

Gaps Series

Pre-calibrated USBL positioning and communication systems

Gaps Series are Ultra Short Baseline (USBL) positioning and communication systems which combine a USBL antenna and a fiber-optic gyroscope (FOG) in the same housing. Their unique 3D acoustic array enables tracking and communication from the deep sea to extremely shallow water, even at angles above horizontal.



FEATURES

- Compact, all-in-one AHRS/INS and USBL solution
- Absolute georeferenced position for up to 40 beacons
- Acoustic communication (telemetry)
- Compatible with dynamic positioning systems
- Over 500 available preconfigurable targets
- Simultaneous beacons tracking
- 3D acoustic array geometry
- 3rd party transponder compatibility

BENEFITS

- Calibration-free
- Horizontal-tracking
- Highly accurate positioning
- Robust and stable positioning
- Multiple tracking capabilities
- Plug & play deployment & operation

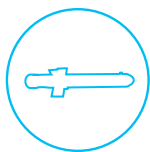
TRACK RECORD

- Integration with all major DP (1, 2, 3 systems) on the market (PRS/MRU&Gyro in one equipment)
- Interfaced available with all major navigation suites
- Major Windfarm, O&G, Cable Laying, Scientific and Defense operations all around the world

APPLICATIONS



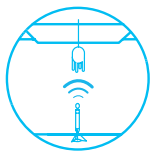
ROV tracking



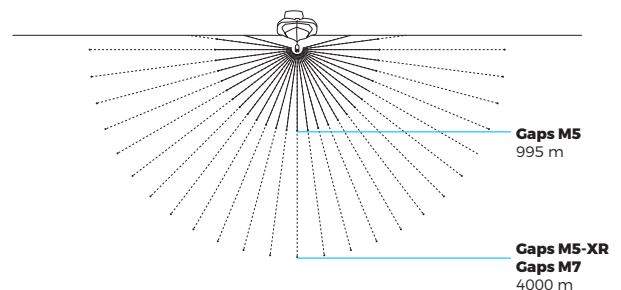
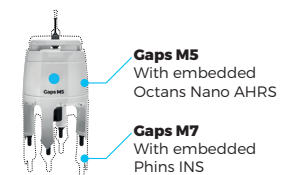
AUV tracking



Marine work



DP



GAPS SERIES SPECIFICATIONS

| Positioning⁽¹⁾ | Gaps M5 | Gaps M7 |
|---|----------------|----------------|
| Operating range | 995m / 4000m* | 4000m |
| Acoustic Precision* (% of slant range CEP50) | 0.10% | 0.06% |
| Absolute accuracy** (% of slant range CEP50) | 0.2% | 0.06% |
| Range / Bearing precision | 0.02m / 0.10° | 0.02m / 0.03° |

*Range restricted to 995m with Gaps M5 and 4000m with Gaps M5-XR (Extended Range version)

| Performance | Gaps M5 | Gaps M7 |
|---------------------|------------------------------|------------------------------|
| Coverage | 200 deg below acoustic array | 200 deg below acoustic array |
| Operating frequency | 21.5 to 30.5 kHz | 21.5 to 30.5 kHz |
| Positioning rate | 0.8 seconds | 0.8 seconds |
| Number of target | 40 | 40 |

| Mechanical | Gaps M5 | Gaps M7 |
|---------------------|----------------------|----------------------|
| Housing | Carbon fiber painted | Carbon fiber painted |
| Weight in air/water | 14 kg / NC | 16 kg / -7 kg |
| Dimensions (HxØ) | 520x296 mm | 638x296 mm |

| INS/AHRS specifications | Gaps M5 | Gaps M7 |
|--------------------------------|-----------------------|-----------------------|
| Type | AHRS | INS |
| Heading accuracy | 0.15 deg seclat (RMS) | 0.01 deg seclat (RMS) |
| Roll/Pitch accuracy | 0.1° RMS | 0.01° RMS |

*: in vertical condition, acoustic and INS/AHRS precision. SNRin > 20 dB

**: In vertical conditions. Including GNSS error of 0.1m. Sound velocity profile compensated. Transponder transmit level = 191 ref µPa@1m. Slant range of 900m. SNR>20dB

GAPS SERIES SPECIFICATIONS

Environments

| | |
|-------------------------------------|--------------------------------------|
| Temperature (Operating and storage) | -5 °C to +35 °C and -40 °C to +70 °C |
| Shock vibration | XPX 10-812 class B |
| EMC | 89 / 336 / EEC – EN 60945 |

Interfaces





| | Gaps M5 | Gaps M7 |
|-------------------|--|--|
| Power supply | 100 to 240 VAC / 50~60Hz or 24/36 VDC - 22 W | 100 to 240 VAC / 50~60Hz or 24/36 VDC - 30 W |
| Control / command | Ethernet with web-based MMI | Ethernet with web-based MMI |
| Input / output | 1x Ethernet (RJ45) and 4 x Serial (RS232/422/485) | 1x Ethernet (RJ45) and 4 x Serial (RS232/422/485) |
| Synchronisation | TTL (BNC) 2 outputs and 2 inputs (1pps) | TTL (BNC) 2 outputs and 2 inputs (1pps) |

GAPS BOX SPECIFICATIONS

| | |
|-------------------------------------|------------------------------|
| Dimension | 233 mm x 330 mm x 94 mm |
| Weight | 4.6 kg |
| Temperature (Operating and storage) | -5°C to +50°C -40°C to +80°C |

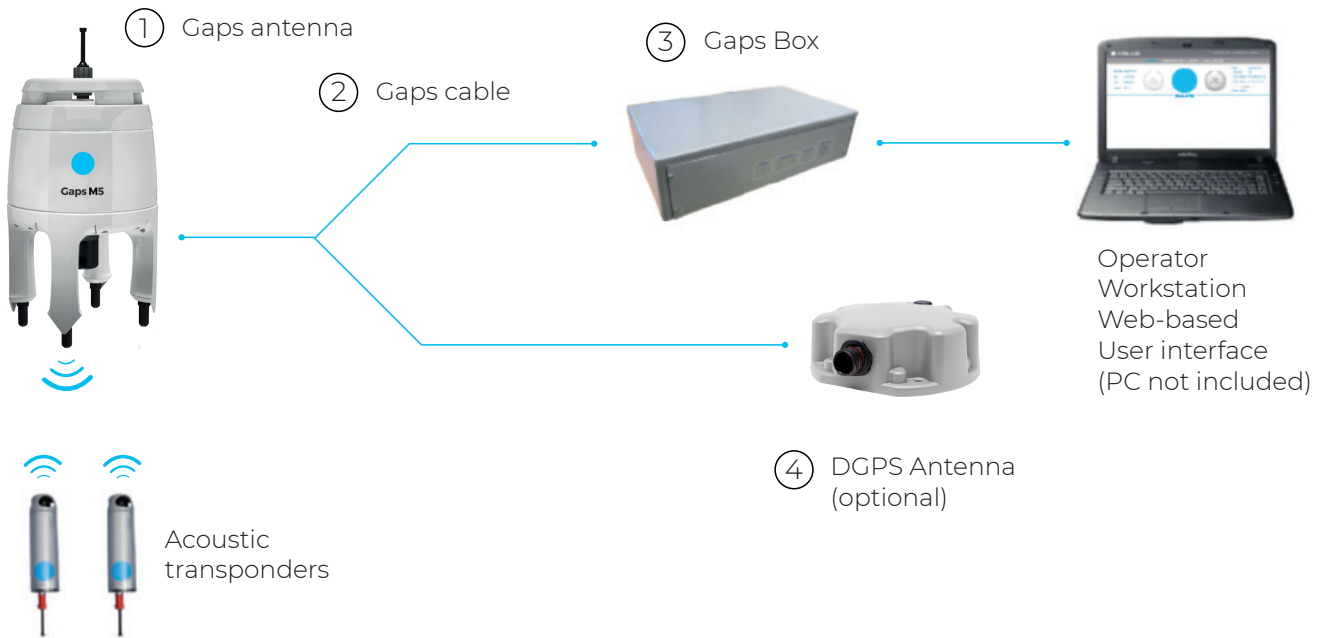
GAPS SERIES TRANSPONDERS

Gaps is compatible with all iXblue MF beacons including:

| Name | Description | Acoustic communication | Applications |
|---|---|------------------------|--|
|  MT9x2 series | Internal rechargeable battery, OEM, 1000, 3000m depth rated | | ROV, Tow fish and diver positioning |
|  MT8x2 series | Internal Lithium battery 3000m and 6000m depth rated | | ROV, Tow fish and diver positioning |
|  MTBx2 series | Mini transponder for AUV OEM and 300m depth rated | ● | AUV positioning |
|  Canopus | LBL and Sparse LBL Intelligent transponder 4000 and 6000m depth rated | ● | AUV positioning, LBL calibration, Dynamic Positioning (DP) |

Third-party transponders compatibility: contact iXblue

COMPONENTS



① **Gaps antenna**
This is the main part of the Gaps system. It combines a USBL acoustic array and INS/AHRS in the same mechanical structure.

② **Gaps cable**
20/50/95m long cable used to communicate with Gaps head. Extendable up to 190m with a Repeater Box.

③ **Gaps Box**
Gaps Box designed to interface between the Gaps head and external peripherals.

④ **DGPS Antenna**
A complete turnkey solution is available on option, including a GPS receiver.

