BANGGA BUATAN INDONESIA

ROBOMARINE
EXPLORE DEEPER !

GEOMAR

Full Autonomous Bathymetry USV

First Indonesian autonomous USV with proven professional application. High performance, customisable payload at affordable price guaranteed with full local support

GEOMON SOFTWARE

AUTONOMOUS WAYPOINT

RC OPERATION

scan me

Web : www.robomarine.com Email: contact@robomarine.com (022) 82005832

USV GEOMAR

GEOMAR

USV Geomar adalah kapal survey yang dapat diprogram untuk bergerak secara autonomous dengan pilihan Teknologi sebagai berikut :
GNSS : Single antenna rover, RTK & PPK,
Multi antenna With heading output, RTK & PPK
Payload : SBES single freq, SBES dual freq, MBES, ADCP.
Light Weight : Standard Fiber Glass hull,Light weight Carbon Fiber hull.
Hull dimension : Standard hull, Long hull.
Battery : Single, Double.

PENJELASAN

GM-02-P02-LB-H02-2

- GM : Geomar
- 02 : Teknologi GNSS : 01: Single antenna rover, RTK & PPK; 02 : Multi antenna With heading output, RTK & PPK
- P02 : PAYLOAD — P01:SBES single freq, P02: SBES dual freq, P03 : MBES, P04 : ADCP
- LB : LIGHT WEIGHT: LA : Standard Fiber Glass hull; LB : Light weight Carbon fiber hull
- H02 : HULL : H01: Standard hull; H02: Long hull
- 2 : Batt : 1: Single; 2: Double

GNSS

01 : Single antenna rover, RTK & PPK
(Swiftnav piksi multi L1/L2)
02 : Multi antenna With heading output, RTK & PPK
(Septentrio AsteRx2eH PRO)

PAYLOAD

P01 : SBES single freq (echologger ecs 400)
P02 : SBES dual freq(Teledyne ODOM ECHOTRAC CV100 [3026-0001-0200])
P03 : MBES (Teledyne Reson SeaBat T20-P Multibeam System)
P04 : ADCP(RiverRay ADCP)

LIGHT WEIGHT

LA : Standard Fiber Glass hull, menggunakan Bahan Fiber Glass agar bobot Ringan dan Efektif
LB : Light weight Carbon Fiber hull. menggunakan bahan Carbon Fiber untuk menambah kekuatan dari body USV

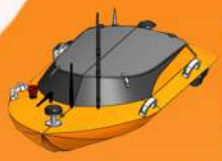
HULL

H01 : Standar hull,Ukuran Lambung kapal yang standar, a = 1200mm, b = 1073mm ,c = 600mm membuat kapal menjadi praktis saat proses survey di area danau
H02 : Long hull. Ukuran Lambung kapal yang lebih besar, a= 2000mm, b = 1308mm, c =1000mm akan cocok untuk prosees survey di area laut

BATTERY

1 : SINGLE, Power Battery yang besar sehingga dapat menyimpan daya sebesar 700WattHour
2 : DOUBLE, Power Battery yang dua kali lipat Lebih besar sehinga dapat menyimpan daya sebesar 1400WattHour

BANGGA BUATAN INDONESIA



GEOMON

GEOMAR MONITOR

ROBOMARINE
EXPLORE DEEPER !

USV

Graphical User Interface

Telah dikembangkan selama 9 Tahun dengan pengalaman aplikasi profesional komersial pada lingkungan kerja yang sebenarnya

FEATURES

User Friendly
Software yang mudah untuk di Operasikan

Depth Trace Monitor
Jejak kedalaman terpantau secara langsung dalam Peta Navigasi

GNSS Status
Status sinyal Phase Fix GNSS selalu termonitor untuk menjamin kualitas hasil survey

Speed Indicator
Dilengkapi dengan indikator khusus untuk memantau kecepatan USV.

Waypoint Generator
Membuat waypoint secara otomatis dalam boundary dengan jarak antar garis rute yang dapat diatur

USV Attitude Indicator
Menampilkan sikap wahana dalam orientasi Roll, Pitch dan Yaw

Real Time Survey Monitor
Membaca semua pergerakan USV dalam Peta yang dapat dikustomisasi

Remaining Battery Prediction
Mampu memberi informasi status battery pada USV yang sedang digunakan

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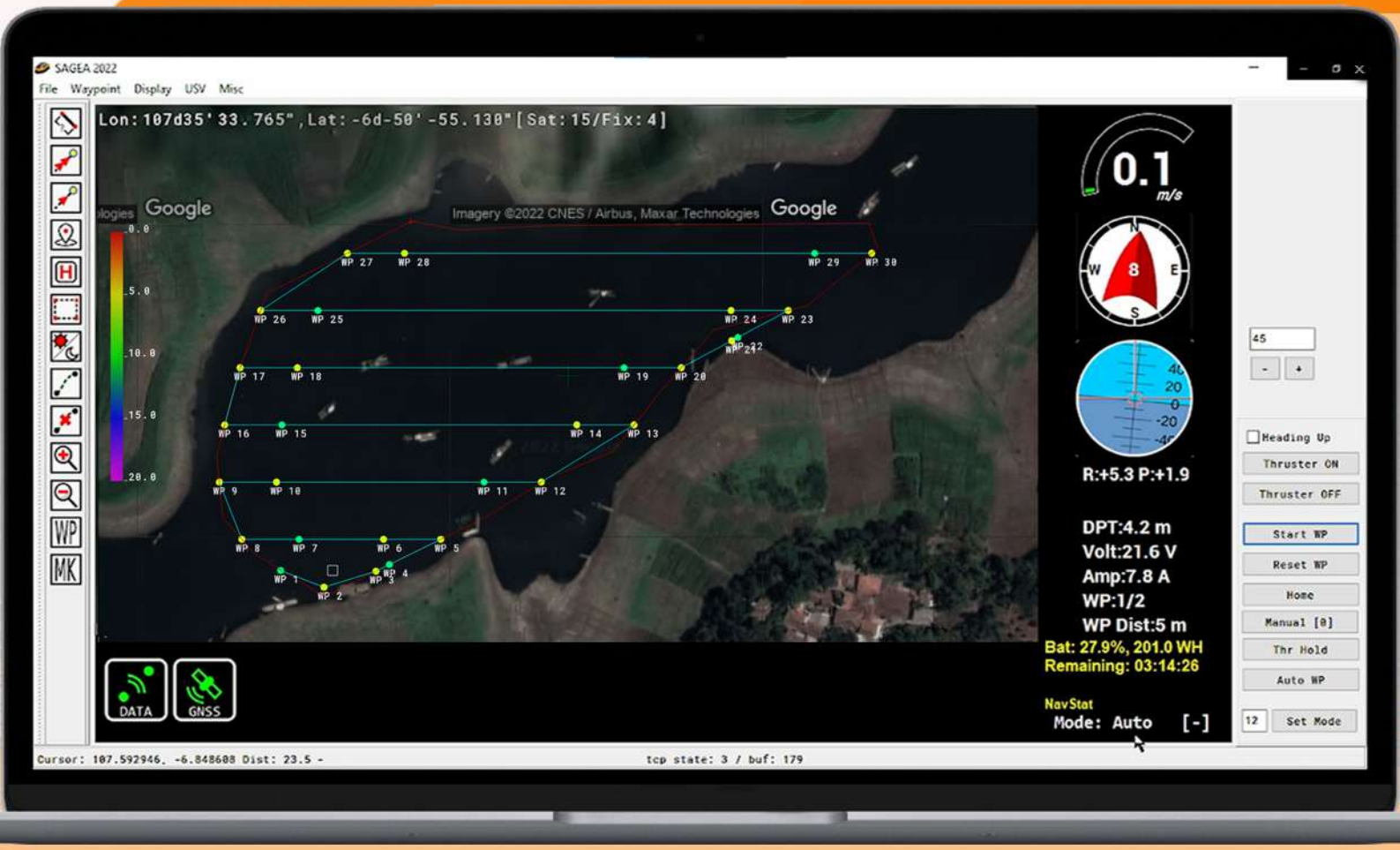
BANGGA BUATAN INDONESIA

GEOMON DISPLAY

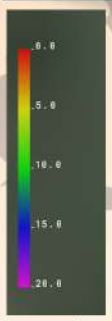
ROBOMARINE
EXPLORE DEEPER !



- Measure Distance
- Create Fast Waypoints
- Create Slow Waypoints
- Create Marker
- Set Home
- Create Boundary
- Use Dark Background
- View Snail Trail
- Erase Snail Trail
- Zoom In
- Zoom Out
- Edit WP
- Edit Marker

Status GNSS

Lon:107d35'33.765",Lat:-6d-50'-55.130"[Sat:15/Fix:4]



Depth Trace Monitor

Speed Indicator

Indicator Connection to USV

Heading Indicator

Indicator GNSS Connection

Roll and Pitch Indicator

DPT:4.2 m
Volt:21.6 V
Amp:7.8 A
WP:1/2
WP Dist:5 m

DPT = output depth
Volt = battery voltage
Amp = battery current
WP = direction to WP- / WP total
WP Dist = distance to WP

Bat: 27.9%, 201.0 WH
Remaining: 03:14:26

Batery prediction

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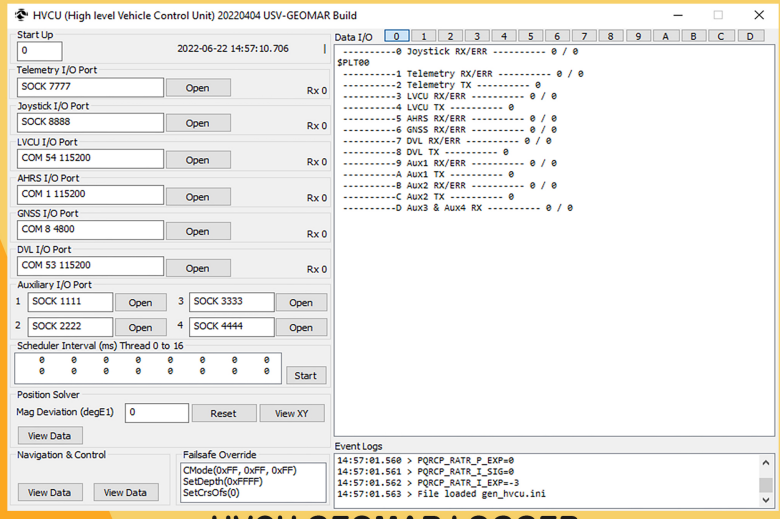
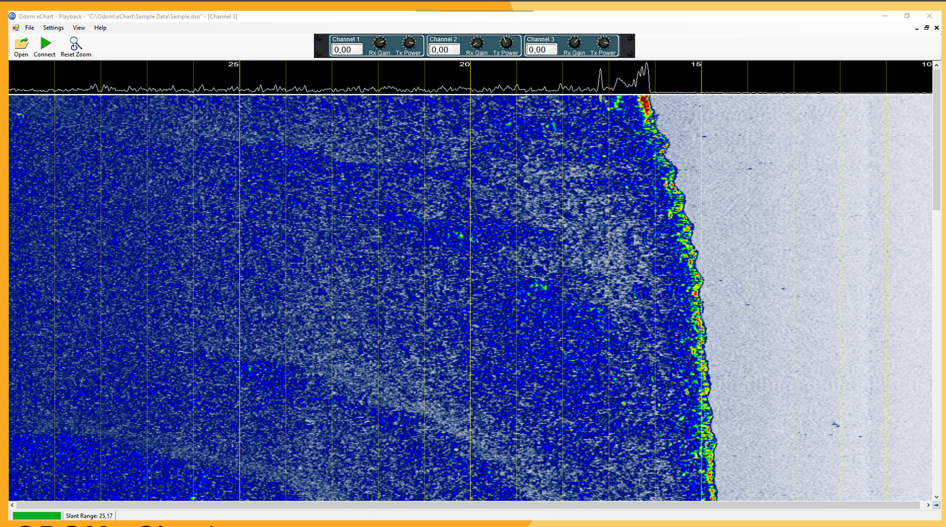
COMPLEMENTARY SOFTWARE

USV GEOMAR



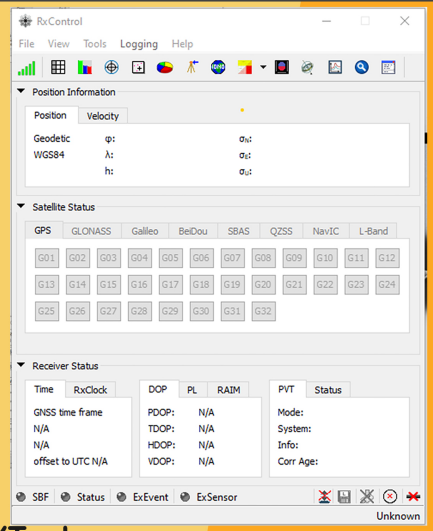
HVCU GEOMAR LOGGER

- Untuk akuisisi output data USV



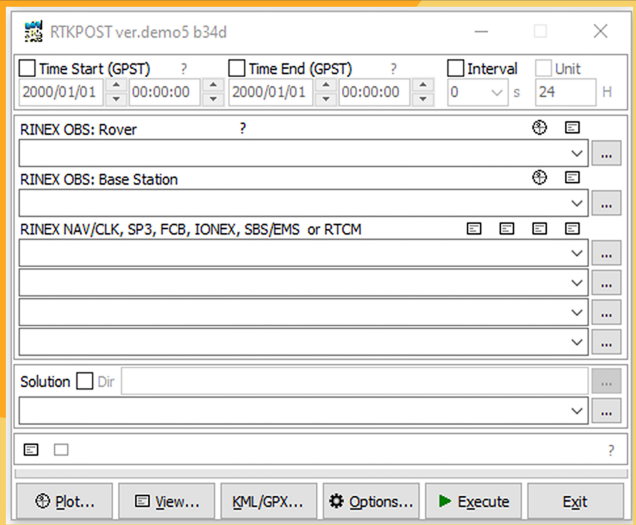
ODOM eChart

- Untuk setting parameter SBES dual freq dan akuisisi data



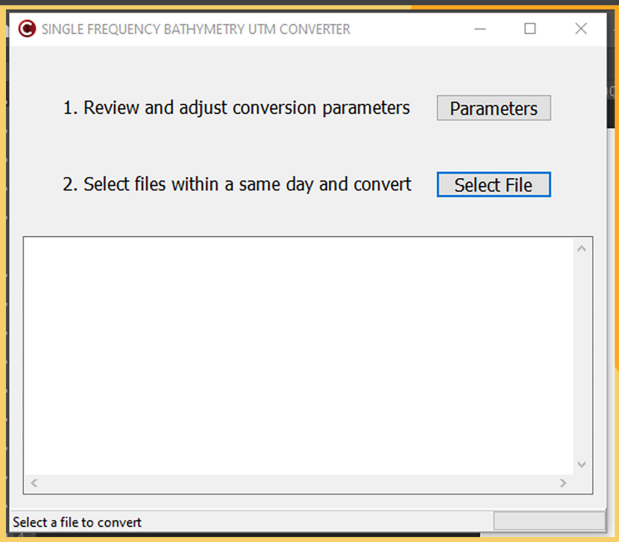
RXTools

- Untuk setting modul GNSS, merubah RAW to RINEX format, dan akuisisi data



RTKPOST

- Untuk melakukan post processing GNSS



Geomar LogProcessor

- Untuk penggabungan X,Y,Z point cloud

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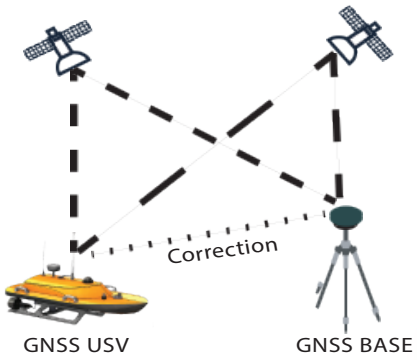
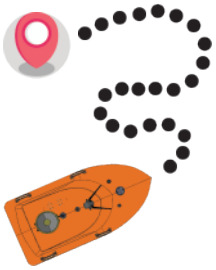
USV GEOMAR

Dengan Mode GNSS RTK



SETTING GNSS

- Setting GNSS Base station
- Pairing GNSS Base station dengan GNSS USV



PENGAMBILAN RAW DATA USV

- USV beroperasi secara autonomous
- Pengambilan data GNSS dan ECHOSOUNDER
- Software : geomar HVCU logger dan GEOMON

PENGGABUNGAN DATA SURVEY

- Penggabungan data GNSS dengan data kedalaman berdasarkan time maker
- Penggabungan dengan data pasang surut
- Menghasilakan output pemetaan batimetri
- Software : LogProcessor GEOMAR

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USV GEOMAR

Dengan Mode GNSS PPK

PENGAMBILAN RAW DATA USV

- USV beroperasi secara autonomus
- Pengambilan data GNSS dan Echosounder
- Software GNSS: RX tools (Septentrio)
- Software Echosounder : eChart

POST PROCESSING DATA GNSS

- Pengunduhan data CORS
- Pengolahan data GNSS USV dengan data CORS
- Software : RTKPost

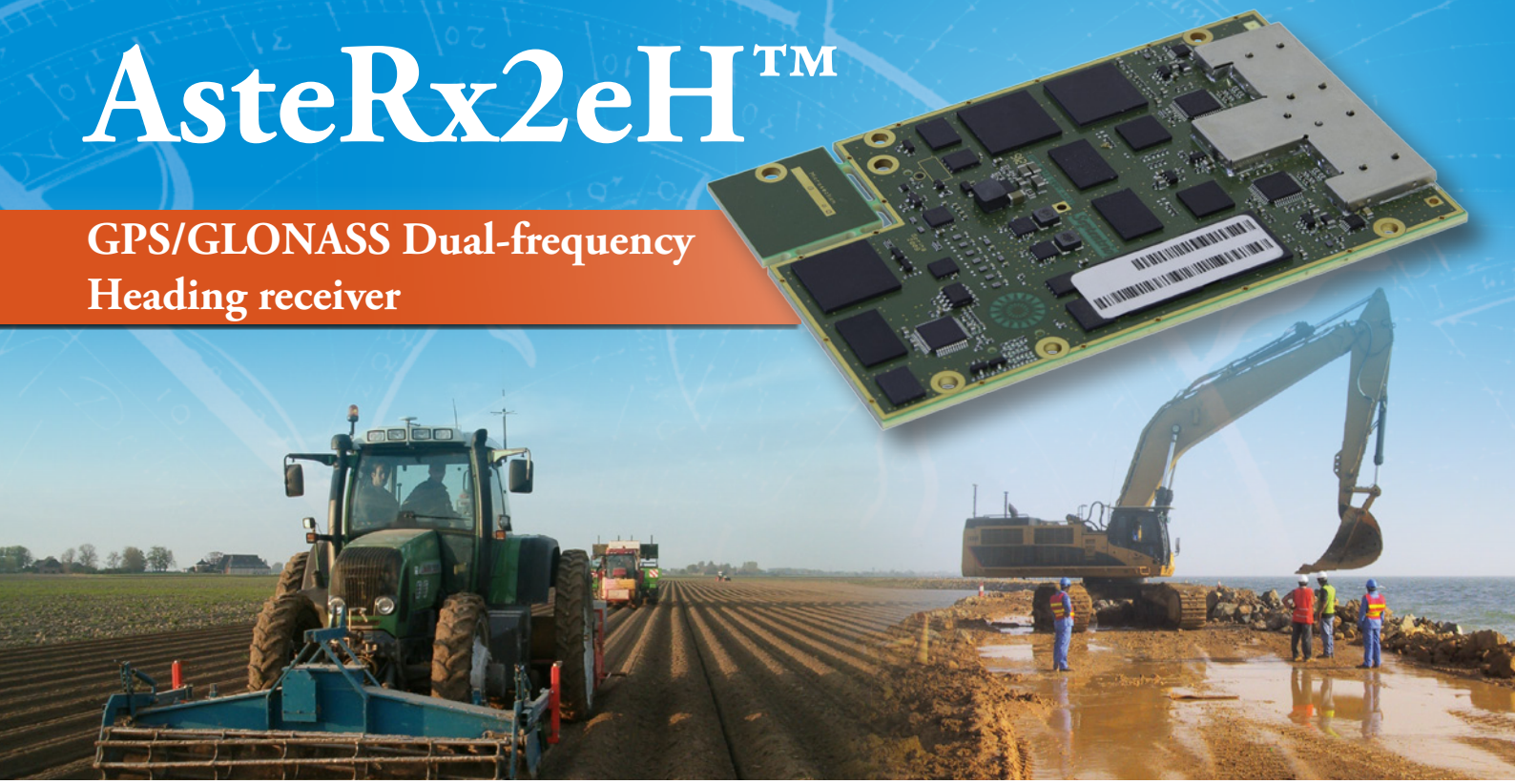
PENGGABUNGAN DATA SURVEY

- Penggabungan data GNSS dengan data kedalaman berdasarkan time maker
- Penggabungan dengan data pasang surut
- Menghasilakan output pemetaan batimetri

Web : www.robomarine .com Email : contact @robomarine.com (022) 82005832

AsteRx2eH™

GPS/GLONASS Dual-frequency Heading receiver



Single-board dual-frequency dual-antenna GPS/GLONASS heading receiver, specially designed for demanding machine control, marine survey and other multi-antenna applications.

Single-board dual-antenna GPS/GLONASS heading receiver

With two antenna inputs feeding 272 multi-frequency tracking channels, AsteRx2eH provides a compact and low power solution for cm-level RTK positioning combined with accurate heading information, at up to 20 Hz. AsteRx2eH tracks both GLONASS and GPS satellites, improving the availability and accuracy in challenging environments where signal blocking by buildings, trees, mountains and other obstructions provide limitations to GPS only systems.

World-class performance with GNSS+

AsteRx2eH offers advanced signal processing for optimal performance under difficult conditions, including:

- Track+: for robust tracking of weak signals
- LOCK+™: provides stable tracking under high vibration and dynamic conditions
- APME+: Advanced code and phase multipath mitigation technology

Easy to integrate

The AsteRx2eH is available as an OEM board for integration, or in a tough compact waterproof aluminium housing (AsteRx2eH PRO) for use in any outdoor environment. The RF section of board is shielded to help avoid EMI issues. The AsteRx2eH interface is fully documented providing the integrator with full flexibility. The interface is compatible with other receivers of the AsteRx2e-family making it easy to build solutions for different accuracy and application requirements with no redesign.

A comprehensive GNSS SW-toolset

The RxTools package includes the intuitive RxControl GUI for receiver configuration and monitoring. Various tools for mission planning, data logging, replay and analysis, reporting, and more, are included.

Key Features

- Single board dual-Antenna GPS/GLONASS receiver
- Precise heading calculation
- cm-level positioning accuracy
- Septentrio GNSS+ algorithms for robust industrial performance
- Easy to integrate, fully documented interface language
- A comprehensive GNSS SW-toolset

Septentrio
satellite navigation

Versatile OEM Receivers for Demanding Applications

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Phone: +1 (888) 655-9998 • Fax: +1 (323) 297 4648

AsteRx2eH™

GPS/GLONASS Dual-frequency Heading receiver

AsteRx2eH PRO

Integrator Kit

AsteRx2eH OEM

FEATURES

- Dual-frequency L1/L2 code/carrier tracking of GPS and GLONASS signals on 2 antennas.
- 272 hardware channels for simultaneous tracking of all visible GPS and GLONASS satellite signals
- Simultaneous RTK and heading calculation
- Up to 20 Hz measurement, position and orientation update rate (user selectable)
- Lock+™ tracking technology
- Automatic or manual antenna calibration
- A Posteriori Multipath Estimator (APME)
- Innovative and flexible power management under user control.
- Includes up to 3 SBAS channels (EGNOS, WAAS, other)
- x PPS output (x = 1, 2, 5, 10)
- 2 Event markers
- RAIM
- Raw data output (code, carrier, navigation data)
- Four hi-speed serial ports
- 1 full speed USB port
- Ethernet
- Highly compact and fully documented Septentrio Binary Format (SBF) output
- NMEA v2.30 output format, (10 Hz max)
- RTCM v2.2, 2.3, 3.0 or 3.1
- CMR2.0 and CMR+
- Compact OEM board and housed solution
- Internal data logging in housed receiver (2GB)
- Includes intuitive GUI (RxControl) and detailed operating and installation manual

PHYSICAL AND ENVIRONMENTAL

OEM	
Size	77 x 120 mm
weight	90 g
Input voltage	+3.0 – 5.5 VDC
PRO	
size	245 x 140 x 37 mm
weight	980 g
Input voltage	9-30 VDC
Antenna LNA Power Output	
Output voltage	+ 5 VDC
Maximum current	200 mA
Power consumption	5 W typical
Operating temperature	-40 to +85 °C
Storage temperature	-40 to +85 °C
Humidity	5 % to 95 % (non condensing)

Connectors	
Antenna	2 x TNC female
10 MHz in	BNC female
PPS out	BNC female
Power	ODU 3 pins female
COM/USB	ODU 7 pins female
IN	ODU 7 pins female
OUT	ODU 5 pins female
Ethernet	ODU 4 pins female

PERFORMANCE

Position accuracy[1,2,3,6]	Horizontal	Vertical
Standalone	1.3 m	1.9 m
SBAS	0.6 m	0.8 m
DGPS	0.5 m	0.9 m
Veripos Ultra/APEX[18]	0.10 m	0.20 m
TERRASTAR D[19]	0.10 m	0.20 m

RTK performance[1,14]	
Horizontal accuracy[3]	0.6 cm + 0.5 ppm
Vertical accuracy[3]	1 cm + 1 ppm
Average time to fix[4]	7 sec

Velocity Accuracy[1,2,3]	Horizontal[3]	Vertical[3]
	0.8 cm/sec	1.3 cm/sec

Heading Accuracy	
1m antenna separation	
Heading	0.3°
Pitch/Roll	0.6°
10m antenna separation	
Heading	0.03°
Pitch/Roll	0.06°

Maximum Update rate	20 Hz
Latency	< 20 msec

Time accuracy[3]	
1PPS	10 nsec
Event accuracy	< 10 nsec
Time to first fix	
Cold start[10]	< 45 sec
Warm start[11]	< 20 sec
Re-acquisition	avg 1.2 sec
Tracking performance (C/N0 threshold)[12,13,15]	
Tracking	26 dB-Hz
Acquisition	33 dB-Hz
Acceleration[16]	10 g
Jerk[17]	4 g/sec

[1] 1-20 Hz measurement rate
[2] Performance depends on environmental conditions
[3] 1σ level
[4] Baseline < 20 km
[5] C/N0 = 45 dB-Hz
[6] Smoothed
[7] Non-smoothed
[8] Multipath mitigation disabled
[9] Multipath mitigation enabled
[10] No information available (no almanacs, no approximate position)
[11] Ephemeris and approximate position known
[12] 95%
[13] Max speed 600 m/sec
[14] Fixed ambiguities
[15] Depends on user settings of tracking loop parameters
[16] During acquisition
[17] During tracking
[18] Requires service activation from Veripos Ltd.
[19] Requires service activation from TERRASTAR.

OTHER SEPTENTRIO PRODUCTS

AsteRx-m – Ultra low power, smaller than credit card GPS/GLONASS dual-frequency RTK receiver, for integration in hand-held devices, mobile computing platforms and other space-constrained applications requiring high accuracy and low-power consumption.

AsteRx2e/2eL – Compact dual-frequency GPS/GLONASS receiver platform, offering top-quality GPS code and carrier phase data and dual-frequency positioning (including DGPS, RTK and PPP (AsteRx2eL)) at up to 25 Hz.

AsteRx3 – A Multi-frequency GPS/GLONASS/GALILEO receiver for demanding industrial applications, featuring precise RTK with extended baselines, advanced multipath and interference mitigation and exceptional tracking stability under high vibration conditions.

AsteRxi – IMU assisted Compact Dual-frequency GNSS receiver platform, offering a 50Hz RTK position based on integrated IMU and GNSS measurements. In addition attitude information such as heading, pitch and roll are provided even in shadowed environments where conventional GNSS receivers fail.

PolaRx4 – fully featured high performance GNSS receiver providing network operators and scientific users with high-quality tracking and measurement of all available and upcoming GNSS signals (GPS/GALILEO/GLONASS/COMPASS/SBAS)

PolaRxS – a multi-frequency multi-constellation receiver dedicated to ionospheric monitoring and space weather applications

PolaNt-x – A set of lightweight sturdy high precision antennas for geodetic, survey and machine control applications. Available in single-frequency GPS/GLONASS or multi-frequency GPS/GLONASS/GALILEO/COMPASS/L-Band variant, for use with the PolaRx and AsteRx receiver families.

Chokering MC – A multi-frequency GPS/GLONASS/Galileo L1/L2/E5abAltBOC chokering antenna for use with the PolaRx receiver family

RxTools – A suite of software applications for easy control of PolaRx and AsteRx receivers, and for easy manipulation, analysis and reporting of the data generated with these receivers

RxMobile – A unique intuitive, portable GUI field controller for the Septentrio receivers. RxMobile allows controlling the receiver, monitoring the navigation solution and accessing its functions in the field in the same intuitive way as with RxControl.

Septentrio satellite navigation

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Teledyne Odom Hydrographic

Echotrac CV100

Single or Dual Channel Echo Sounder

Compact Survey Solution

Move into the digital age with echo sounders from Teledyne Odom Hydrographic. If your survey does not require traditional paper records, then forget about piles of hard copy – the CV-100 has eliminated all that in favor of digital imaging on a PC-based data acquisition system.

With the same technology as the popular Echotrac CV and Echotrac MKIII, including Ethernet communications, Teledyne Odom's CV100 single or dual channel sounder is ready to simplify your transition to the convenience of an all-digital system.

Photo courtesy of Teledyne Oceanscience.

PRODUCT FEATURES

- Multiple time varied gain (TVG) curves (10, 20, 30, and 40 log)
- DSP digitizer with manual filter control
- Manual or auto scale changes (phasing)
- Calibration menu with controls for transducer draft and index plus sound velocity and bar depth controls
- Rugged and waterproof (IP65)
- Help menus
- Flash memory upgradeable
- Auto Gain and Auto Power Modes for minimal operator input
- Suitable for autonomous vessels

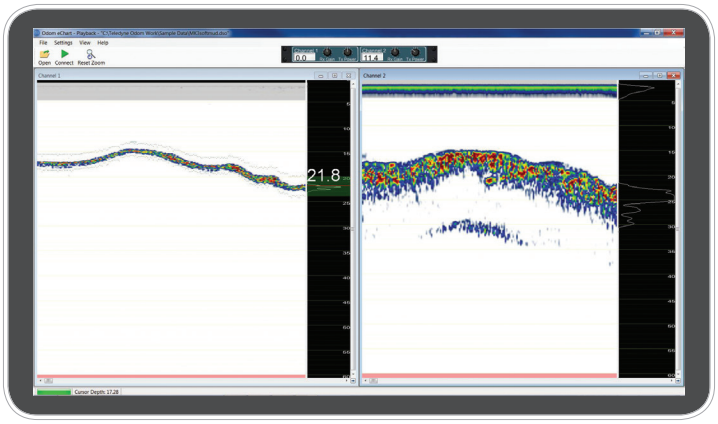
Echotrac CV100

Digital Hydrographic Echo Sounder

TECHNICAL SPECIFICATIONS

Single Channel Configuration[1]	High: 100kHz-750kHz (manual tuning in 1-kHz steps) Low: 3.5kHz-50kHz (manual tuning in 1-kHz steps) variable receiver bandwidth
Dual Channel Configuration	High: 100 kHz-340kHz Low: 24 kHz-50kHz
Resolution	0.01m, 0.1 ft.
Accuracy *(corrected for sound velocity)*	200kHz-0.01 m +/- 0.1% depth 33kHz-0.10 m +/- 0.1% depth
Output Power	Up to 300 watts RMS < 1 watt minimum
Ping Rate	Up to 20Hz in shallow water (10m) range
Depth Range	From <30cm to 600m (depending on frequency and transducer selected)
Input Power Requirement	9-32VDC < 15 watts
Weight	5kg (11lbs)
Dimensions	28cm W (11 in) x 23cm H (9 in) x 11.5cm (4.5 in) D
Mounting	Desktop or bulkhead mount (fixing hardware included)
Ports/Interface	Ethernet (LAN) plus 4 x RS232 or 3 x 232 and 1 x RS422 Inputs from external computer, motion sensor, sound velocity Outputs to external computer or remote display Output string: Odom Echotrac SBT, NMEA DBS, NMEA DBT, DESO 25 Heave Input-TSS1 or "Sounder Sentence" Echotrac Control SW - Simple Windows compatible graphical user interface Storage of full ping to seabed data in DSO format with e-Chart (easily compressed or converted to .XTF for additional processing)
Environmental	Operating 0-50°C Storage -20°-70°C
Options	Heave Sensor
Software Control & Logging Software	Windows based software included: eChart Display

1 Frequency agile in 2 bands (specify band at time of order).



eChart Software.

PLD19107-1

TELEDYNE
ODOM HYDROGRAPHIC
Everywhereyoulook™

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