Bathyswath-3 ALPHA

The innovative Bathyswath-3 technology embedded in ALPHA subsea unit

Performance & Quality

Bathyswath-3 ALPHA gives significant performance & good data quality in a fully integrated system.
- Wideband (chirp) sonar technology.
- 3 sonar frequencies simultaneously, in bathymetry and sidescan.
- Integrated system for a simplified set-up: sonar electronics, motion sensor (INS), GNSS receiver, Sound Velocity Sensor and embedded computers inside the same ALPHA housing.

- Bathyswath-3 provides more data under the boat and better data quality at the swath edge than previous Bathyswath-2 version.
- Low-power consumption.
- With its 3 frequencies Chirp Technology in a complete integrated system, Bathyswath-3 gives you great signal processing, more flexibility, easy use and much less possibilities of errors (i.e. fixed settings and lever arms, fully compatible ancillary devices, etc.).
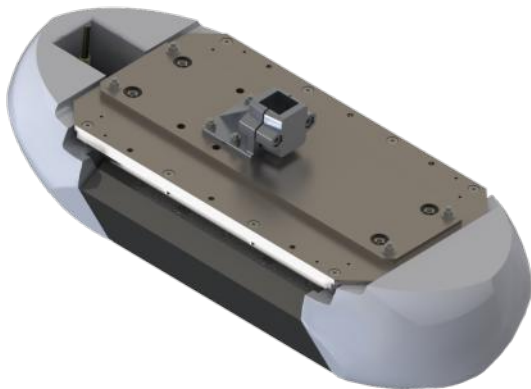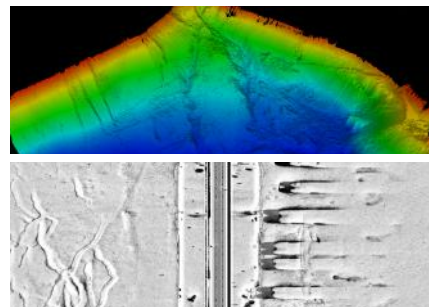
Integrated ALPHA subsea unit

- One optional motion sensor (4 possibilities),
- One optional dual-antenna GNSS receiver for heading and positioning (3 possibilities),
- Sound Velocity Sensor,
- Two embedded computers (one for sonar data acquisition and one for 4G communications & end-user needs).
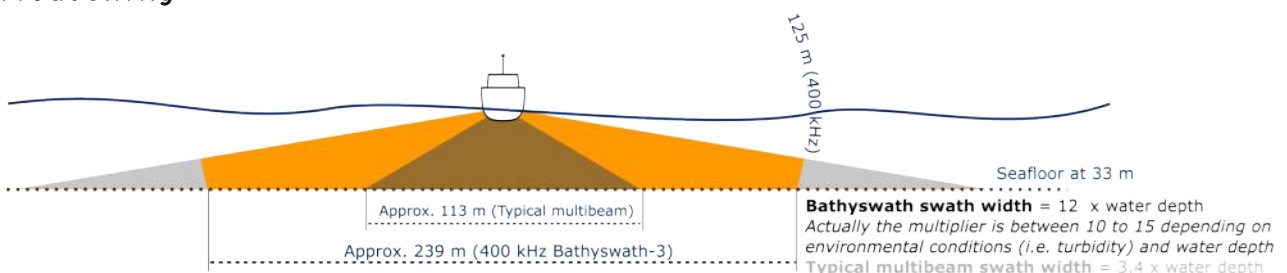
Integrated transducers
- 250, 500 and 1000 kHz acoustic staves in each transducer.
- 1000 kHz dedicated to high resolution sidescan data.

Software, 3D bathymetry & sidescan data
- Included in package price.
- Fully-functional survey software (for sonar, position, sound velocity and motion data acquisition) and post-processing software (for 3D rendering and digital terrain models).
- Bathyswath sonar is also compatible with most usual commercial software packages.

Productivity

Approx. 113 m (Typical multibeam)
Approx. 239 m (400 kHz Bathyswath-3)

125 m (400 kHz)

Seafloor at 33 m

Bathyswath swath width = 12 x water depth
Actually the multiplier is between 10 to 15 depending on environmental conditions (i.e. turbidity) and water depth
Typical multibeam swath width = 3.4 x water depth

SUBSEA UNIT CONFIGURATION

Navigation Communication & Power Board (NCPB)

- Optional Embedded GNNS compass board (Vega™ 40 or Trimble BD992 w/ or w/o INS) and Navsight processing unit (for Ekinox or Apogee IMUs).
- Embedded Raspberry Pi CM3+ single board computer for sonar data acquisition.

Optional Raspberry Pi 4

- For any specific end-user need.
- Embedded 4G/LTE module with integrated antenna (4.0dBi-4.6dBi) for ext. communications.
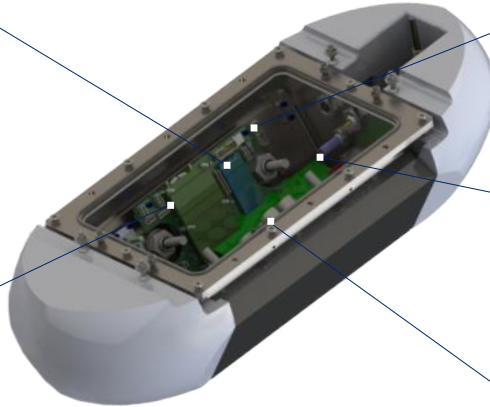
Sound Velocity Sensor

Optional Motion sensor

Ellipse 2, Ekinox 2 or Apogee.

Bathyswath-3 electronics

TECHNICAL SPECIFICATIONS

Sonar specifications

Simultaneous frequencies (kHz)	250	500	1000
Operational slant range (m)	200	100	50
Maximum slant range (m)*	300	150	75
Horizontal beam width, two-way*	0.5°	0.25°	0.25°
Spatial resolution limit (mm)	3	1.8	0.9
Subsea unit dimensions (mm)	642 x 220 x 477		
Subsea unit weight (kg)	18.3		
Pressure depth rating (m)	100		

* Refer to our Bathyswath technical information document (pdf) available on www.iter-systems.com

Optional integrated ancillary devices

GNSS:	▪ Hemisphere H328 or Vega™ 40 GNSS Compass board.	GPS, GLN, GAL, QZSS, BDS, L-Band (Atlas), IRNSS (Vega™ 40 only) heading (0.04°@ 2m baseline), L1/L2, RTK 1cm, rover, 20 Hz (option), 0.5° pitch & roll (Vega™ 40) / 1° pitch & roll (H328).
	▪ Trimble BD992 Dual Antenna, positioning & heading with RTK omniSTAR support.	GPS, GLN, GAL, BDS, L-Band (Omnistar), heading (0.09° @ 2m baseline), L1/L2/L5/E6, RTK 1cm, rover, 50 Hz.
	▪ Trimble BD992-INS.	GPS, GLN, GAL, BDS, L-Band (Omnistar), heading (0.09° @ 2m baseline), L1/L2/L5/E6, RTK 1cm, rover, 100 Hz, 0.1° pitch & roll.
INS/IMU:	▪ Ellipse Series	0.1° pitch & roll, 1° heading (magnetometer), 5 cm real-time heave.
	▪ Navsight Ekinox Series	0.02° pitch & roll, 0.05° heading (w/ GNSS), 5 cm real-time heave.
	▪ Navsight Apogee Series	0.008° pitch & roll, 0.025° heading (w/ GNSS), 5 cm real-time heave.
Computer:	▪ Raspberry Pi 4	4G/LTE communication module / 4Gb RAM, 32Gb micro SD, quad-core Cortex-A72 (ARM v8) 64-bits 1.5GHz, Videocore VI, bluetooth, WIFI.
	▪ Raspberry Pi CM3+	32 Gb eMMC, 1Gb SDRAM (+32Gb SD card), Cortex A53 (ARM) 64-bits.
Power supplies:	▪ Input power range: +12 to 36 VDC	
	▪ Power requirement:	Operating temperature 0° to 70°C, 20 W INS + GNSS solutions.

Other package options

Bathyswath-3 is available in two other package options:

▪ Bathyswath-3 SIGMA: the sonar electronics is integrated with a single compact 2-in-1 pod, for use on very small vehicles and vessels, including man-portable Unmanned Surface Vehicles (USVs),

▪ Bathyswath-3 OEM: sonar electronics and transducers as parts for integration inside clients' systems or vehicles (i.e. AUVs, USVs, etc.).

"The quality of the data collected during the trial was high both in terms of coverage and resolution."
- Neil Crossouard - HR Wallingford survey specialist

FROM A TO Z

Sonar systems engineering.

Training on client's site or on lake in front of our premises.

Software development for our own products or for new interfaces with customers systems.

Remote technical support.

A WIDE RANGE OF APPLICATIONS

| Marine services | Research | Environment | Natural resources | Archeology | Military REA |

Bathyswath a brand of the company ITER Systems

ITER Systems is one of the world's most experienced team of developers of interferometric sonars. Its products are direct descendants of the world's first commercially available interferometric swath sonar system, developed into SWATHplus, which renamed Bathyswath in 2013. Bathyswath-2 was released in 2015, and Bathyswath-3 in 2019 gives yet another significant advance in performance and usability.

ITER Systems provides innovation, quality product at an affordable price, for the international market with high quality technical support. A team of specialized engineers are located in France and in England to answer all your needs.

ITER SYSTEMS

BATHYSWATH