Underwater cables
for oceanography & seismic systems
LEONI is a global provider of products, solutions and services for energy and data management in the automotive sector and other industries.

With the market Marine LEONI provides the customers with all the expertise of a global enterprise, focused on the needs of the shipbuilding industry. With an extensive portfolio of products and services LEONI will assist you across the entire lifecycle of your projects – worldwide.

As a strong partner, LEONI offers application-specific cable and cable system solutions meeting national and international standards. You can trust in the well-founded sector and product knowledge as well as many years of experience.

Your needs: Innovative quality products, proven and project-related system solutions, as well as highest availability and sustainable service management are matter of course for LEONI.

What sets LEONI apart:

Research & Development
We invite you to benefit from the globally interlinked know-how of the LEONI Group and the work done by our Corporate Research & Development department. By conducting research projects that transcend individual sectors we tap synergies within the group and thereby provide additional potential for innovation.

A high degree of vertical integration in cable production
This is something virtually no other cable manufacturer can boast: from ultra thin copper wire through to hybrid cable thick as an arm, everything is done in our own production plants. Optimized results are achieved by using components which are matching up.

Cable systems
We also offer ready-to-connect and ready-to-fit assembled cable systems and fully wired modules.

Global presence
We have our own production facilities in all of the world’s key industrial regions and are therefore always in close proximity to you.
LEONI offers cables for underwater applications that ensure interference-free telemetry of seismic activity on the seabed. In addition, the cables supply e.g. underwater robots with data and energy, both in fixed and mobile systems, i.e. also when a robot is pulled through water on the seabed.

Available are hybrid round cables, e.g. for a sonar system, for a scanning sonar, for electromagnetic measuring systems and for marine measuring applications. LEONI also develops underwater cables for the connection between lighthouse and land, trailing cables for offshore applications, underwater fibre optic cables with steel reinforcement and deep-sea cables.

Our technical competence

Which elements can we integrate into a towing and underwater cable?
- Power cores up to 6 kV
- Control cores, pairs, triples and quads
- Data elements up to Cat. 7
- Bus cable elements
- Fiber optic elements
- Air, gas and fluid hoses
- All kinds of screening elements
- Strength members – steel and aramid – up to a load of 100 kN
- Cross-linked and non cross-linked sheathing materials

Which cable characteristics can we realize?
- Standard towing cables up to a load of 100 kN
- Neutrally buoyant cables
- Floating cables
- Torque balanced cables
- Sea bottom layable cables
- Water blocked cables longitudinally up to 100 bars and transversally up to 5000 bars
- Hybrid cables
- Cable assemblies

On the following pages you will find some of our realized projects. All our cable solutions are individually designed and manufactured according to the customer special requirements.
**Hybrid round cable**
for a sonar system

**Underwater cable**
for the connection between a light house and the shore

**Hybrid round cable**

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**Description**

- Developed for the connection of a control unit with the lateral sonar of a submarine.
- It contains the power supply, which is screened separately, as well as three data wire pairs.
- The cable is exposed to a water pressure of up to 40 bars in the depth during a diving session.

- Designed for the connection between the shore and a light house.
- Due to the applied reinforcement by steel mesh wire the cable features a highly mechanical stability. This allows even installation in a stony riparian area without any problem.

- This is a new development especially for use in a float, in order to allow for deeply submerged submarines the communication from deep areas.
- For this purpose the float carries various sensors, which allow communication in different networks. In a modified version a civil application could be thinkable and will thus be offered for example to marine engineering institutions for platforms or other facilities.

- The cable also provides towing the float, besides the data transmission task and supplies the required energy.

**Fields of application**

- For outdoor
- For use in humid rooms as well as in sea- and brackwater
- For outdoor and underwater use
- For underwater applications with fiber optic element for data transmission and power supply

**Outer jacket**

- Polyether-Polyurethane
- Polyether-Polyurethane
- Polyether-Polyurethane

**Mechanical characteristics**

- Seawater resistant
- Transversally water blocked
- Halogen free
- Seawater resistant
- Seawater resistant
Hybrid round cables for a scanning sonar

The Scanning-Sonar head is an echo depth finder, which can cover a semi spherical area.

The sonar functions at a frequency of 200 kHz and can display depth profiles of large areas.

The cable adopts also the occurring towing forces by means of an aramid braid.

This partially longitudinal water tight cable provides power supply.

Even at damages of the outer cable jacket the function remains intact.

A tension-relieved hybrid design with aramid reinforced polyurethane double jacket.

Connected components, such as plugs, couplings and distributors remain undamaged at a water pressure of up to 60 bars (no water intrusion).

Developed for the connecting vessels with a pipeline inspection robot.

A tension-relieved hybrid design with aramid reinforced polyurethane double jacket.

- For outdoor and underwater use
- Hybrid round cable with tensile strength of min. 12 kN for pulling applications

Polyether-Polyurethane Polyether-Polyurethane Polyether-Polyurethane

- Seawater resistant
- Transversally water blocked

- Seawater resistant
- For flexible installation
- Tearproved

Fields of application

Outer jacket

Mechanical characteristics

Description

Round cable for an electromagnetic measurement system

Hybrid round cable for sea measurement applications

Courtesy of OKTOPUS GmbH

Courtesy of Wehrtechnische Dienststelle

Courtesy of Meerestechnik Bremen
**Towing cable**  
for offshore applications

**Underwater fiber optic cable**  
with steel reinforcement

**Deep sea cable**

<table>
<thead>
<tr>
<th>Description</th>
<th>This offshore cable connects a master station with a submarine hammer, which fixes mechanical elements at the sea ground.</th>
<th>A hybrid design with a fiber optics element and several copper conductors for the power supply of the optic-electric converters.</th>
<th>The deep sea cable is filled with a special gel. This ensures a form stable behavior at up to 500 bars lateral pressure.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Because of the high mechanical load, the cable features double outer jacket with embedded aramid mesh.</td>
<td></td>
<td>The cable has been installed already in the bay of Gdansk.</td>
<td></td>
</tr>
</tbody>
</table>
| **Fields of application** | For power and control supply | For fixed installation  
For outdoor and underwater applications | For research up to 5000 m water depth |
| | For fixed installation  
Installation in cable ducts and conduits as well as on cable racks or underground laying  
For a max. depth of 50 m under water (sea or fresh) | | |
| **Outer jacket** | Polyether-Polyurethane | Polyethylene (HDPE) | Reinforced Polyurethane sheath |
| **Mechanical characteristics** | Halogen free  
Sunlight resistant | Sea water resistant  
Longitudinally and laterally water resistant  
Oil, petrol, acid and leach resistant  
Crush resistant | Sea water resistant  
3.5 mill. bending cycles longitudinally and transversally watertight  
Pressure resistant up to 500 bars |
| **Approvals** | UL 1581, sec. 1200  
VDE 0472, part 815 | IEC 60794-3  
EN 187105  
DIN VDE 0888-3  
DIN VDE 0899 | |
Sales network Marine – worldwide

LEONI market Marine – centres of competence

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