

AQG-A

Absolute Quantum Gravimeter for indoor applications

The AQG is an absolute gravimeter based on quantum technologies and atom-light interactions, offering unparalleled accuracy of 10 nm/s^2 . Using laser-cooled atoms as a free-falling test mass in a vacuum, it enables self-referencing. Since 2015, the AQG has been the first commercially available gravimeter utilizing quantum technology. Built on atom interferometry principles, approved by the International Bureau of Weights and Measures (BIPM), the AQG sets the standard in high-precision traceable gravitational measurements. Its built-in design allows for easy deployment without requiring any knowledge in quantum physics.



FEATURES

- Absolute gravity measurement at a level of nm/s^2 sensitivity and stability
- Continuous data acquisition from a few seconds to several years
- Transportable device, easy and quick to operate
- Full remote control and support/monitoring capability
- Low maintenance (no moving parts, no gasket or belt to replace/no vacuum or mechanical parts to replace)
- Off-power transport and storage possible for several weeks

BENEFITS

- Fibered components, no optical alignment required
- No alignment procedure necessary
- Extremely compact design
- Excellent robustness to ground vibrations
- High reliability (lifetime > 50,000 hours)
- Sensor head can be moved within a 15-meter radius without moving the supply rack
- Enables remote control, monitoring, and support

APPLICATIONS

- Natural resources management
- Geodesy
- Volcanology
- Metrology
- Subsurface imaging



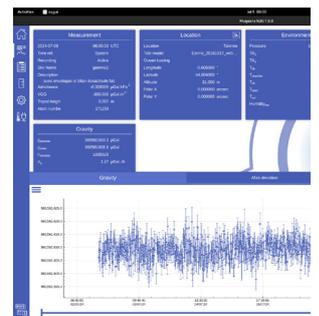
Easy cable management



15 m long cable



Only 4 connectors



User friendly interface

TECHNICAL SPECIFICATIONS

Performance

Typical Precision at a quiet site	500 nm/s ² /sqrt(t) ⁽¹⁾⁽²⁾ 50 nm/s ² in 1,5 min 20 nm/s ² in 10 min 10 nm/s ² in 40 min
Long-term stability	≤ 20 nm/s ²
Trueness	≤ 150 nm/s ² ⁽³⁾
Repeatability	≤ 50 nm/s ²
Cycling frequency	1.85 Hz

Physics package

Number of boxes	3
Maximum mass of each box	45 kg
Total mass	< 100 kg
Dimensions of sensor head	1 module: Diameter 40 cm x Height 100 cm / (tripod incl.)
Dimensions of control unit	1 modules: Height 70 cm x Width 55 cm x Length 70 cm
Warm-up time (typical) Start / stop function	2 hours, enabling rapid setup once warmed-up
Nb of connections	4
Observation time to achieve 10nm/s ² precision	2 hours
Length of cable between sensor head and laser system	15 m

System Interface & Control

Control system	External computer (Linux OS)
User Interface	Dedicated software
Remote Control and Monitoring	With TeamViewer
Data format	.csv (All corrections (tides, ocean loading, atmospheric pressure) are recorded for easy post-processing)

Environmental & Physical Specifications

Operating Temperature / Storage temperature	[18 ; 24] °C / [5 ; 30] °C
Humidity	60%

AC/DC Power requirements

Operating Voltage	110 V/230 V
Operating power consumption	350 W

(1) Guaranteed Precision measured @ Exail premises: 800 nm/s² / Typical Precision measured @ quite site 500 nm/s²

(2) Allan deviation with a white-noise behavior of 500 nm/s²/sqrt(Tau) or below between 50 and 600 s integration time

(3) By measurement / Error budget characterized at Exail premises prior to shipment and corresponding accuracy table delivered with the test report