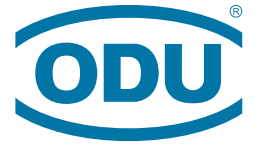


A PERFECT ALLIANCE.

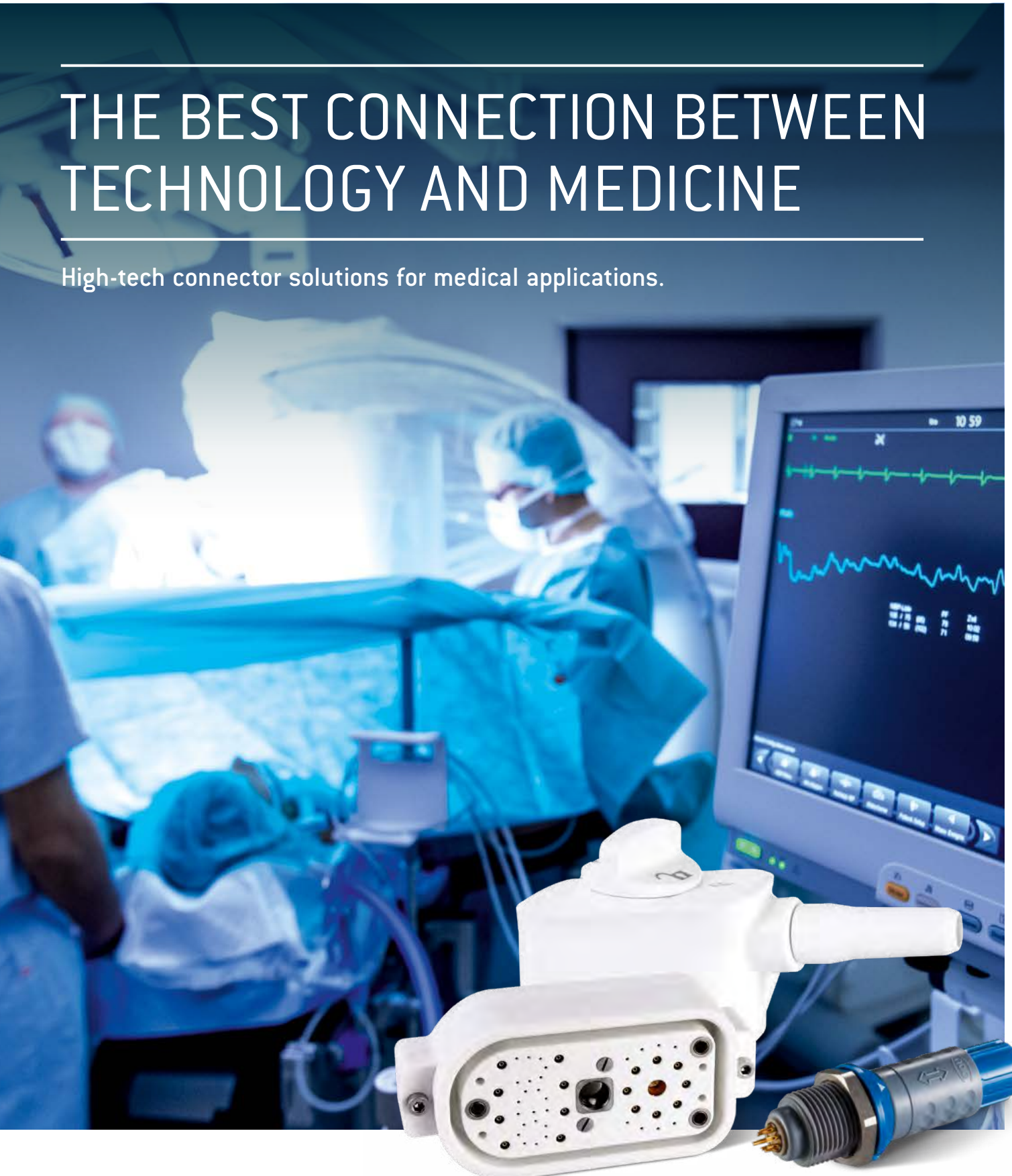


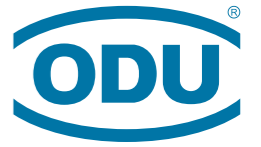
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# THE BEST CONNECTION BETWEEN TECHNOLOGY AND MEDICINE

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High-tech connector solutions for medical applications.





A PERFECT ALLIANCE.

## THE CONNECTOR SPECIALIST

# INNOVATION AND EXPERTISE FOR CUTTING-EDGE MEDICAL TECHNOLOGY

In the world of modern medicine, new possibilities are arising at lightning speed – with demands on the respective technology increasing just as quickly. And, just like existing applications, each and every innovation must guarantee the highest level of security along with a wide range of benefits.

ODU has been providing time-tested connector technology and innovative customized solutions for decades now. Leading medical technology manufacturers know they can count on our expertise as a globally active partner – because when it comes to interfaces for medical applications, we know exactly what we are talking about. ODU products offer consistent failure protection and the dependable transmission of signals, power, data, and media such as air, liquids or even light waves. They are also the perfect solution for a variety of applications in the daily medical environment: highly functional, robust technology ideally suited to high-hygiene environments and heavy-duty use – but always user-friendly and easy to operate.

**ODU IS YOUR DEPENDABLE PARTNER FOR FUTURE-FOCUSED MEDICAL TECHNOLOGY WITH PERFECT CONNECTIONS – FOR DIAGNOSTICS, TREATMENT, HYBRID OPERATING ROOMS AND PATIENT MONITORING.**

### YOU CAN COUNT ON IT

Upon request, ODU is able to meet the high quality requirements of the EN ISO 13485 international standard as well as the IEC 60601 series of technical standards for the medical field. We strive to provide all our customers with a solid foundation for an ideal partnership.



All dimensions are in mm.  
Some figures are for illustrative purposes only. Subject to change without notice. Errors and omissions excepted. We reserve the right to change our products and their technical specifications at any time in the interest of technical improvement. This publication supersedes all prior publications. This publication is also available as a PDF file that can be downloaded from [www.odu-usa.com](http://www.odu-usa.com).

# SPECIAL REQUIREMENTS REQUIRE SPECIAL KNOW-HOW

ODU's state-of-the-art precision connectors and reliable connector technology are available for a wide range of medical applications: in the hospital environment, the doctor's or dentist's office, or in home health care.



## RELIABLE EVERY TIME

Thanks to their outstanding contact security even in highly demanding environments, ODU connectors ensure the reliable transmission of data, power, medical gases and fluids.

Our high-quality interfaces provide the perfect contact technology for a wide range of applications and stringent requirements.

- Very high contact security for over 100,000 mating cycles
- 100% non-magnetic options also available
- Corrosion-resistant
- Long service life
- Reliable data transmission



## EASY, SAFE HANDLING

The handling of the connectors is simple, user-friendly and safe: The locking mechanism in the docking area is easy to use for both staff and patients.

- Simple, ergonomic connection
- Automatic, user-friendly docking systems for mobile devices
- Maintenance-free operation
- Touch protection – can be made to comply with VDE/UL
- Maximum patient safety ensured
- Variety of locking systems



## HIGHLY HYGIENIC

The connectors, cables and housings are all sterilizable and autoclavable. They are highly resistant to temperature and chemicals and guarantee the highest level of tightness.

- Sterilizable and disinfectable
- Autoclavable up to 121 °C
- Chemical resistance to detergents and disinfectants
- Easy-to-clean housings and surfaces

# DEPENDABLE TECHNOLOGY — PERFECT CONNECTIONS

Medical applications, more than any other area, require the highest degree of precision, dependability and security in each and every component. Our sophisticated technology and diversified expertise provide a firm foundation for the customized development of first-class connectors for the entire medical technology sector.

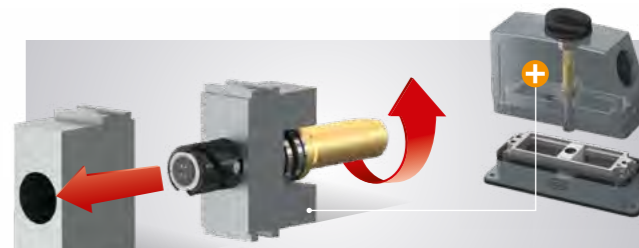


## PUSH-PULL LOCKING



Quick, secure connections: The automatic locking system prevents the connection from inadvertently demating, even when there is a pull on the cable. Demating can only occur when the user intentionally pulls back the outer sleeve of the connector – which is quick and easy.

## SPINDLE LOCKING



This user-friendly quick-lock system enables easy, ergonomic handling of high-pole interfaces. A large variety of customized connector systems are available, including systems allowing for the retroactive front-side changing of the spindle head.

## 100% NON-MAGNETIC



To guarantee the non-magnetic nature of components, single products and all-in-one systems, ODU submits them to a meticulous inspection. In addition to the usual control measures, a patented in-house magnetic testing technology is applied.

## HIGH-SPEED DATA TECHNOLOGY

HDMI<sup>®1</sup>, USB<sup>®</sup> 2.0<sup>1</sup>, USB<sup>®</sup> 3.1 Gen<sup>1</sup>, FireWire<sup>®1</sup>, Ethernet<sup>1</sup>, eSATA<sup>®1</sup>

ODU offers innovative, functionally secure solutions to meet modern high-speed data transmission requirements. We guarantee the very best contact and transmission security in high-frequency transfer – whether for analog or digital signals.

## HIGH-DENSITY TECHNOLOGY



The growing trend toward miniaturization is particularly applicable to medical technology, and ODU's high-density technology offers the greatest number of contacts possible in the smallest amount of space. Despite their small footprint, the contacts' dependability and robustness are guaranteed.

## TIGHTNESS THROUGH GLASS POTTING



Stringent tightness requirements – such as hermetically sealed optics and electronics of endoscopes – are met through “glass-potted” solutions. The technology's added benefits: a long service life, high number of autoclave cycles and robust materials.

## CUSTOMIZED SOLUTIONS



For particularly challenging areas of medical technology, accurately fitting custom solutions are absolutely indispensable – and ODU is your perfect partner: We provide application-specific, customized solutions, developing them in close coordination with our customers down to the very last detail.

## CABLE ASSEMBLIES AND COMPLETE SOLUTIONS



As a provider of systems and complete solutions, ODU offers first-class customized cable assembly, even in cleanroom conditions. Appliance tubes, cables and plugs are manipulated in a clean, space-saving manner, and interfaces are always reliably configured.

<sup>1</sup> These ODU specific connectors can transmit common data transmission protocols such as USB<sup>®</sup> 3.1 Gen 1, USB<sup>®</sup> 2.0, HDMI<sup>®</sup> 2.0, Ethernet, CAT5, CAT6A, FireWire<sup>®</sup> and eSATA<sup>®</sup>, but they are not USB<sup>®</sup>-, HDMI<sup>®</sup>-, Ethernet-, CAT- and eSATA<sup>®</sup>-standard connectors.



## WE WORK FOR THE BEST – ALL AROUND THE WORLD

We nurture a customer-centric mentality, continuously meeting the most demanding requirements. Which is why a large number of medical technology manufacturers and industry leaders put their trust in our excellent products and connector solutions.

## MANY WELL-KNOWN CUSTOMERS RELY ON ODU

(A SELECTION FROM OUR CUSTOMER PORTFOLIO)

... ALCON · GE HEALTHCARE · HEWLETT-PACKARD · KAVO · METRAX · MTS · NSK · OLYMPUS · PARI · PENTAX · PHILIPS · Q-CORE · ROCHE · SIEMENS · RAPID BIOMEDICAL · SIRONA · STEUTE · STRYKER · TOSHIBA · UNITED IMAGING · WILAMED ...

## A GENUINE PARTNERSHIP FOR TRUE ADDED VALUE

Thanks to its extensive expertise in customized connector systems and specialized applications, ODU has become a renowned partner within the medical technology industry – our name is synonymous with dependability, security and the utmost in precision. Through close, goal-oriented collaboration with our customers, we develop the right technology whose product-specific design provides the ideal application solution. For perfect connections.

## IN THE WORDS OF OUR SATISFIED CUSTOMERS

“ In magnetic resonance imaging (MRI), it is imperative for the connectors we use to guarantee a high number of mating cycles while being absolutely non-magnetic. Besides standard coils for clinical use, RAPID Biomedical regularly develops client-specific solutions for research whose requirements far exceed the usual. It is especially in cases such as these, when special solutions are needed, that ODU supports us with the necessary technical flexibility and problem-solving expertise.”

Dr. Florian Odoj, CEO, RAPID Biomedical GmbH

“ Thanks to reliable ODU connections, MARI can facilitate highly complex operations.”

Dr. David Pitskhelauri, internationally renowned neurosurgeon

“ Ultimately, it was ODU's ability to adapt existing connector systems to client-specific needs which enabled the successful implementation of our project.”

Hiroshi Hidaka, K.MEC Co. Ltd.


# RELIABLE RESULTS CREATE TRUST

When it comes to connector technology and interface solutions, all medical areas and applications require a perfect fit. This is the case for specific technical functions, but it also applies to product design, safe operation and much more.

Today more than ever, modern clinics and medical centers must rely on the most cutting-edge technical equipment. Medical specialists at hospitals in the Mühldorf am Inn district have access to an impressive selection of powerful, state-of-the-art medical applications. This level of expertise combined with the very latest technology ensures first-class quality for outstanding medical facilities.

ODU OFFERS SOLUTIONS FOR:

- + TREATMENT/SURGERY
- + DIAGNOSTICS
- + PATIENT MONITORING
- + OUTPATIENT TREATMENT
- + HOME CARE

THE FOLLOWING PAGES OFFER  
A VARIETY OF CASE EXAMPLES 



## HIGH-TECH CONNECTIONS IN ADVANCED MRI SYSTEMS

Magnetic resonance imaging (MRI), as depicted here in the Mühldorf District Hospital, is an imaging technology for medical diagnostics. All leading manufacturers worldwide use the ODU-MAC system as the reliable interface between various patient coils and the MRI machine. Ease of operation and non-magnetic materials are essential for these types of applications.



ODU MRI COIL CONNECTOR

- + 100% non-magnetic
- + Large number of mating cycles and continuously high transmission quality
- + Ergonomic, intuitive locking systems
- + Complete system solutions



### AUTOMATIC DOCKING SYSTEM

ODU's integrated docking system enables an almost automatic connection between the patient table and all its contacts and the MRI system – ensuring safe, seamless processes when switching between patients. It also offers a very high number of mating cycles for the continuous reliability required in everyday medical procedures.



### SPINDLE LOCKING FOR EASY USE

The user-friendly spindle locking system provides both visual and tactile feedback, thereby clearly indicating its locking status at all times. An "emergency release" function can also be integrated if desired.



### 8-CHANNEL CERVICAL SPINE ARRAY

This 7T-array enables high resolution imaging for cervical spine diagnostics. Its 8 channels can be controlled both individually (parallel transmit) or together (combined mode), thanks to a special interchangeable interface.

## CUTTING-EDGE DIAGNOSTICS MEAN CUTTING-EDGE TECHNOLOGY, TOO

Magnetic resonance imaging (MRI) results from the protons in the water within a patient's body being impacted by a very strong static magnetic field. A pulsed HF magnetic field is irradiated via an HF coil to stimulate the protons. When the HF magnetic field is turned off, the protons send out small magnetic signals which are then registered by means of special patient coils. These signals ultimately generate the desired sectional image.



Picture: PHILIPS

ODU MRI COIL CONNECTOR

### CONNECTING THE COIL WITH THE MRI SYSTEM

- Excellent image quality through high contact security
- Customized solutions in a compact plastic casing
- HF transmission via coax and **new trailblazing solutions**
- Solutions for **digital transmission via fiber optic cables** (GOF/POF)



### IDEAL HF TRANSMISSION

Perfect data transmission – completely free of errors, shadows or spots – is indispensable when it comes to imaging techniques. Depending on the nature of the examination, the contacting occurs with the MRI device through the various patient coils and is carried out via application- and device-specific connectors developed by ODU.



Picture: SIEMENS

### APPLICATION-SPECIFIC SOLUTIONS AND CUSTOMIZED DESIGNS

ODU offers customized connector, cable and system solutions to meet the requirements of a wide variety of applications and systems.



Picture: Mammendorfer

### MRI-COMPATIBLE PATIENT MONITOR

This patient monitor was specifically developed for use in an MRI environment. The secure transmission of vital signs, as well as alarm signals and events, is ensured through a specific technology.



## MOBILE X-RAY MACHINES

For X-ray imaging, interfaces must be flexible, compact and safe. The modular ODU-MAC system provides an ideal interface between the mobile X-ray machine (C arm) and monitor cart, reliably establishing the required connection for high power, data and signal transmission with one single plugging step.



### SAFE HANDLING

The spindle locking of the ODU-MAC provides additional operational safety. Thanks to audio, visual and tactile feedback, the locking status is clearly recognizable at all times.



### MODULAR VARIETY

A smart way towards customized connectors. No matter what needs to be transmitted – signals, power, data rates, media such as air and liquids, or even light waves – ODU-MAC systems can do the job. They enable a wide variety of interfaces to be configured, variably and precisely, to meet your specific application needs.

- + **Wide variety of modules** to fit any possible application
- + **Hybrid solutions** thanks to modular system
- + Robust, maintenance-free **solutions for everyday clinic operations**
- + Reliable **long-term solutions**

Picture: TOLUKETY

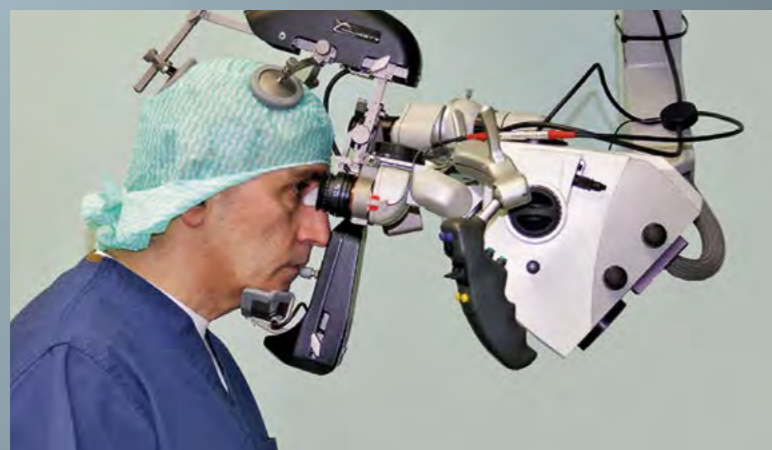
## HANDS-FREE NEUROSURGICAL MICROSCOPE

This device is navigated around the operating table through movements of the surgeon's head. The optical parameters are controlled by the surgeon's lips. ODU connectors and device-specific cable assemblies ensure the reliable transmission of power and signals between the control device and the control system.

- + ODU MINI-SNAP Push-Pull connectors with 6 different cable assembly varieties
- + Contact security for dependable use
- + Up to 5,000 mating cycles
- + Autoclavable
- + Protection class IP 68



ODU MINI-SNAP®



## MULTI-THERAPY INFUSION SYSTEM

An all-in-one solution for a wide range of clinical and outpatient applications. High-end functions of volumetric infusion pumps ideally combined with a complete device which is light and compact.

- + Push-Pull locking for quick, easy mating and demating
- + High chemical resistance
- + Lightweight



ODU MINI-SNAP® PC



## FETAL DOPPLER AND HAND-HELD PULSOXYMETER

Whether for measuring fetal heart rate in the mother's womb using the fetal Doppler or for monitoring pulse frequency and oxygen saturation in children and adults via a hand-held pulsoxymeter. The ODU MEDI-SNAP always ensures a secure interface between the device and the sensor.

- + Color keying
- + Autoclavable and sterilizable
- + Rugged design



ODU MEDI-SNAP®



# INHALERS

ODU has developed an application-specific system solution for an inhalation device. With its hermaphrodite design, it can be used for respiratory therapy in newborns, among other applications. ODU's connector solution forms the interface between the control unit and the nebulizer of this device.

- + System solution including assembly
- + Customized, compact design
- + Low mating and demating forces



## RESPIRATORY GAS HUMIDIFIER

In artificial respiration, this device supplies the patient with conditioned respiratory gas for relieving the respiratory tracts. ODU has supplied the interfaces between the respirator, the respiratory gas humidifier and the patient: 2 ODU MEDI-SNAP connectors including cable assembly.

- + High **chemical resistance**
- + Protection class **IP 64**
- + Casing with **100% touch protection**



ODU MEDI-SNAP®



Picture: WILAMED

## SPARKWAVE® THERAPEUTIC DEVICE

This therapeutic device is used for the treatment of urogenital conditions. The ODU-MAC connector inside the device ensures the secure connection between the device and the applicator, which sends out bundled sound waves. The device's sophisticated cable assembly is also an ODU product.

- + Extremely easy-to-change applicator via **fully automatic locking and unlocking function**
- + **Hybrid solution** with signals, high voltage and liquids
- + **System solution** including cable assembly



ODU-MAC®



## DENTAL MICROSCOPE

Dentistry covers a diverse range of treatments – and each and every technical device requires just as diverse a range of demanding components. For instance, connectors in dental microscopes must, of course, function reliably, but they must also be easily sterilizable or autoclavable, offer a compact, ergonomic design and guarantee consistently precise image transmission.



ODU MINI-SNAP®

## ULTRASONIC DENTAL SCALER

This innovative gingivitis prophylaxis machine uses the ODU MINI-SNAP PC connector with a customer-specific insert as an interface between the treatment tube and the device. This is a compact plug which combines water feedthrough, HV and signal contacts.

- + Customized contact configuration
- + Suitable for high voltage
- + Media feedthrough



ODU MINI-SNAP® PC



## MICROMOTOR SYSTEM FOR DENTAL SURGERY

This dental device is based on ultra high-speed turning technologies for sophisticated applications in dental surgery. The ODU MINI-SNAP provides the interface between the main part of the device and the handpiece.

- + Seamless handling thanks to adapted mating and demating forces
- + Customized design
- + Autoclavable



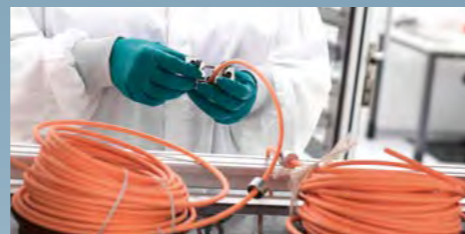
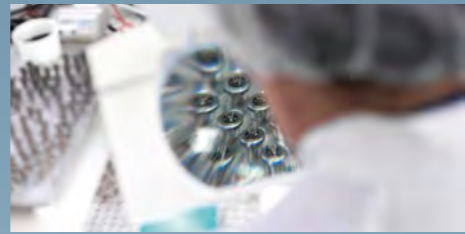
ODU MINI-SNAP®



For more applications, visit our website [www.odu.de](http://www.odu.de)

# A PERFECT ALLIANCE.

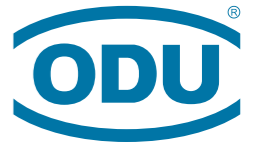
As one of the world's leading manufacturers of electrical connectors, ODU offers first-class products and services to meet the highest demands of the medical technology sector. We have operations both around the globe and around the corner – because being directly connected to our customers creates perfect connections in their products, too.



For specific medical requirements, ODU offers production in class 9 cleanrooms. We also provide a comprehensive sterile production environment all the way from production to assembly to packaging.

## CUSTOMIZED DEVELOPMENTS

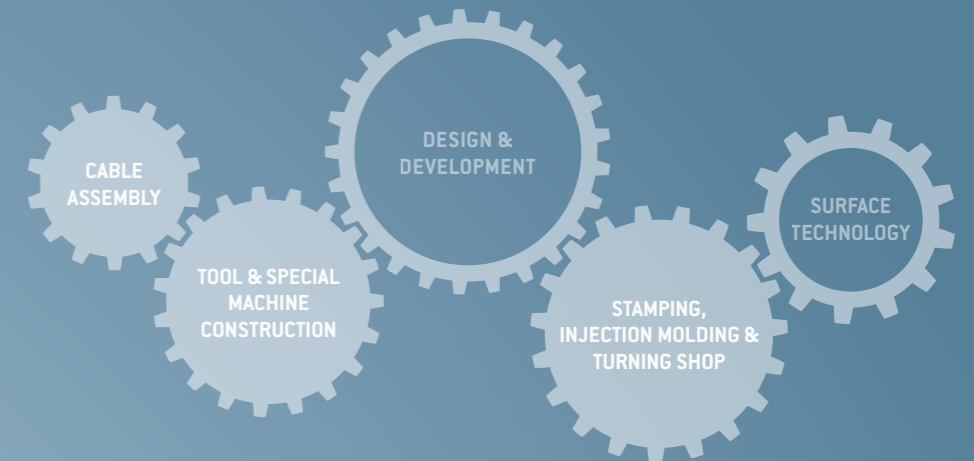
Innovative, reliable solutions to perfectly fit the customer's specifications – either based on ODU's time-tested product line or as a brand-new customer-specific application.



A PERFECT ALLIANCE.

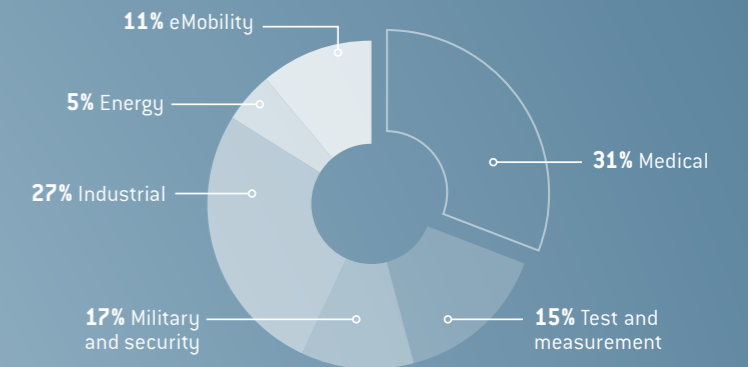
## HIGH LEVEL OF VERTICAL INTEGRATION

ODU consolidates all necessary expertise under one roof.



## CROSS-INDUSTRY KNOW-HOW

ODU has extensive expertise in a wide range of industries. This provides added value to our customers through a broad range of know-how and practical experience combined with significant business acumen and efficiency.



## CUSTOMER PROXIMITY ACROSS THE GLOBE

ODU has an international presence. Its company headquarters are located in Germany, with 9 sales subsidiaries in China, Denmark, France, Germany, Italy, Japan, Sweden, the UK and the US as well as 5 production and logistics sites.



## ADVANCED CONNECTOR SOLUTIONS FOR FUNCTIONAL DIVERSITY

A wide variety of connections for a wide range of requirements – whether for transmitting signals, power, data, media such as air (vacuum) and liquids or even light waves. Whenever top quality and reliability are indispensable, and customized, innovative solutions are required, ODU has the ideal interface to offer. Highly developed, broadly functional contact technology to meet the highest requirements of medical applications:



### ODU-MAC®

- Unlimited combinations of multiple supply lines available
- Compact and space-saving
- Up to 6,300 V, 20 bar, 10 Gbit/s and 9.0 GHz
- 30 different high-speed data technology inserts
- > 100,000 mating cycles
- Consistently low contact resistance
- Solutions for automatic docking and manual mating
- Blind plugging available

### ODU-MAC® MEDI-FLEX

- Attractive, ergonomic housing design
- Intuitive locking mechanism
- Resistant, easy-to-clean surfaces
- 100% non-magnetic version available

### ODU-MAC® ZERO

- Can be fitted with up to 9 units
- 3 different cable outlets: straight, 45° and 90°
- Compact, dynamic housing
- Biocompatibility for all touchable parts (nickel-free)



### ODU MINI-SNAP®

- Push-Pull locking for quick, easy mating and demating
- Metal housing
- 8 different sizes
- 2 to 40 contacts
- Protection class IP 50 to IP 68
- Up to 5,000 mating cycles
- Autoclavable

### ODU MINI-SNAP® PC

- Push-Pull locking for quick, easy mating and demating
- Plastic housing
- 3 different sizes
- 2 to 27 contacts
- Protection class IP 50 to IP 67
- Autoclavable
- Shielded version available

### ODU MEDI-SNAP®

- Push-Pull locking for quick, easy mating and demating
- Plastic housing
- 2 different sizes
- 2 to 26 contacts
- Protection class IP 50 to IP 64
- Up to 2,000 mating cycles
- Autoclavable and sterilizable
- Color-coding option
- Disposable options available
- Rugged design



### ODU MINI-MED®

- Snap-In locking for Break-Away function
- Plastic housing
- 1 size
- 2 to 6 contacts
- Protection class IP 67
- > 1,000 mating cycles
- Compact design



### ODU AMC® HIGH-DENSITY

- Snap-In locking for Break-Away function
- Metal housing
- 4 different sizes
- 2 to 40 contacts
- Protection class IP 68
- Up to 5,000 mating cycles
- USB® 2.0<sup>1</sup>, USB® 3.1 Gen1<sup>1</sup> and HDMI<sup>®1</sup> data transmission
- Miniature dimensions
- Rugged design



### ELECTRICAL CONTACTS

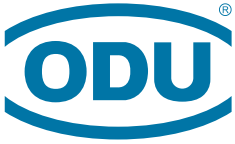
- More than 100,000 mating cycles (patented springwire technology)
- Low mating and demating forces
- Low contact resistance
- Up to 2,000 A current-carrying capacity
- High vibration resistance and low wear

<sup>1</sup> These ODU specific connectors can transmit common data transmission protocols such as USB® 3.1 Gen1, USB® 2.0 and HDMI®, but they are not USB®- and HDMI®-standard connectors.



### CABLE ASSEMBLY

- Complete systems from a single source based on years of assembly expertise
- State-of-the-art production facilities with 100% end testing, high-voltage testing, component testing and pressure testing up to 100 bar
- Cleanroom production
- Hot-melt and high-pressure injection molding
- Customer-specific labeling
- Rapid prototyping of samples



A PERFECT ALLIANCE.

## ODU GROUP WORLDWIDE



### ODU USA

#### ODU-USA, Inc.

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www.odu.de

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<b>Germany</b>	Otto Dunkel GmbH
<b>China</b>	ODU (Shanghai) Connectors Manufacturing Co. LTD
<b>Mexico</b>	ODU Mexico Manufacturing S.R.L. de C.V.
<b>Romania</b>	ODU Romania Manufacturing S.R.L.
<b>USA</b>	ODU-USA, Inc. ODU North American Logistics

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#### Further information and specialized representatives can be found at:

www.odu-usa.com/contact



Simply scan the QR code to download the entire brochure.

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