

GG24 Sensor

GPS+GLONASS™

All-in-view Positioning
Single Receiver Solution



GPS & GLONASS SEAMLESS INTEGRATION

With the addition of GLONASS to its leading GPS technology, Ashtech® has expanded the availability, integrity and accuracy of global positioning tools. GLONASS, the Russian equivalent of GPS, adds another 24 satellites for precision positioning using the AshtechGG24™ receiver.

The GG24 is the first all-in-view GPS+GLONASS receiver. Its revolutionary design allows smooth integration into a wide range of positioning applications on land, sea or in the air.

Incorporating the GG24 is simple because Ashtech uses advanced methods to blend GPS and GLONASS into a single position solution. The sophisticated combination of the technologies is transparent to the user. The GG24 uses all available satellites from both systems to obtain the best position information.

INCREASED AVAILABILITY

One of the primary advantages of GPS+GLONASS is the increased satellite coverage. With 48 satellites from the combined constellations,

there are twice as many satellites available for position computation. Thus, GPS+GLONASS is extremely beneficial in obstructed operating environments, such as in cities around buildings, mountainous areas, under tree cover, or other areas where much of the sky and many of the satellites can be blocked.

To take advantage of the increased satellite availability, the GG24 has 12 channels for L1 GPS and 12 channels for L1 GLONASS, providing all-in-view tracking for both constellations.

IMPROVED INTEGRITY

By using GPS+GLONASS, users benefit from the integrity of two independently operated satellite positioning systems. With more satellites available, the constellation geometry is significantly improved, providing users with added confidence in the accuracy of the positioning solutions.

GREATER ACCURACY

Autonomous GPS+GLONASS positions are typically within 16 meters of truth, compared to potential errors of up to 100 meters for GPS alone.

DIFFERENTIAL ACCURACY

With DGPS, corrections have to be provided every few seconds from the base station because errors caused by SA are constantly and rapidly changing. With GLONASS there is no SA, so differential corrections are valid much longer and meter-level differential accuracy is possible with corrections more than 1 minute old. This means that DGLONASS corrections can be added to an existing differential data link without a significant impact on the required bandwidth.

IMPROVED VELOCITY ACCURACY WITHOUT DIFFERENTIAL

Velocity accuracy of autonomous GLONASS is significantly better than autonomous GPS. In fact, autonomous GLONASS velocity accuracy is even better than differential GPS. The result is a breakthrough for precision navigation.

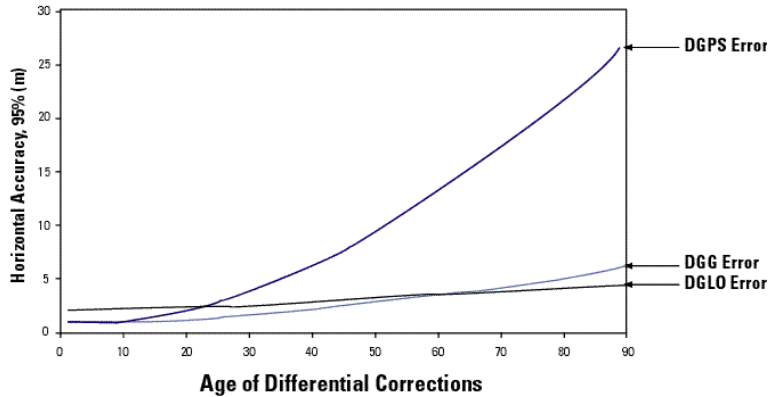
WINDOWS EVALUATION SOFTWARE

Ashtech Evaluate™ PC software provides a visual display of satellite information (SNR, azimuth, elevation, etc.), receiver position and velocity, as well as data logging and analysis. It also provides direct communication with the receiver. It runs under Windows®, Windows 95® and Windows NT®.



GG24™ Specifications

DGPS, DGLO & DGG Accuracy



Real-Time Position Accuracy¹

Mode	CEP (50%)	95%
Autonomous		
GPS+GLONASS™	7m	16m
GPS-only	25m	100m
GLONASS-only	8m	20m
Differential		
GPS+GLONASS	35cm	75cm
GPS-only	40cm	90cm
GLONASS-only	50cm	1m

Velocity Accuracy¹ (knots)

Mode	Mean	95%
Autonomous		
GPS+GLONASS	0.15	0.30
GPS-only	1	4
GLONASS-only	0.03	0.05
Differential		
GPS+GLONASS	0.04	0.10
GPS-only	0.05	0.10
GLONASS-only	0.02	0.05

GG24 Standard Features

- 12 channels L1 GPS code & carrier
- 12 channels L1 GLONASS code & carrier
- Raw data output (code and carrier)
- Strobe Correlator multipath mitigation
- 30-second warm start (typical)
- 40-second cold start (typical)
- 2 second re-acquisition time (dynamic independent)
- Geoid and Magnetic Variation models
- Receiver Autonomous Integrity Monitoring (RAIM)
- Standard NMEA-0183 V2.01 output
- 1PPS timing signal (5V TTL)
 - Accuracy: 45 ns (differential)
 - 70 ns (stand-alone)
- User-selectable standard datums
- User-definable datum

Specifications are subject to change without notice.

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GG24 Remote Features

GG24 Standard Features and:

- Differential Remote RTCM V2.1 Message Types 1,2,3,6,9,16, and 31,32,34,37 (from future V2.2)
- Position and raw data update rates user-selectable up to 5Hz
- 20Gs tracking capability
- Event Marker

GG24 Base Station Features

GG24 Standard Features and:

- Differential GPS Reference Station RTCM V2.1 Message Types 1,2,3,6,9,16, and 31,32,34,37 (from future V2.2)
- Position and raw data update rates user-selectable up to 2Hz

Optional Features

- External reference frequency input
- Software toolkit

Communications

- 3 bi-directional RS232 serial ports, up to 115,000 bps

¹ Position and velocity accuracy are for horizontal errors based on tests except for the 100 meter GPS-only value, which is the 2dRMS accuracy specified by the U.S. Department of Defense. Tests were conducted in California and Moscow with 10° antenna mask angles, medium-high multipath environment. Tests at different locations under different conditions may produce different results.

GG24 Base Station board used to provide differential corrections over a short baseline. Differential data rate 300bps, HDOP<4. Position accuracy specifications are for horizontal position. Vertical error <2 × horizontal error.

Antenna

Each GG24 receiver uses one antenna to receive both GPS and GLONASS signals. The antenna connects through a single antenna port on the GG24 receiver.

Physical & Environmental

Operating Temp	-30° to +55°C
Storage Temp	-40° to +85°C
Power Consumption	3.6W (receiver) 0.3W (typ, antenna)
Input Voltage	6-15VDC
Weight	3.4 lbs
Dimensions	172mm W × 58mm H × 225mm D
Water Resistance	
Wind-driven rain	MILSPEC 810E
Wind-driven dust	MILSPEC 810E
Speed (Max)	1,000 knots*
Altitude (Max)	60,000 ft*
FCC	Class A
CEMark	

*Higher altitude and velocities are available under validated export license.

Ordering Information

GG24 Sensors (Receivers only)	Part Number
Sensor, Remote	990253
Sensor, Base	990252
GG24 Systems*	Part Number
Sensor, Remote	990254
Sensor, Base	990255

*Systems include a GG24 receiver antenna, power supply, cables, manuals and the Ashtech Evaluate software and manual.

