

The combination of Orbit’s Advanced Control Loop™ algorithm and integrated RF tracking meets the demanding accuracy requirements of the Ka-band frequency range, ensuring that your ground station is ready for current and next-generation satellites.

Gaia100’s boresight pointing capability (the ability to pinpoint the center of a moving target) ensures maximum peak (G/T) reception performance while tracking the satellite, optimizing link performance and margins.

Variety of configurations

Gaia100 can be configured with a dual S&X-Band feed that supports simultaneous or switchable RHCP and LHCP polarization, with a S&Ka, Tri-Band S/X/Ka configuration or many additional combinations per the operator’s preferences. It typically uses X-Band or Ka-Band for downloading data from the satellite and S-band for the control and monitor management channel in both receive and transmit modes.

A single band feed is also available (in S-Band, X-Band or Ka-Band configurations). All antennas are designed to ensure continuous operation even when the LEO tracking path is at its zenith.

Monitoring and Control

Gaia100 earth stations employ an intuitive, user-friendly GaiaLink™ interface for overall management of system operations. The controller allocates antenna resources while managing tracking of LEO and MEO satellites.

GaiaLink Software Key Features

- Ability to monitor and control one or many ground stations at once
- Blockage zones management
- Advanced graphical user interface
- Secured SCP for host antenna file transfer (TLE, routing, scheduling, SW upgrades)
- Scheduler option for automatic “send & forget” antenna action plan
- Colored indicators for AGC signal levels
- SDK for easy user program interface
- Easy and intuitive configurable desktop
- User-defined multiple views
- Advanced antenna log, limited only by disk space

The Gaia100 Advantage

Gaia100 is field proven with large installed base around the world. A mature, low-load design and heritage Field Replaceable Units (FRUs) and software are common to the entire Gaia100 series, ensuring high reliability, spares commonality, ease of maintenance and reduced lifecycle costs of ownership across a site or network.

Applications

Orbit’s globally installed tracking systems operate under extreme environmental conditions to meet the needs of a broad range of challenging applications, including:



Gateways and
TT&C for MEO/LEO
constellations



Weather
forecasting



Disaster
monitoring and
control



Search
and rescue
missions



Surveillance
for military and
homeland security



Oil & gas
exploration



Land
mapping

World-Class Customer Support

Through our International Service Centers, Orbit's trained support engineers are available 24/7 to handle the urgent needs of customers worldwide. A global inventory replenishment system ensures efficient spare parts distribution across regions.

With the capability to remotely access systems for troubleshooting and diagnostics, Orbit's real-time service support increases availability for enhanced customer satisfaction and cost benefits.

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Gaia100 System Specifications

	Gaia 100 2.4 m	Gaia 100 3.7 m	Gaia 100 4.5 m	Gaia 100 5.5 m
Antenna Diameter	2.4 m (7.9 ft)	3.7 m (12.1 ft)	4.5 m (14.7 ft)	5.5 m (16.4 ft)
Frequency Range *Additional frequency ranges per request	S-Band Transmit: 2025–2120 MHz S-Band Receive: 2200–2300 MHz X-Band Receive: 7900–8400 MHz Optional X-Band (7700–8500 MHz) Ka-Band Receive: 25500–27000 MHz		S-Band Transmit: 2025–2120 MHz S-Band Receive: 2200–2300 MHz X-Band Receive: 7900–8400 MHz Optional X-Band (7700–8500 MHz)	
G/T (including radome loss)	S-Band: 9 [dB/°K]; X-Band: 21.5 [dB/°K] Ka-Band: 28.2 [dB/°K]	S-Band: 14.0 [dB/°K]; X-Band: 26.0 [dB/°K] Ka-Band: 32.0 [dB/°K]	S-Band: 14.5 [dB/°K]; X-Band: 27.1 [dB/°K]	S-Band: 16.2 [dB/°K]; X-Band: 29.5 [dB/°K]
Environmental Conditions				
Wind Operational/Survival	185 Km/hour (115 miles/hour). 250 Km/Hour (155 miles/hour) with radome reinforcement			
Temperature Range	Operational: -25°C to +55°C (-13°F to +130°F), (-40°C/-40°F optional) Storage: -40°C to +70°C (-40°F to +158°F)			
Altitude	Operational: 6,300 meter (20,000 ft) Transportation: 12,600 meter (40,000 ft)			
Rain	IP rating X6 (radome enclosed)			
Mechanical Specifications				
3 Axis	Az: Continuous rotation / Elevation: 0–110° / Tilt: ±25°			
Radome Dimensions				
Base Diameter	4.0 m	4.9 m	6.4 m	7.0 m
Height	3.6 m	4.6 m	5.6 m	6.6 m
Power Input	90–130VAC or 200–250VAC 50/60Hz			
Safety	EN 60204-1, ISO 12100-2, EN 614-1, IEC 60945:2002			