Cables and system solutions for medical technology
LEONI is a global provider of products, solutions and services for energy and data management in the automotive sector and other industries. The value chain encompasses wires, optical fibers, standardized cables, special cables and assembled systems as well as intelligent products and smart services.

As an innovation partner and solutions provider, LEONI supports its customers with pronounced development and systems expertise. The group of companies, which is listed on the German MDAX, employs more than 86,000 people in 31 countries and generated consolidated sales of EUR 4.9 billion in 2017.
We effectively connect functions for better images, more movability, less weight and more patient comfort. We have been assisting in the development of ever newer medical devices for more than 35 years and provide the right connection to optimize the desired properties. We convey your ideas into the world of cabling and create reliable nervous systems that bring your innovations to life.

We appreciably translate our know-how into partnership-like collaboration, lasting quality and worldwide availability. As system partners, we will work with you in a development-supporting role and create the best connection for you based on your custom specifications. We will supply you with proven LEONI quality and flexible logistics concepts from 10 production locations in five different time zones.

We make targeted use of expertise for maximum safety, efficient treatments and accurate patient positioning. With perfectly matched software and hardware components, our healthcare robotics solutions make radiation therapy safer, more efficient and more user-friendly. The intuitively operable LEONI ORION system demonstrates the kind of innovative solutions with which we can support our customers when we combine our knowledge of medical technology applications with our many years of industrial robotics experience.

We will mould the future intelligently for increasing connectivity, digital transformation and smart solutions. We will shape the connectivity of medical devices and business models as well as digitalization with intelligent products and innovative solutions. With ‘passion for intelligent energy and data solutions’, we will be at your side in meeting the challenges of Industry and Health 4.0 in the future, too.
In skin-foam-skin extrusion, the transmission properties of our cables are optimized by means of an extremely stable and consistently structured dielectric. This makes very small diameters possible.

Structure, shielding and the materials used are crucial to the hygienic, mechanical and electrical properties of a cable. As a cables specialist, we have a comprehensive range of dedicated technologies and materials that optimize our cables for use in a device or near a patient – ranging from small jumper wires or a single fiber through to complex copper, fiber optic and hybrid solutions.

We custom-produce our cables and can integrate various types of conductors to provide reliable power, signal, data and light transfer as well as media hoses. Our highly miniaturized cables are available with single-core diameters of up to AWG 50.

For near-patient applications we offer biocompatible and lastingly sterilizable cables.
Linking functionalities
LEONI – the systems supplier

As a systems supplier, we support our customers as early as the development phase of their medical devices as well as design and manufacture the complex cable systems and ready-to-install subsystems for your products. Our system solutions for imaging processes support the device properties with their electromagnetic compatibility, mechanical resilience and reduced cable volume. The components we incorporate are approved to national or international standards as required. In addition to the wiring, we will fit your product with mechanical and electrical components as well as perform the final function tests in-house.

Cables and systems for endoscopy and inner body applications
Our solutions meet not only all the functional demands including geometry and component choice, but also the strictest requirements with respect to cleanliness during the entire manufacturing process. By using LEONI si-tec as jacket material and sealing of tricky spots, our cable systems for endoscopy can thus be steam-sterilized on a sustained basis.

Our production facility of endoscopy and inner body solutions is DIN ISO 13485 certified.
LEONI ORION
the intuitive and high-precision patient positioning system

The LEONI ORION patient positioning system for radiotherapy combines LEONI’s many years of experience in the industrial robotics and medical technology sectors.

LEONI ORION puts all software and hardware components into operation in perfect harmony:

- Intuitively operable software for flexible and easy use.
- A robot and a 3D camera system with real-time control for dynamic positioning in six degrees of freedom and accuracy down to less than 1 mm.
- Cobotics technology for one-to-one translation of the therapist’s manual guidance into the robot’s movement.
- An integrated tool changer for the patient table to significantly reduce the cycle time per patient.

LEONI ORION: Synchronicity with six degrees of freedom

More information on LEONI ORION
By being involved in the process of developing a device at such an early stage, LEONI can specify cable systems with integrated components in the best possible way and minimize interference on the wiring.

Ready-to-install cable systems by LEONI support the long-term mobility of the devices. Fitted with a cable reservoir or spring return system, they can reduce the tensile force on individual cables. In combination with customized hybrid cables, LEONI cable systems form the electrically and mechanically stable transmission channels for your medical devices.

Cables and cable systems by LEONI provide you with:

- **Reliability and image quality** thanks to interference-free transmission
- **Durability** thanks to mechanical resilience
- **Flexibility** thanks to innovative cable routing
- **Mobility** thanks to a reduced cable volume

The components of our cable systems are approved in accordance with national or international standards. We can thus draw upon more than 700 different UL AWM styles.
for highly specialized applications

**Diagnostics**
Highly flexible cables and cable systems transmit interference-free image data for excellent recording quality.

- X-ray
- Mammography
- Computer tomography (CT)
- Magnetic resonance tomography (MRT)
- Ultrasound/sonography
- Molecular imaging/nuclear medicine
- Endoscopy
- Catheter technology
- ECG, EEG, MEG
- Laboratory technology
- Dental technology

**Therapy**
Greatest patient comfort and user-friendly handling for minimally invasive interventions.

- Radiotherapy
- Laser medicine
- High-frequency surgery
- Robot and computer-assisted surgery (CAS)
- Laparoscopy
- Catheter technology
- Intracorporeal systems
- Extracorporeal support systems
- Dental technology

**Patient monitoring**
Long-life, robust cables ensure reliable monitoring.

- ECG
- Oxygen measurement
- Temperature measurement
- Blood pressure measurement

More solutions for laser medicine and endoscopy applications under:
www.leoni-fiber-optics.com
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… in near-patient medical application

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www.leoni-fiber-optics.com

www.leoni-telecommunication-systems.com
Development work on the cable and system will focus on differing properties depending on the later application. We develop our products in an application-oriented way for our customers and optimize them in terms of hygienic, mechanical and electrical properties:

- lightweight and space-saving with small outer diameters down to AWG 50
- highly flexible, abrasion-proof, long flex life, torsion resistant and drag chain compatible with several million flex cycles
- crush and tension resistant
- low noise, electromagnetically compatible (EMC) and anti-magnetically shielded
- high voltage-resistant
- resistant to oil and chemicals
- wipe disinfectable for the cleaning methods commonly used in hospitals
- autoclavable
- skin compatible and biocompatible pursuant to various classes through to USP Class VI and DIN ISO 10993
- UL and CSA certified
**Expert and reliable**
in endoscopy and inner body applications

**Reliability**
thanks to interference-free signal transmission

**Image quality**
thanks to harmonized system components

**User friendliness**
thanks to extreme mobility

**Patient comfort**
thanks to miniaturization, skin compatibility and sliding capacity

**Patient safety**
thanks to optimized image transmission

**Hygiene**
thanks to long-term sterilizability and tight connections

**Our silicone cables are:**
- REACH (SVHC) compliant
- latex free
- BSE/TSE compliant (no animal products)
- free from phthalates, Bisphenol A

In addition to silicone, we also process a large number of other biocompatible materials.

Having an extensive range of technologies and materials, LEONI can optimize its cables and cable systems for subsequent non-invasive, minimally invasive or invasive use.

LEONI thus makes its customised cables and cable systems not only with minimal dimensions. The cable surfaces also support the patient safety and ease-of-use of medical systems.

With LEONI si-tec, LEONI gives biocompatible silicone cables improved gliding ability, which lasts across numerous autoclave cycles.

Our production facility of endoscopy and inner body solutions is DIN ISO 13485 certified.
Reliable service right from the start

From consulting and development support for optimum cable layout and material selection to cable routing and build-to-print and through to component assembly as well as customized logistics plan. We offer you all our know-how to optimize your products.

As a systems supplier we support the manufacturers of medical devices and systems as early as the development process, designing the best possible cabling for their products or supplying individual components – from a small jumper wire through to ready-to-install subsystems.

We also offer the individual work steps to manufacture our products as a service to our customers.
Addon services
Fast, flexible and sustainable

Consulting, engineering & design
We can draw on many years of experience when planning the best possible and most stress-free cable routing and offer this know-how to our customers as a service. Alternatively, the routing and the design of the cable harnesses is done in the prototype of a device or in a 3D model.

Rapid prototyping of overmolded components
We use additive manufacturing to rapidly, flexibly and cost-effectively produce injected-molded prototypes or small-scale production runs. With this service, we offer our customers overmolded components in the shortest possible time to test the suitability for mass production of certain geometries. This process also allows adjustments to be made quickly and easily.

System verification
We also conduct customer-specific tests in addition to comprehensive electrical, thermal, chemothermal and mechanical standard tests of our products. This involves our cable systems being fitted to device prototypes. We can also design and build our own testing apparatus to be able to simulate the subsequent flex requirements on our connections at the outset and to document their resilience.

The standard tests of our products comprise i.a.:
- High voltage and insulation testing
- Length testing
- Fiber bundle testing
- Crimp height and microsection testing
- Pin assignment testing (2 and 4 pole measurement)
- Function and component testing with cable systems
- Propagation delay measurements
- Tensile strength testing
- Drag chain tests
- Torsion and flex cycle tests
- Tests on tightness of moulded parts
Quality and environment
on that you can rely

**LEONI quality management**
Consistently high quality is indispensable for our products. At LEONI, the entire process from planning through to completion of a product is subject to constant monitoring. Our quality management system is DIN ISO 9001 – and some cases DIN EN 9100 and DIN ISO 13485 – certified and is continuously monitored.

All cable systems that leave our production lines have previously been 100% tested. Furthermore, we can run mechanical and thermal tests as well as customer-specific testing and measurement methods. For the manufacture and sale of products for the North American market we can also draw on more than 700 different UL styles.

**LEONI energy management**
Sustainable action will secure the future of our company. In line of economic, environmental and social requirements, we take our social responsibility. We are committed to the continual improvement of energy efficiency and sustainable resource utilization.

**LEONI environmental management**
Environmental protection is a mandatory element of our business activity. We ensure, with our DIN EN ISO 14001 certified environmental management system, that our environmental policy is applied effectively.

Well-known OEMs have on multiple occasions already commended our LEONI as supplier of the year.
Our best recommendation: satisfied customers

An abstract of our current customer portfolio.

Convincing product properties and quality, which ensure an “enduring solution”, partnership-like collaboration and customer-oriented service are the basis of our partners’ satisfaction. We urge you, too, to discover the merits of a portfolio that offers you the best solution for any application.

Do familiarize yourself with a value chain that will support you perfectly at all levels from the consultation through to a dedicated logistics concept.

At LEONI, proximity to the customer means not only aspiring to be very close to the wishes and requirements of our partners, to understand and realize them. To us it also means being exactly where our customers are and need us. Not least for this reason, we have in recent years systematically expanded our global network of production and distribution facilities and are now available to our customers in five time zones, covering everything from engineering to the finished product.

LEONI’s solutions for Healthcare are produced in Germany, Slovakia, Canada, Mexico and China. We also operate with sales offices worldwide.

Our global network enables us not only to respond quickly and effectively, but also makes LEONI an attractive partner worldwide for our global customers. Common systems and processes as well as clear objectives and shared values ensure the highest standards and are maintained without compromise at LEONI.

You will find more detailed contact information of our international partners at: www.leoni-healthcare.com
Expertise worldwide
always near to you

LEONI's global Healthcare footprint:
- Production facilities
- Sales offices
- Engineering facilities

Germany
- LEONI Special Cables GmbH, Friesoythe
- LEONI Kabel GmbH, Roth
- LEONI elocab GmbH, Georgensgmünd
- LEONI Fiber Optics GmbH, Neuhauß-Schierschnitz

France
- LEONI CIA Cable Systems S.A.S., Chartres
[Center of competence LEONI ORION]

Slovakia
- LEONI Slovakia spol. s r.o., Stará Turá

Canada
- LEONI Elocab Ltd., Kitchener

USA
- LEONI Cable Inc., Rochester

Mexico
- LEONI Cable S.A. de C.V., Apaseo el Grande

China
- LEONI Cable (China) Co., Ltd., Changzhou
- LEONI Cable (China) Co., Ltd., Shanghai

India
- LEONI Cable Solutions (India) Pvt. Ltd., Pune

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LEONI Cable (China) Co., Ltd.
Responsible for imaging, dental and special solutions

Responsible for endoscopic, inner body and aesthetic solutions