

Aquarius[®] / Aquarius²



The Reference in Maritime Positioning System



Features

- Fast, real-time centimeter accuracy
- Long range kinematic positioning
- BACKUP feature for ultimate position availability

Long Range Kinematic: Beyond RTK

Aquarius from Magellan is the ultimate answer to the expectations of the rigorous and demanding world of marine surveying. With our dual-frequency LRK[®] kinematic processing technology - today a standard renowned for its outstanding performance - you get fast, real-time centimeter-level positioning combined to a fully operational radio link up to 40 km. With LRK, you will be able to work at greater distances than conventional RTK.

Aquarius² provides in addition a new dimension to marine surveying: precise heading, up to 0.01°, at the same time as LRK kinematic positioning with unrivalled levels of performance.

Flexibility & Ergonomic

To guarantee the highest level of performance and reliability in various operational environment, all possible data link configurations have been thought up. Not only can you take advantage of the high-performance UHF link designed by Magellan (U-Link) but you can also use an HF/MF link (HM-link) providing full compatibility with existing networks. Choose the built-in radio configuration (up to 2 internal radio modules) that best meets your needs or use one or several external source through one of the numerous I/O ports. To even more increase your project flexibility Aquarius is compatible with several data format (RTCM, Magellan, CMR/CMR+).

We have included in Aquarius all the features you need including a floating power input, a sealed ultra-resistant case as well as essential interfacing capabilities. Aquarius can be configured, monitored and controlled locally or remotely through the front panel, remote commands or a dedicated configuration software ConfigPack™.

Ultimate Reliability

Designed for high demanding marine survey applications, Aquarius and Aquarius² now offer a unique full BACKUP™ feature where a second position fix is computed to guarantee an extreme position availability. Aquarius also offers you "Relative OTF" mode which computes the relative position of a second mobile: in real time and with centimeter precision. With Aquarius you have at your disposal the best positioning product family available today to boost your efficiency.

Aquarius / Aquarius² Technical Specifications

Applications

- Hydrographic / Multi-beam Surveying
- Dredging
- Offshore Surveying
- Laying of Cables and Pipelines
- Construction
- Machine Automation

Main Features

- L1/L2 LRK centimeter real-time positioning
- L1 KART centimeter real-time positioning
- Navigation Functions available using TRM100:
 - Profile and homing modes
 - Quality Control menus: GPS, radio, precision, etc.
 - Graphical menus including zoom function
- User Coordinate System:
 - Local datum, projection, geoid mode

Aquarius Configuration and Standard Supply

	Standard Features	Firmware Options	Hardware Options
Aquarius - 01	Receiver with keyboard & screen NAP 001 antenna with standard supply Firmware: DGPS, EDGPS, KART, BACKUP	REFSTATION RELATIVE OTF	Rx 4812 U-Link Reception Module (x1 or x2) Rx 1635 HM-Link Reception Module (x1 or x2) Tx 4800 U-Link Transmission Module
Aquarius - 02	Receiver with keyboard & screen NAP 002 antenna with standard supply Firmware: DGPS, EDGPS, KART, BACKUP	LRK REFSTATION RELATIVE OTF	Rx 4812 U-Link Reception Module (x1 or x2) Rx 1635 HM-Link Reception Module (x1 or x2) Tx 4800 U-Link Transmission Module
Aquarius ²	Receiver with keyboard & screen NAP 002 antenna (x2) with standard supply Firmware: DGPS, EDGPS, KART, HEADING, RELATIVE OTF, BACKUP	LRK REFSTATION	Rx 4812 U-Link Reception Module (x1 or x2) Rx 1635 HM-Link Reception Module (x1 or x2) Tx 4800 U-Link Transmission Module

Standard Supply List

- NAP 001 L1 geodetic antenna; Dia.: 143 mm (5.63"); 0.35 kg (0.77 lb)
- NAP 002 L1/L2 geodetic antenna; Dia.: 143 mm (5.63"); 0.35 kg (0.77 lb)
- Power cable, RS232 serial cables (x 2), RS422/RS232 adaptor
- TRM100 keyboard & screen terminal, its mounting kit and a 1 meter cable
- Mounting bracket and receiver mounting kit
- Rugged transport case

Heading & Relative GPS Specifications¹

Heading

	Precision Range	Baseline Length	Heading Precision (RMS)	Initialization Time (s), Typical
Aquarius ²	0.1 to 0.01°	> 2 m	0.2° / D*	5 s/m

* D= Baseline Length in meters

Relative GPS

- OTF initialization time: 30 seconds, typical
- Same level of precision as in positioning (EDGPS, KART, LRK)

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Magellan follows a policy of continuous product improvement; specifications and descriptions are thus subject to change without notice. Please contact Magellan for the latest product information.
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Positioning Specifications¹

Real-Time Centimeter LRK Mode (L1/L2)

- Operating range up to 40 km (5 SVs or more) with OTF kinematic initialization
- OTF initialization time: 30 seconds, typical
- Precision:
 - In KR Fast Mode (20 Hz max. and 5-ms latency):
 - 10 mm + 0.5 ppm, XY
 - 20 mm + 1.0 ppm, Z
 - Mode synchrone KA (1Hz, latence 1s):
 - 5 mm + 0.5 ppm, XY
 - 10 mm + 1.0 ppm, Z

Real-Time Centimeter KART Mode (RTK L1)

- Operating range up to 12 km (5 SVs or more) with OTF kinematic initialization
- OTF initialization time: 10 minutes, typical
- Precision: same as LRK mode

Real-Time Decimeter EDGPS Mode

- No operational limits of distance; U-LINK radio reception required
- Data convergence time: 2 minutes, typical
- Precision: 20 cm + 2 ppm, XYZ

Real-Time Metric WAAS/EGNOS Mode

- Service area as defined for the system of satellites used. The different systems available are: WAAS in North America, EGNOS in Europe and MSAS in Japan
- Precision: 1 to 2 meters, XY; 3 meters, Z

Technical Specifications

GPS/GNSS

- 16 x L1 channels - 12 x L2 channels (Aquarius-02 & Aquarius²)
- C/A code and L1 phase, P code and L2 phase with multi-path processing
- Differential modes: WAAS/EGNOS, Numeric RTCM Version 2.2, messages 1, 3, 5, 9, 16, 18 & 19

Raw Data:

10 Hz output rate

Computed Data:

20 Hz output rate - Latency < 5 ms (0.005 s)

Interface

- Integrated TRM100 Navigation & Control terminal, 1/4 VGA screen
- GPS and Radio Antenna connectors: 1 female TNC (GPS) and 1 or 2 female TNC (Radio)
- 4 two-way I/O ports (one RS232, three RS422) with baud rates from 1200 to 115200 bauds
- AUX port (1 PPS output, external event input, etc.)
- TRM100 display also available on VGA output
- NMEA 0183 messages: RTCM, Magellan format, CMR/CMR+
- User messages via ConfigPack

Electrical

- Power source: 9 to 36V DC, floating input
- Consumption: 10 to 21 W depending on configuration used

Environmental

- IP 52 compliant, ultra-resistant aluminum case
- Operating temperature range: -20 to +55°C (antennas: -40 to +70°C)
- Storage temperature range: -40 to +70°C
- Vibration: EN 60945 & ETS 300 019 (Shocks)
- EMI: EN60945, Class B FCC Part15

Physical

- H x W x D: 125 x 245 x 305 mm (4.92 x 9.64 x 12")
- Weight: 4.2 kg (9.26 lb)

Radio Module Options

Tx 4800 U-Link UHF Transmission

- Transmission module operating in UHF band
- 410 to 470 MHz
- Data formats: LRK (RTK) and RTCM
- Modulation type: GMSK at 4800 bits/s
- Radiated power: 4W or 0.5W (according to local authorization)
- CXL-70 3 dB antenna
- Norm ETS 300-113 - Certified in Europe, the US and most other countries
- R & TTE 1999/5/CE
- EMI specifications: EN60945

Rx 4812 U-Link UHF Reception (1 or 2 built-in modules)

- Reception module operating in UHF band 410 to 470 MHz
- Reception module designed to be integrated into the receiver
- Modulation type: GMSK 4800 bits/s or DQPSK 1200 bits/s (NDS 100 type)
- CXL-70 3 dB antenna

Rx 1635 HM-Link HF/MF Reception (1 or 2 built-in modules)

- Reception module designed to be integrated into the receiver
- Dual-channel in HF band 1.6 to 3.5 MHz; BCPSK modulation (NDS 200 type)
- Dual-channel in MF band 270 to 330 kHz; MSK modulation
- DHM 5000 dual-band antenna - H x Diameter: 245 x 135 mm (9.64 x 5.31")

¹ All performance figures are 1 RMS values based on test conducted in Nantes, France, in normal conditions of GPS reception, (normal ionospheric activity, 5 satellites used and HDOP < 4) on a clear site.

¹ Tests in different locations under different conditions may produce different results.



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