EvoLogics GmbH develops underwater information and communication systems based on bionic concepts, combining cutting edge engineering with the best ideas found in nature. The advanced product features have become enabling technologies for deep water exploration and production. EvoLogics range of products offers highly reliable, flexible and cost-effective solutions for multiple underwater communication, positioning, navigation and monitoring applications. We strive for innovation and invest our vast experience into developing, manufacturing and supporting products that deliver an excellent performance and solve the most challenging tasks.

The company was founded in 2000 in Berlin, Germany, by a group of leading international scientists and maritime engineering experts. The company since focuses on developing innovative solutions for maritime and offshore industries, as well as smart robotic systems design and bionic research.

EvoLogics GmbH
Ackerstrasse 76
13355 Berlin, Germany
tel.: +49 30 4679 862 - 0
fax: +49 30 4679 862 - 01
sales@evologics.de
evologics.de

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USBL POSITIONING AND COMMUNICATION SYSTEMS

APPLICATIONS

- Positioning of offshore equipment
  - Track the positions of offshore equipment during installation to ensure accurate placement at predetermined coordinates

- Navigation of ROVs and AUVs
  - Simultaneously track positions of multiple ROVs or AUVs and control their missions with instant commands

- Cartography
  - Locate underwater features with geo-referenced coordinates when used together with GPS or differential GPS
  - Increase measurement accuracy

- Diver Tracking
  - Monitor positions of several divers and exchange information with them during the mission

SENSOR INTEGRATION

- ADCP: Acoustic Doppler Current Profiler
- SVP: Sound Velocity Profiler
- CTD: Conductivity, Temperature, Depth, Pressure sensors
- INS: Inertial Navigation System
- More options upon request

S2C R USBL UNDERWATER POSITIONING AND COMMUNICATION SYSTEMS

EvoLogics S2CR USBL is a series of combined positioning and communication devices. Offering powerful USBL transceiver functionality with full benefits of an S2C technology communication link, S2CR USBL devices provide accurate USBL tracking and full-duplex digital communication, delivering an excellent all-round performance, ideal for application scenarios that demand space-, energy- and cost-saving solutions.

Switching between positioning and communication modes is not necessary: positioning data is calculated simultaneously with acoustic transmissions. Both features complement each other in a fully integrated positioning and communication system that opens new possibilities for a wide range of subsea applications.

- Full compatibility - use S2C R- and M-series modems as pingers or transponders
- Patented S2C (Sweep Spread Carrier) Technology - spread spectrum technology based on extensive bionic studies
- Simultaneous USBL positioning and data transmissions, track multiple targets simultaneously
- Can be used as Inverted USBL
- Self-adaptive algorithms for reliable performance in adverse underwater conditions, built-in forward error correction and data compression
- Advanced communication protocol with several data delivery algorithms: send and receive large volumes of data with the highest bitrate possible in current conditions; send and receive short instant messages without interrupting the main data flow between devices
- Addressing and networking: build relay chains and underwater networks with broadcasting capabilities
- Low power consumption and additional power-saving options

MODULES AND OPTIONS

- AHRS (Attitude and Heading Reference System)
- GPS integration
- Integrated rechargeable battery
- Acoustic Wake-Up module
- Integrated data-logger
- Acoustic releaser
- Short- mid- and long-range devices for shallow or deep water applications
- OEM versions available
- Compatible with S2C R modem and LBL solutions
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APPLICACTIONS

Positioning of offshore equipment
Track the positions of offshore equipment during installation to ensure accurate placement at predetermined coordinates

Navigation of ROVs and AUVs
Simultaneously track positions of multiple ROVs or AUVs and control their missions with instant commands

Cartography
Locate underwater features with geo-referenced coordinates when used together with GPS or differential GPS

Increase measurement accuracy
Track the position of sensors and detectors to increase the accuracy of measurements

Diver Tracking
Monitor positions of several divers and exchange information with them during the mission

MODULES AND OPTIONS

- A+RS (Attitude and Heading Reference System)
- GPS integration
- Integrated rechargeable battery
- Acoustic Wake-Up module
- Integrated data-logger
- Acoustic releaser
- Short- mid- and long-range devices for shallow or deep water applications
- OEM versions available
- Compatible with S2C R modem and LBL solutions

SENSOR INTEGRATION

- ADCP: Acoustic Doppler Current Profiler
- SVP: Sound Velocity Profiler
- CTD: Conductivity, Temperature, Depth, Pressure sensors
- INS: Inertial Navigation System
- More options upon request
A USBL transceiver is mounted on a Vessel and uses acoustic signals to determine the distances and bearings to the tracking targets. The USBL transceiver measures the time from transmission of its acoustic interrogation signal until an acoustic reply from the Transponder is detected and converts it to distance to the Transponder. Containing several transducers separated by a short distance (the ultra-short baseline antenna), the transceiver calculates the angle to the Transponder using the phase-differencing method.

Transponders are attached to several tracking targets, for example, to autonomous underwater vehicles (AUVs), remotely operated vehicles (ROVs), towfish etc. The Transponders reply to acoustic signals from the USBL transceiver with their own acoustic pulses, allowing it to calculate their positions. Optional third-party external instruments (an AHRS sensor and/or a GPS receiver) provide information about the vessel’s orientation and real-world coordinates. The customer’s Navigation computer is interfaced with the USBL transceiver and the external instruments and is connected to the local computer network.

EvoLogics positioning software, the SiNAPS, is installed on the Navigation computer. EvoLogics SiNAPS positioning software controls the positioning system and provides display features to monitor the mission in real-time.
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Transponders are attached to several tracking targets, for example, to autonomous underwater vehicles (AUVs), remotely operated vehicles (ROVs), or towfish, using the phase-differencing method. Transponders contain several transducers separated by a short distance (the ultra-short baseline antenna). The transceiver calculates the angle to the transponder. Containing several transducers separated by a short distance (the ultra-short baseline antenna), the transceiver calculates the angle to the transponder.

A USBL transceiver is mounted on a vessel and uses acoustic signals to determine the distances and bearings to the tracking targets. The USBL transceiver measures the time from transmission of its acoustic interrogation signal until an acoustic reply from the transponder is detected and converts it to distance to the transponder.

Useful display tools, distance measurement tool, settings management tools, Increased positioning accuracy when interfaced with an internal or external computer network, Extensive system configuration options, Real-time multiple target tracking.

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### Specifications and Configuration Options

<table>
<thead>
<tr>
<th>OPERATING DEPTH</th>
<th>Delrin</th>
<th>Aluminum Alloy</th>
<th>Stainless Steel</th>
<th>Titanium</th>
</tr>
</thead>
<tbody>
<tr>
<td>R 48/78</td>
<td>200 m</td>
<td>200 m</td>
<td>200 m</td>
<td>200 m</td>
</tr>
<tr>
<td>R 42/65</td>
<td>200 m</td>
<td>200 m</td>
<td>200 m</td>
<td>200 m</td>
</tr>
<tr>
<td>R 18/34</td>
<td>200 m</td>
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<tr>
<td>R 18/34H</td>
<td>200 m</td>
<td>200 m</td>
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<tr>
<td>R 15/27</td>
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<td>R 12/24</td>
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<tr>
<td>R 7/17</td>
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<td>R 7/17D</td>
<td>200 m</td>
<td>200 m</td>
<td>200 m</td>
<td>200 m</td>
</tr>
<tr>
<td>R 7/17W</td>
<td>200 m</td>
<td>200 m</td>
<td>200 m</td>
<td>200 m</td>
</tr>
</tbody>
</table>

### Power Consumption

- **Stand-by Mode**: Laser Mode
  - **R 48/78**: 5 - 285 mW
  - **R 42/65**: 5 - 285 mW
  - **R 18/34**: 5 - 285 mW
  - **R 18/34H**: 5 - 285 mW
  - **R 15/27**: 5 - 285 mW
  - **R 12/24**: 5 - 285 mW
  - **R 7/17**: 5 - 285 mW
  - **R 7/17D**: 5 - 285 mW
  - **R 7/17W**: 5 - 285 mW

- **Listen Mode**: Laser Mode
  - **R 48/78**: 3.9 kbit/s
  - **R 42/65**: 3.9 kbit/s
  - **R 18/34**: 3.9 kbit/s
  - **R 18/34H**: 3.9 kbit/s
  - **R 15/27**: 3.9 kbit/s
  - **R 12/24**: 3.9 kbit/s
  - **R 7/17**: 3.9 kbit/s
  - **R 7/17D**: 3.9 kbit/s
  - **R 7/17W**: 3.9 kbit/s

### IWEX System

- **SINAPS**: Ethernet or RS-232, Ethernet connection
- **SiNAPS**: Ethernet or RS-232, Ethernet connection

### Housing Options

- **Delrin**
- **Aluminum Alloy**
- **Stainless Steel**
- **Titanium**

### Dimensions

- **Housing Total Length**
  - **R 48/78**: 385 mm
  - **R 42/65**: 385 mm
  - **R 18/34**: 385 mm
  - **R 18/34H**: 385 mm
  - **R 15/27**: 385 mm
  - **R 12/24**: 385 mm
  - **R 7/17**: 385 mm
  - **R 7/17D**: 385 mm
  - **R 7/17W**: 385 mm

### Weight

- **dry/wet**
  - **R 48/78**: 4500/5000 g
  - **R 42/65**: 4500/5000 g
  - **R 18/34**: 4500/5000 g
  - **R 18/34H**: 4500/5000 g
  - **R 15/27**: 4500/5000 g
  - **R 12/24**: 4500/5000 g
  - **R 7/17**: 4500/5000 g
  - **R 7/17D**: 4500/5000 g
  - **R 7/17W**: 4500/5000 g

### Internal AHRS

- **Internal Xsens® MTi AHRS (Attitude and Heading Reference System):** compensates the changes of roll, pitch, and heading.

### USBL Configuration

- **Internal USBL:** the transceiver is installed on the positioning target.

### Wake-Up Module

- **Inverted USBL:** the transceiver is installed on the vessel.

### Power Supply Options

- **External:** 24 VDC (12 VDC)
- **Internal:** 24 VDC (12 VDC)

### Rechargeable Battery

- **5 Ah or 10 Ah:**

### Operating Range

- **200 m:**
- **200 m:**
- **200 m:**
- **200 m:**
- **200 m:**
- **200 m:**
- **200 m:**
- **200 m:**
- **200 m:**

### Frequency Band

- **48 - 78 kHz**
- **42 - 65 kHz**
- **18 - 34 kHz**
- **15 - 27 kHz**
- **7 - 17 kHz**

### Transducer Beam Pattern

- **Horizontally omnidirectional**
- **Horizontally omnidirectional**
- **Hemispherical**
- **Hemispherical**
- **Hemispherical**

### Applications

- Fast short and medium range transmissions in horizontal channels.
- Long range transmissions in vertical and horizontal channels.
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### Contact

Contact EvoLogics for more information on device dimensions and weights, request a drawing if necessary.

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*Specifications subject to change without notice. © EvoLogics GmbH - March 2020*
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