

# THE CONNECTOR

## TRANS- FERRING DATA **SAFELY**

Safe interfaces for  
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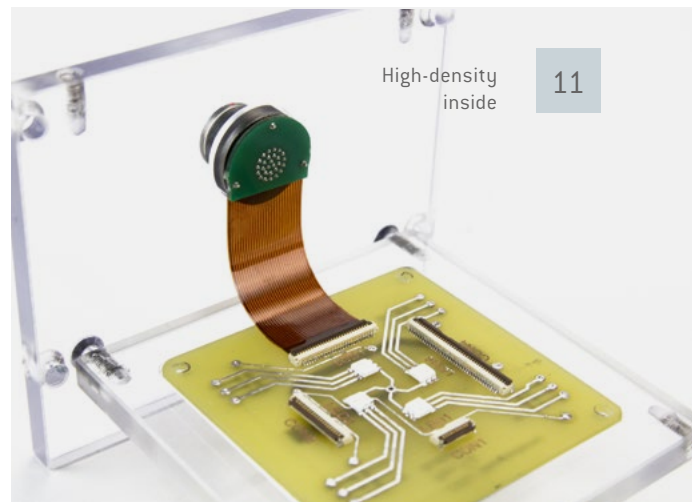
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High-density inside

Dear customers, suppliers and partners of ODU,

As a connector manufacturer whose products are usually clearly visible on our customers' products, i.e. somewhere outside the devices, we don't usually think about what's inside. And yet: What connector solutions are hidden inside the housing? Especially when it comes to high data rates, multi-contact connectors are used to transfer data from device parts/couplings to the electronics. This is similar to how nerves connect with the brain.

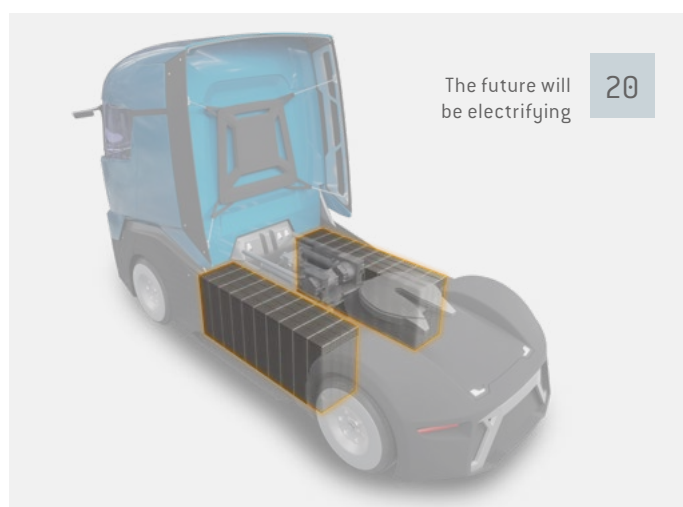
ODU offers many solutions for this, especially in PCB technology – whether flexible conductors, rigid-flex solutions or via printed contacts directly into the PCB. We invite you to test our standard solutions and will be happy to design

your customized, topography-oriented solution. We can use your Gerber data or create the Gerber data for you and deliver pre-assembled device parts.

You'll find information on this and many other exciting topics around high data rates, complete cable assemblies and new connector solutions in this 92nd issue of THE CONNECTOR.

Best regards,

Denis Giba  
ODU Managing Director



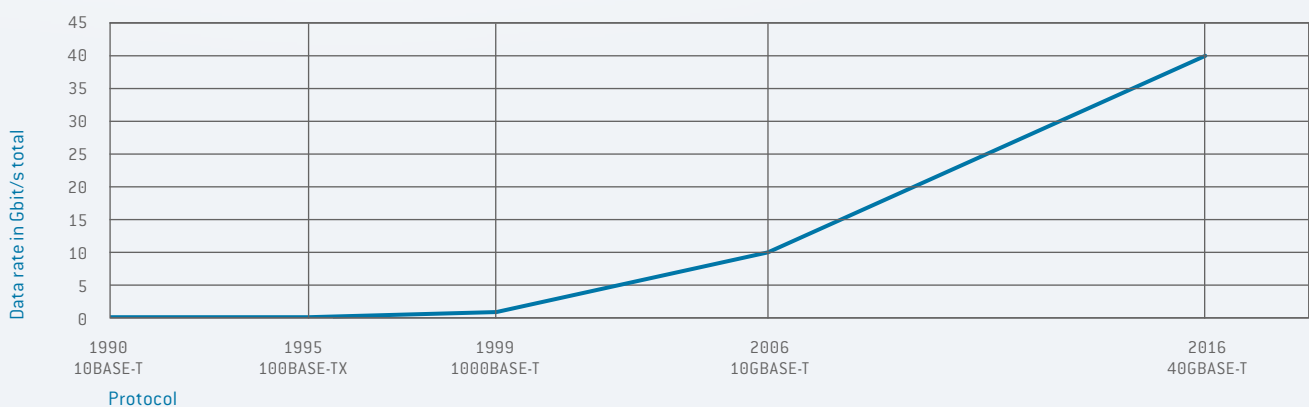
# SAFE TRANSPORTATION of valuable CARGO

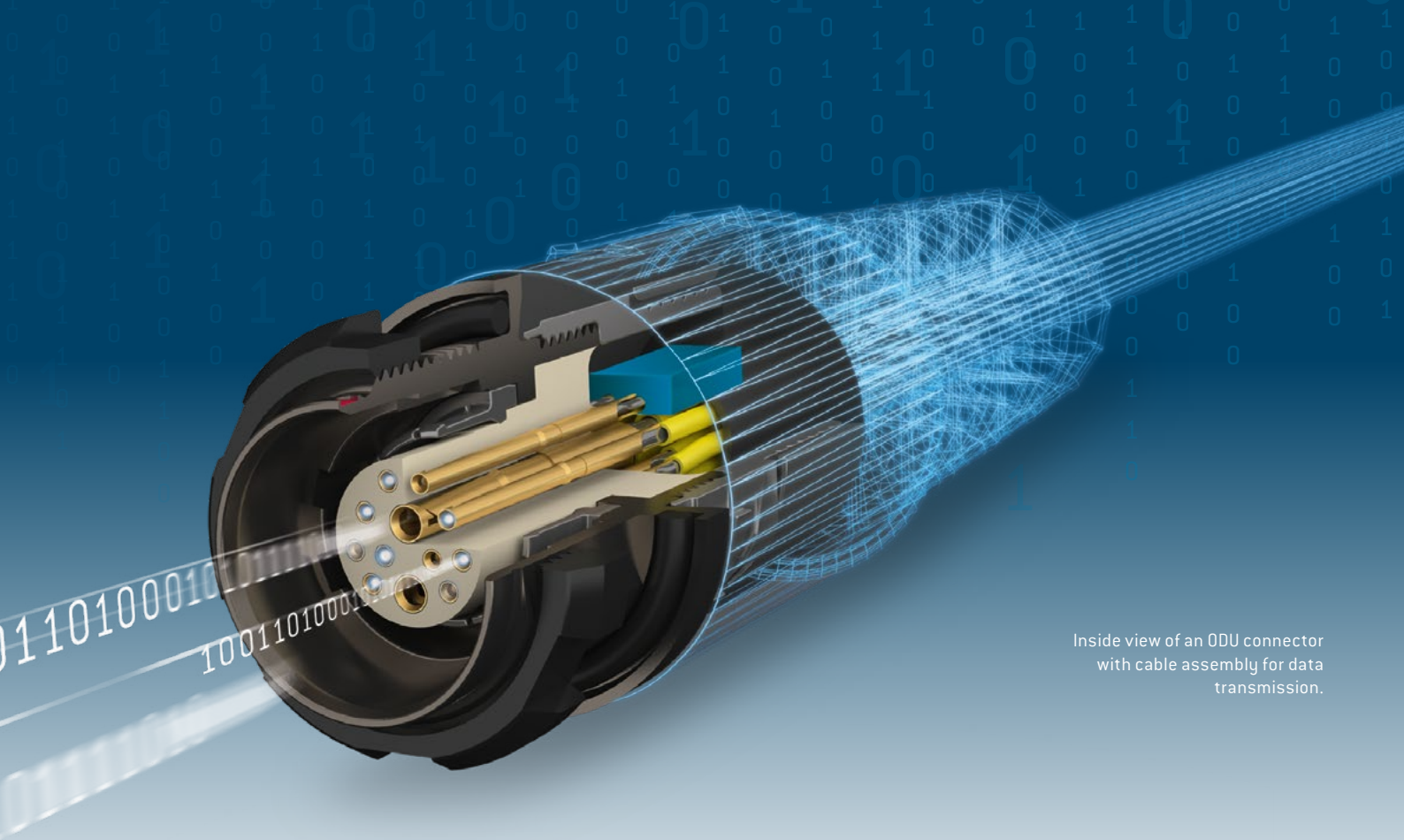
Since the late 20th century, data has become increasingly important and valuable, and a symbol of digital transformation. In the context of Industry 4.0 and the Internet of Things (IoT), data is even referred to as the gold of the digital age. Data transfer is one of the cornerstones of this development. Without the ability to exchange information between two or more senders and receivers, digitalization could simply not advance.

The performance of the transmission link (consisting of the cable, connector and other components) via twisted pair cable is classified into categories according to ISO/IEC 11801 or EN 50173. Based on the IEEE Ethernet cabling standard (see diagram below), one can clearly see the increasing demand for data volume:

## Transmission line performance

Development of data rates based on Ethernet cabling standards:





Inside view of an ODU connector with cable assembly for data transmission.

Where copper cables reach their physical limits, fiber optic technology offers many advantages. These include:

- Transmission range
- Weight reduction
- EMC compatibility
- Scalability
- Package density

And the resulting possibilities seem almost endless. Thanks to enormous transmission speeds with low latency, it is now even possible for a specialized doctor to perform complex surgery over long distances and across spatial boundaries. Obviously, this is a case where the demands are very high and the data transfer must have no limitations or delays. Even though the data transfer could in principle take place both wirelessly via radio links or wired via cables, the above example illustrates why wired transmission still dominates in industrial environments. Fiber optic solutions are reliable, fast and rarely susceptible to interference.

In combination with the appropriate cables, ODU Fiber Optic products enable reliable and constant signal transmission.

As a specialist in the field of connectors and ready-made system solutions, ODU has been at the forefront of technological developments for more than 80 years – with the aim of always offering customers the right product. As a result, the company provides state-of-the-art connectors and cable assemblies for loss-free transmission – for electrical signals as well as fiber optic signals and other media such as air or liquids. Transmission is also dependent on a high-quality cable assembly that enables an ideal interaction between the connector, the cable and the connection.

# TESTED DATA TECHNOLOGY ASSEMBLIES

A suitable connector system always consists of an ideal combination of three key components: connectors, interconnection technology and a suitable cable. A connector can only meet the requirements of a customer's application when combined with the appropriate cable and a reliable connection.



## Standard or customized communication protocols

The exchange of information between various participants is based on communication protocols that define different framework conditions for data transfer. There are standardized network protocols such as TCP/IP and data transfer protocols

such as HDMI® (High-Definition Multimedia Interface) or USB® (Universal Serial Bus).



ODU HIGH SPEED DATA TECHNOLOGY



[Video](#)

Presentation of ODU  
cable assembly



[Download](#)

Standard cables and  
accessories catalog

Many manufacturers also have specifically developed protocols for their own specific applications. Among other things, the various protocols differ in terms of the number of communication participants, the data stream path, or the hierarchy of the communication partners.

A tested system solution – where the professional and process-safe design of the cable assembly is tested for its transmission properties and signal integrity on the basis of the respective protocol – is therefore the right choice, especially in the field of data technology.

A qualified cable assembly for standard protocols typically includes an ODU connector at one end and a standard interface connector (DisplayPort®, Ethernet/IP®, SPE, HDMI® or USB®) at the other end of the cable, including the appropriate test protocols. Other premium connectors can also be easily integrated.

ODU's many years of experience enable it to provide customers with the best possible support and to implement customer-specific protocols.

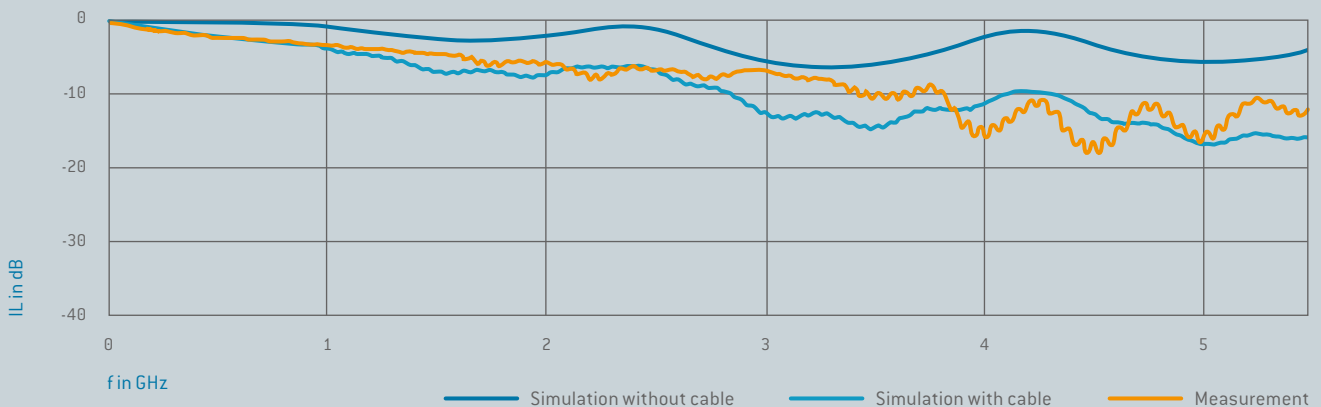
## In-house simulations speed up processing – even for customer-specific projects

ODU uses its extensive simulation know-how even before the first samples are built. As a result, only a few initial samples are required for validation by the customer, since computer-aided calculations can be tested before the physical sample is built.

The simulation results are already very close to reality (see diagram below), making one optimization loop usually sufficient.

## Insertion loss (IL)

Comparison of insertion loss (IL) from simulation (with and without cable) with real measurement result on initial sample:



Customers benefit from the following advantages thanks to the portfolio variants defined by ODU:

- No qualification costs, as cable assemblies are already fully tested and qualified.
- Using simulation results, the final product can be developed without samples.
- ODU provides simulation results so customers can plan and verify the overall system in advance.
- Short-term changes can be implemented quickly and cost-effectively.
- Within the channel limits, the cable assemblies can be ordered individually in their total length.
- Standard assemblies are available from batch size 1 and with short delivery times thanks to factory stocking of individual components.

The result is short delivery times and low development costs.



[Find out more](#)

All information about cable assembly can be found here.

# ODU FIBER OPTIC FOR HIGH DATA RATES

As digitalization progresses, so do the requirements for high-performance and interference-free data networks. ODU Fiber Optic technologies make it possible to combine maximum data transmission and minimum latency with a range of future-oriented functions.

The ODU portfolio currently includes the following fiber optic contact technologies:

### EXPANDED BEAM PERFORMANCE

Insertion loss	≤ 0.7 dB (SM) ≤ 0.3 dB (MM)
Mating cycles	25,000
Cleaning	Every 5,000 mating cycles
Fiber types	Multimode 50 / 125 μm Single mode 9 / 125 μm

### EXPANDED BEAM

Insertion loss	≤ 1.5 dB
Mating cycles	100,000
Cleaning	Every 20,000 mating cycles
Fiber types	Multimode 50 / 125 μm

### PHYSICAL CONTACT

Insertion loss	≤ 0.5 dB
Mating cycles	1,000
Cleaning	Before each plugging process
Fiber types	Multimode 50 / 125 μm Single mode 9 / 125 μm

### POLYMER OPTICAL FIBER (POF)

Insertion loss	≤ 1.5 dB
Mating cycles	10,000
Cleaning	Not necessary
Fiber types	980 / 1,000 μm



Video

Presentation of ODU  
Expanded Beam Performance



Download

ODU Fiber Optic  
Catalog



Communication system  
that can be equipped with  
ODU AMC® Series T  
Expanded Beam  
Performance.



In principle, the fiber optic cables that are typically used for Ethernet to transmit at speeds of up to 10 Gbps can be used over much longer distances, while copper cables (twisted pair cables) are limited to 100 meters, according to the industry standard. Thus, 10 Gbps can be transmitted up to 550 m over a multimode fiber and even up to 40 km over a single-mode fiber.

For various connector series, ODU has developed fiber optic and hybrid connector solutions that combine fiber optic technology with power contacts and different connection cross sections for transmission media.

Due to the high requirements for connecting fiber optic cables to the connector, the portfolio includes fully assembled fiber optic system solutions. Combined use (with other media) in the vicinity of magnetic fields can also be a decisive advantage, for example in magnetic resonance imaging (MRI).

The strong customer interest in Expanded Beam Performance solutions, such as the communication system shown above, is not unfounded, as it represents the fiber optic solution of the future. It offers high-end transmission characteristics over many mating cycles, and the excellent optical performance remains unchanged even under mechanical stress, environmental influences and harsh ambient conditions.

Because there is no direct contact between the contact ends, Expanded Beam connectors are insensitive to contamination and can be easily cleaned. Under normal conditions, cleaning every 5,000 mating cycles is sufficient. This ensures reliable, damage-free transmission.



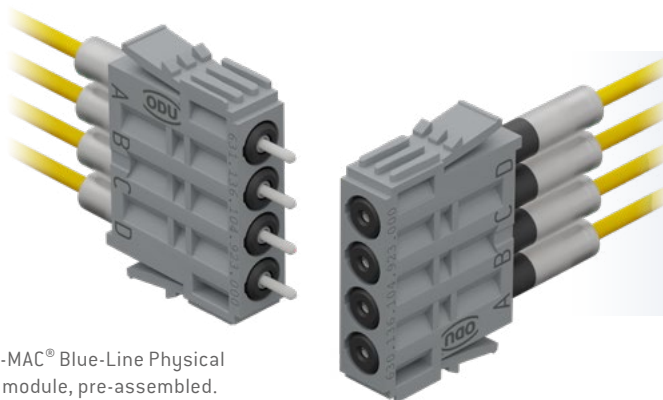
[Find out more](#)

Discover ODU  
fiber optic technology.

# MODULARITY INCLUDING FIBER OPTIC

A modular connector can combine different types of transmission in a hybrid interface. A special feature is the possibility of combining different fiber optic modules so that high data rates can be transmitted quickly and without interference in one connector together with other media.

The ODU-MAC® connector portfolio offers modular solutions depending on the application:



The ODU-MAC® Blue-Line Physical Contact module, pre-assembled.

Space requirement	3 units
Insertion loss	≤ 0.5 dB
Fiber types	Multimode 50/125 μm Single mode 9/125 μm
Mating cycles	1,000

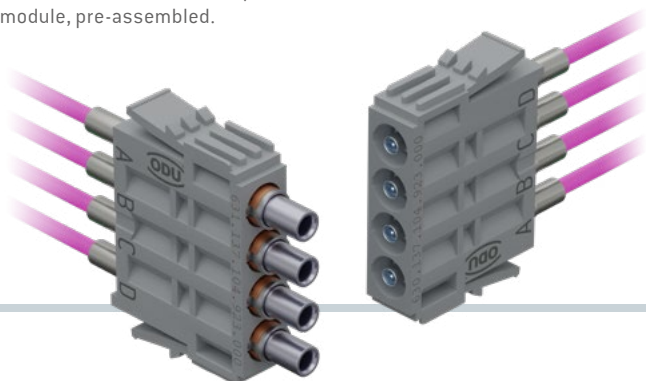
## High-density and modularity:

Space requirement	3 units
Insertion loss	≤ 1.5 dB
Fiber type	Multimode 50/125 μm
Mating cycles	100,000*



A modular connector with various fiber optic inserts.

The ODU-MAC® Blue-Line Expanded Beam module, pre-assembled.



## Available soon!

The ODU Fiber Optic portfolio is constantly being extended so that Expanded Beam Performance modules will also be available for the ODU-MAC® Blue-Line in the near future.



[Find out more](#)

Learn more about modular connectors

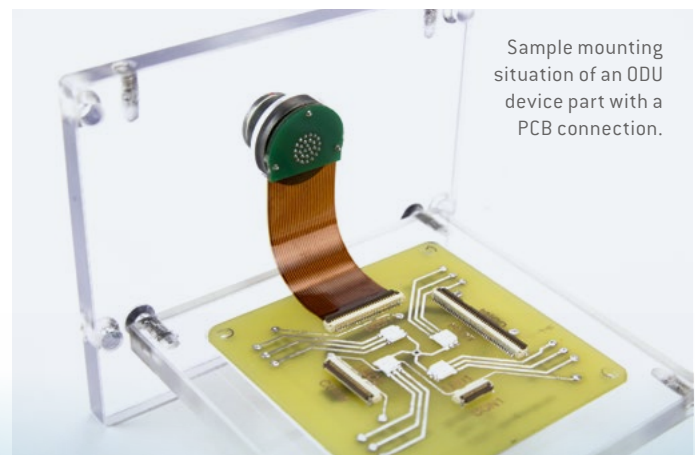
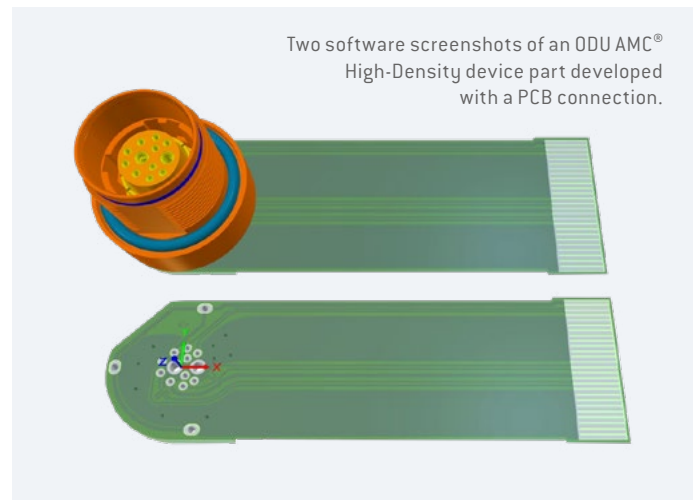
\*Contact transition specifications may vary.

# HIGH-DENSITY INSIDE

With an increasing number of contacts and a higher packing density, PCB connection technologies are the obvious choice. Various device parts with PCB connections can already be offered as pre-assembled solutions.

Long-standing partners near our main plant in Mühldorf a. Inn are familiar with the various connection technologies. We develop the appropriate layout, or adopt the customer's layout, and deliver a "plug-and-play" solution from a single source.

Whether on a rigid PCB, a flexible conductor or a rigid-flex combined product: ODU has the right solution to bring the typically high speeds of data technology neatly into the "heart" of the devices – with pre-assembled ZIF connectors that we're happy to create, or other brands of the customer's choice.



Think outside the box, about  
what's happening inside the box!

# ODU AMC<sup>®</sup> SERIES T MOBILE COMMAND POSTS

Rugged, fast and scalable solutions



The challenges to global security are subject to fundamentally changing conditions. Military systems must therefore be adaptable across the board. Applications with integrated C4ISTAR systems such as aircrafts, satellites, ships and ground vehicles collect immense amounts of data. Processing, analyzing and transmitting this data is a growing challenge.



In order to make the collected data immediately available, synchronization, bundling and distribution can take place in specially equipped vehicles as well as in container systems that can be quickly relocated. Mobile command posts or even FOBs (Forward Operation Bases) require scalable connector solutions that ensure data, signal and power transmission – the

ideal application area for the ODU AMC® Series T with Expanded Beam Performance, which offers excellent transmission characteristics. It combines the advantages of our classic Expanded Beam solution, such as resistance to dirt, scratches and impact, with high-performance attenuation values of < 0.7 dB (single mode) or < 0.3 dB (multimode).



Shell size 9  
Ø 18.4 mm



Shell size 12  
Ø 24.9 mm

ODU AMC® Series T –  
Comparison between  
shell size 9 and  
shell size 12.

Compared to conventional expanded beam lens technology, 3 – 4 times the number of optical fibers can be integrated in the same space. As a result, the interfaces and space requirements are reduced and the transmission capacity over longer distances is significantly increased, while maintaining the same attenuation budget. The assembled system solutions are offered with the common standard interface connectors, such as LC, SC and MPO.

The ODU AMC® Series T offers numerous advantages due to the innovative locking mechanism with separately sealed components. The user can select different locking variants depending on the connected subsystem. The reliability and flexibility of the connector systems used, along with weight savings, robustness and ease of handling, can be just as important for survival as the secure transmission of high data volumes in extreme cases.

# RELIABLE HIGH-SPEED PRODUCTS

## FOR THE NETWORKED SOLDIER

ODU AMC® High-Density metal connectors are designed for the most advanced and modern applications. The wide range of applications for this reliable and rugged connector extends from advanced radios to helmet-mounted cameras and displays, computers/PAN, headsets and rear-mounted battery packs. In addition, the ODU AMC® High-Density is used in wrist-mounted displays, in global satellite navigation (GPS) and body diagnostic systems, as well as in night vision and thermal imaging devices.

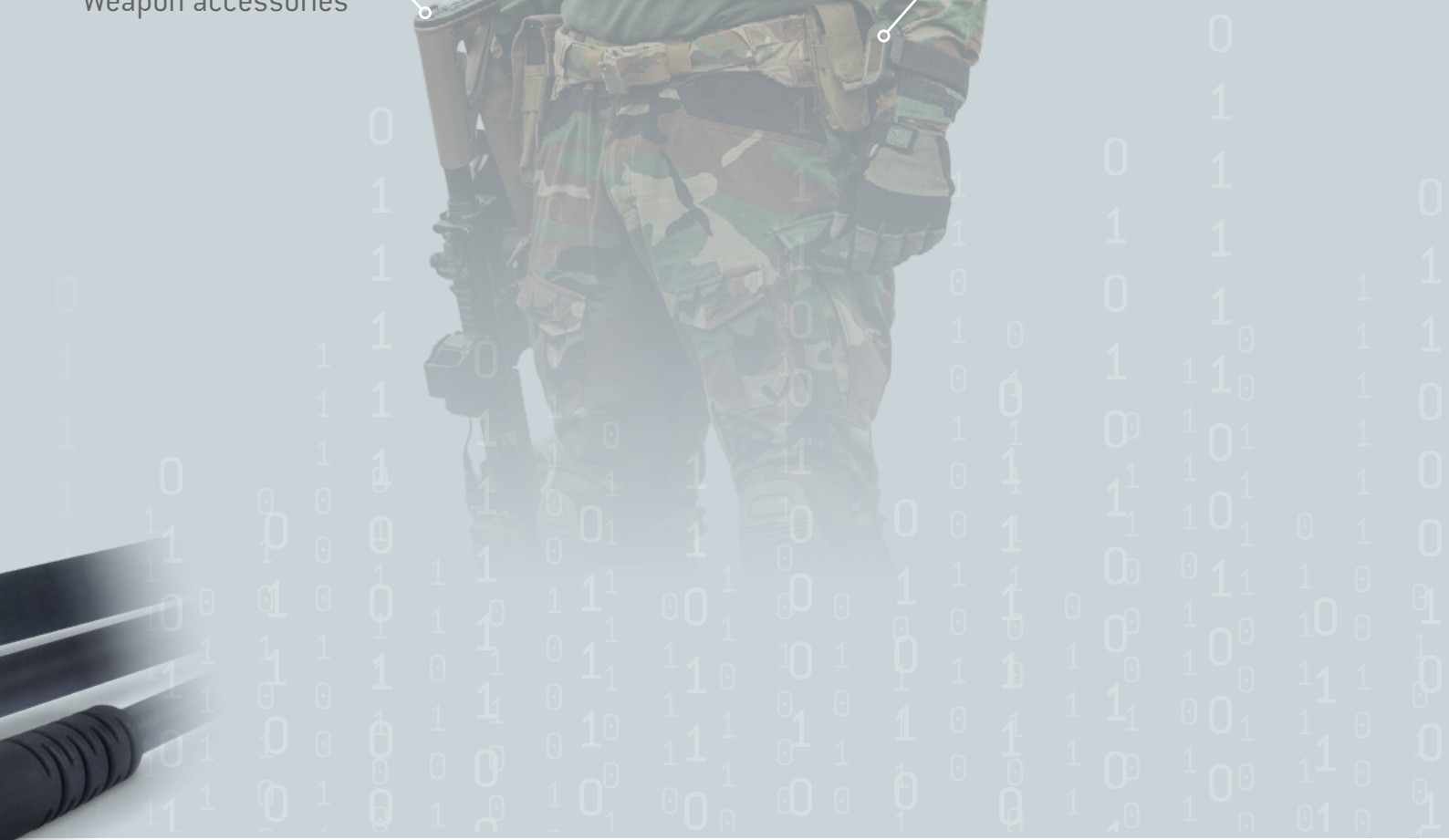
For push-to-talk and tablet accessories, the ODU AMC® High-Density combines a rugged miniature design with high-speed data transfer capabilities. Thanks to innovative software solutions and advanced technology, messages received on an MPU5 radio can be translated into more than 100 languages with the transmission fully encrypted – ODU's AMC® High-Density cable assembly provides the connection to the push-to-talk function.

As ODU continues to push the limits of data transmission possibilities in a compact design, the ODU AMC® High-Density product portfolio will continue to be the best and most reliable connection for the networked soldier.

Product portfolio of the ODU AMC® High-Density.



Various application areas for the ODU AMC® High-Density connector.



## ODU-MAC® Blue-Line

# POWER CONNECTOR

Where is the common ground for testing high-voltage storage, battery cells, inverters, charging stations, and electric drivetrains? Interfaces that can carry both high-current and high-voltage are needed. As e-mobility grows, so does the need for suitable test equipment and connectors.

### The solution is already on its way

Behind the scenes at ODU, work on the solution is in full swing. A high-current connector with a highly flexible silicone cable will be part of the ODU-MAC® Blue-Line before the end of 2023. High-current solutions up to 50 mm<sup>2</sup> are already available. The new high-current connector with touch protection increases the transfer to 95 mm<sup>2</sup>. A busbar connection is also available. Should this be insufficient, the option of a modular docking interface exists.

In addition to power transmission, a modular connector can also be combined with signals, coax, compressed air and fluid, data rates, thermal contacts and fiber optics. Our experts will work with you to find a flexible complete solution.



ODU-MAC® Blue-Line Power Connector – a connector to meet future needs for high-current and high-voltage transmission.



# ODU MEDI-SNAP<sup>®</sup> in size 3.5

Flexible in use, easy to handle



Regardless of whether a product is required for power transmission in combination with data rates (via copper or fiber optic lines) as well as fluids or coax, the ODU MEDI-SNAP<sup>®</sup> plastic connector in size 3.5 offers completely customized options thanks to its modular design – which makes this size unique on the market.

It can also be used in a wide range of applications: In medical technology, for example, it is suitable for endoscopy or arthroscopy, dental applications, defibrillators, robotics and cosmetic applications. The highest level of Means of Patient Protection and Operator Protection (2 MOPP/2 MOOP) according to IEC 60601-1 is always guaranteed. Optionally, a fully sterilizable cable assembly including silicone overmolding ensures a pleasant, adhesive-free feel without a stick-slip effect, maximum flexural strength and maximum process reliability in production.

Potential industrial applications include test equipment, automotive test systems and uninterruptible power supplies.

The space-saving product design of the ODU MEDI-SNAP<sup>®</sup> enables maximum versatility in the smallest of spaces thanks to its compact size, high contact density and low weight. It is characterized by the following specifications:

- + Maximum performance in minimum spaces
  - Space for up to 41 signal contacts
  - Signals, power and media such as fluids and air combined in one interface
- + User-friendly and reliable
  - Push-pull locking mechanism for easy connections
  - Highest patient and operator protection according to IEC60601-1: 2 MOPP and 2 MOOP
- + High flexibility
  - Variety of media inserts and pin layouts thanks to modular design
  - Various designs available
- + Minimal weight due to plastic housing

A single contact configuration as well as a flexible complete system consisting of a push-pull connector, a cable with appropriate assembly, including overmolding, and laser marking are implemented according to customer requirements.



Video

ODU Experts on Air:  
ODU MEDI-SNAP<sup>®</sup> 3.5

## FSIS & ODU

# AEROSPACE – Running tests while working from home

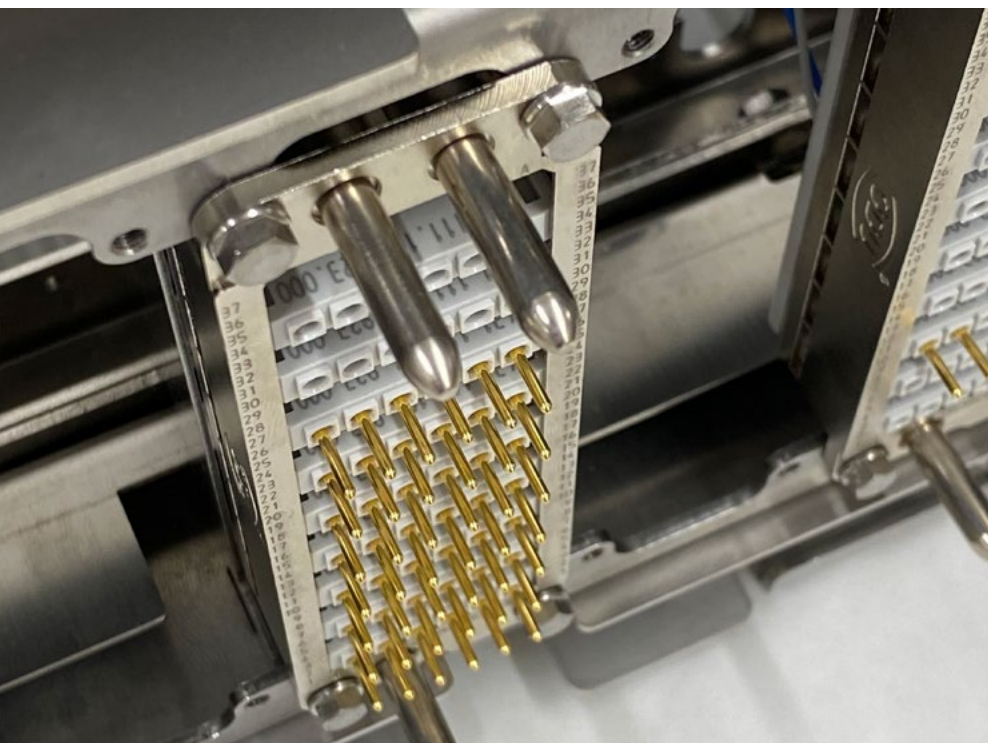
Large manufacturers in the aerospace industry require measurement systems with electromechanical assemblies. But where do the components for this come from? F. Schelkle Industrie-Service GmbH (FSIS), a mechanical engineering company, is active in this field and offers the integration of measurement technology in its portfolio. Years of experience and know-how enable FSIS to develop reliable solutions. The ODU-MAC® Black-Line Mass Interconnect System also plays a role in this.



MAGNUS MAYER,  
FSIS OPERATIONS MANAGER

**THE CONNECTOR** What is the mass interconnect solution used for?

**MAGNUS MAYER** In aviation, control units are subjected to rigorous testing during the development phase. The mass interconnect system facilitates the functional testing of the ECU by providing a simple connection between the test system and the prototypes. Different adapters can be automatically connected to the test system as needed.



The system is individually equipped as required.



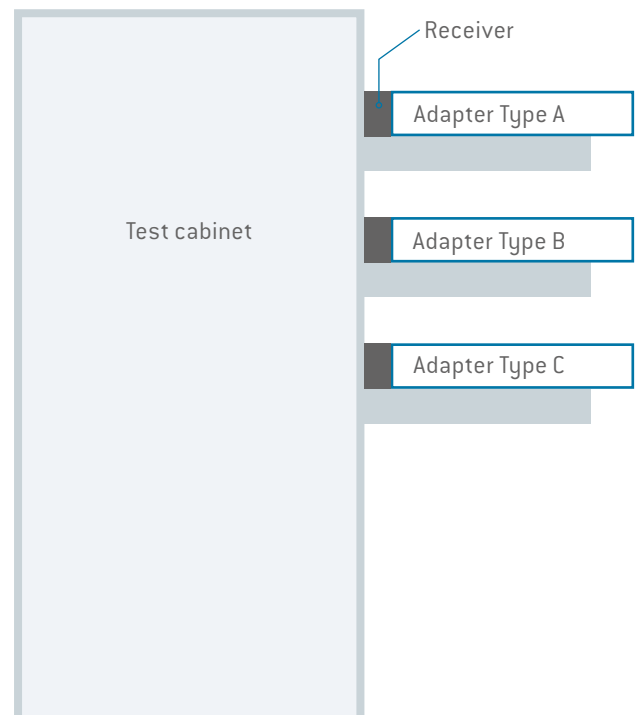
ODU's Mass Interconnect System helps to test aerospace products.

**THE CONNECTOR** What challenges did the ODU interface have to overcome?

**MAGNUS MAYER** The modular design and easily modifiable interface were key. This allows the system to be individually adapted to the test situation. Remote operation was also an important criterion for our customer, so that employees could operate the system from their home offices. The electromechanical connection and automation options of the ODU-MAC® Black-Line are just as important as the adapter recognition. The integration of ODU products into an existing system environment is very simple and flexible. Of course, the quick availability of ODU components was also a plus.

**THE CONNECTOR** How do you think the testing of products for the automotive and aerospace industries will develop in the future?

**MAGNUS MAYER** The transmission of high data rates and, of course, high-voltage and high-current, are already crucial. And the importance of automation is growing all the time. With ODU, we've found a partner who can meet these challenges and with whom we can work together on the solutions of the future.



The end customer's requirement was for only one adapter to be connected to the test system at a time and for the docking process to be automatic via remote control. The project was completed to the customer's complete satisfaction thanks to the electromechanical locking mechanism.



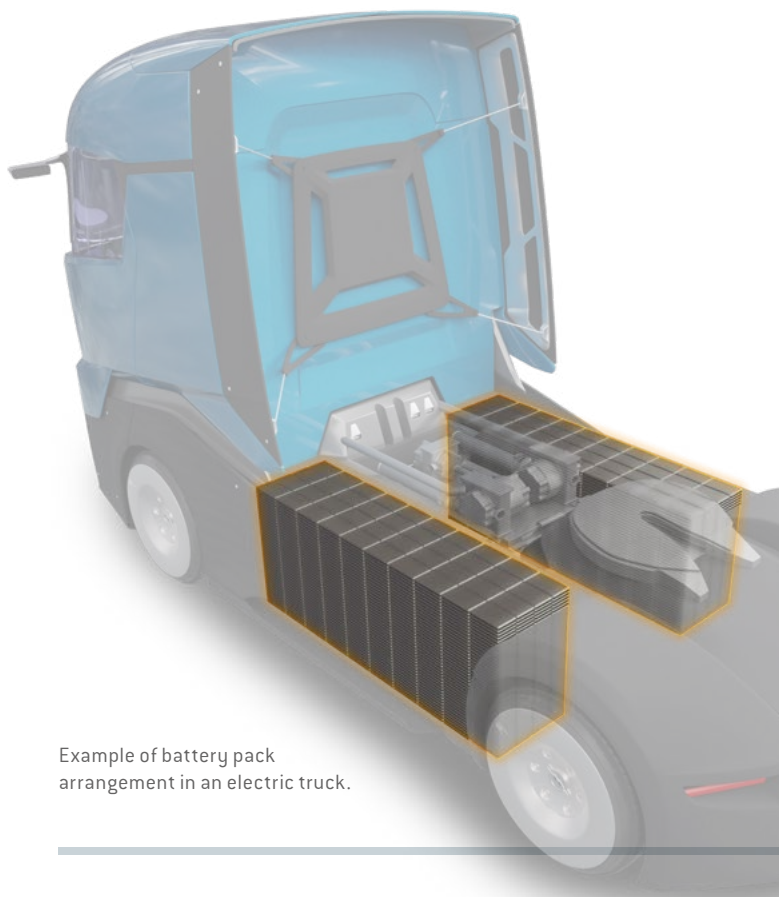
[Find out more](#)

All information about the ODU-MAC® Black-Line can be found here.

ODU DOCKING MATE<sup>®</sup>  
PAVES THE WAY!

# THE FUTURE WILL BE ELECTRIFYING

As decarbonization progresses, its effects are felt in all areas of mobility, including transportation. New vehicle architectures require a fundamental rethinking of electrical connector technology.



Example of battery pack arrangement in an electric truck.

For example, the arrangement of battery packs for fully electric transport vehicles varies to meet specific needs. Due to their modular design, each battery pack has a separate battery management system (BMS) that must be integrated into the overall electrical system.

## Battery Management System

The BMS performs numerous functions for a battery pack:

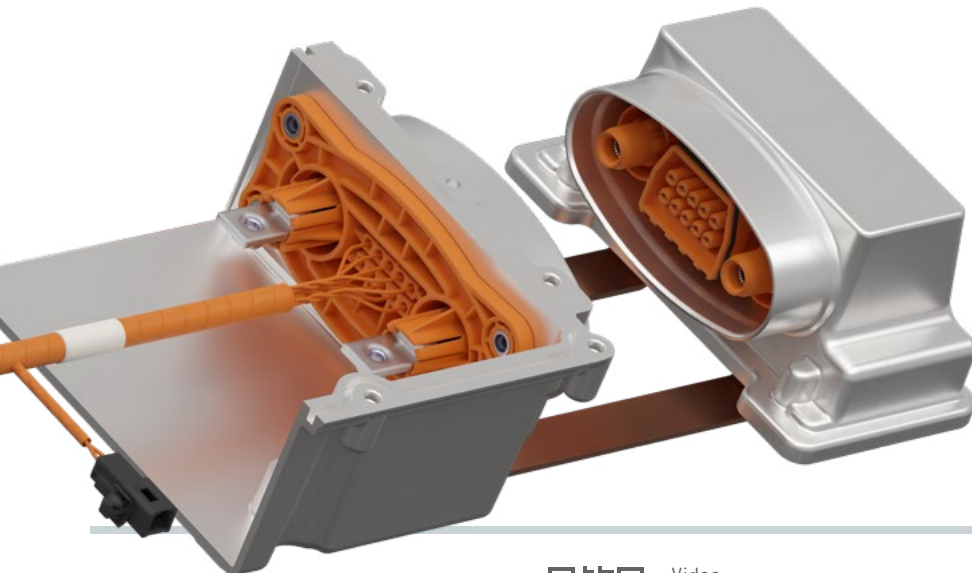
- Monitoring voltage, current, state of charge (SoC), state of health (SoH) and temperature.
- Balancing voltage and SoC between the individual battery cells.
- Protection against over-voltage, under-voltage and over-current.
- Control of efficient charging and discharging processes.



For some interfaces in an electric vehicle, wired standard connectors (see right) may be a viable option.

However, when combined with the design challenges around modularization, miniaturization and automation, as well as the massive increase in power requirements, a direct docking system (see below) is the more sensible and much more compact solution.

Wired plug-in connection between different components of an electric vehicle.



Due to the flexible application possibilities of the ODU DOCKING MATE® direct plug-in system, the interface between the battery and the BMS is also the ideal location for the direct plug-in system. This can reliably transmit power and signals, precisely compensate for tolerances and be plugged in blind.

The ODU DOCKING MATE® as a pluggable connection between the battery and the battery management system (BMS).



[Video](#)

Watch video  
ODU DOCKING MATE®



[Download](#)

ODU Automotive  
brochure

AVL DiTEST &amp; ODU

# SAFE INTERFACES for battery testing

Repair shops and vehicle manufacturers require a wide range of technological solutions for measurement and vehicle diagnostics – especially when it comes to electric or hybrid vehicles. AVL DiTEST is a manufacturer of innovative test equipment and specializes in automotive applications. With the multifunctional HV SAT Tool, high-voltage batteries can be extensively tested with a single device. This includes end-of-life testing, the status of stored batteries, and safety testing prior to further processing or disposal. The Austrian company, headquartered in Graz, uses both modular and circular connectors from ODU. The AVL DiTEST HV SAT uses the ODU-MAC® Blue-Line with high-voltage modules as an interface.



The modular connector as a complete solution including cable assembly on the measuring device.

**THE CONNECTOR** What requirements did you have for the connector and what convinced you that the ODU-MAC® Blue-Line connector was the right choice?

**DAVID PFLANZL** The HV SAT system is made up of a main unit and a suitable test adapter, both of which are connected to the ODU-MAC® Blue-Line connector. Since the test adapter has a different connection to the battery depending on the vehicle manufacturer, it's important to select and connect the appropriate test adapter. Due to this high variance and the stress in the workshop environment, the connection must be safe, robust and reliable and allow for a high number of mating cycles.

**THE CONNECTOR** How does the HV SAT battery tester you developed work? What is the role of the ODU-MAC® Blue-Line connector?



DAVID PFLANZL,  
PRODUCT MANAGER FOR E-MOBILITY AT AVL DiTEST



[Download](#)

Brochure ODU-MAC® Blue-Line –  
a universal solution



Compact case with test adapter for electric and hybrid vehicles.

## What AVL DiTEST & ODU do together

- End-of-service testing after battery repair
- Full safety testing after battery storage and transportation
- Safety testing before further processing or disposal
- Residual bus simulation for battery activation
- Verification of zero voltage and dielectric strength
- Leak testing of the battery housing
- Measurement of insulation resistance

**DAVID PFLANZL** The demands on the connector at AVL DiTEST are very high, as a large number of tests are carried out to guarantee the safety of a battery. To determine the success of a repair, a combination of several measurements and tests on the high-voltage system are required, along with a pneumatic connection for leakage control with overpressure and underpressure measurement, and a data connection to the battery control unit including power supply for controlling and activating the battery.

**THE CONNECTOR** What are the advantages of working with ODU?

**DAVID PFLANZL** There is a **single** contact for the entire system of connectors, assembly and testing. We have a long-standing partnership with ODU and truly appreciate cooperating should-to-shoulder to find solutions together.



# The new ODU Product Finder – access to PRODUCT INFORMATION at any time

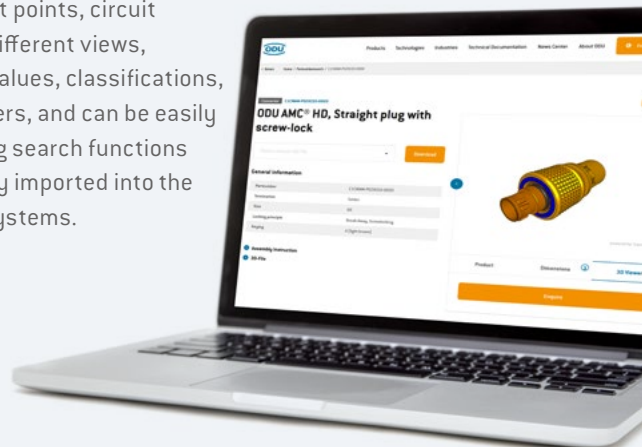
The database has been expanded to include a wide range of products, including components for modular connectors. In addition, matching items such as mating connectors, accessories and assembly tools are offered.

## Online libraries

Selected circular connectors with fast availability can be found on [Traceparts.com](https://www.traceparts.com) and are available through an extensive partner network on websites such as [octopart.com](https://www.octopart.com) and [3dcontentcentral.de](https://www.3dcontentcentral.de). [Traceparts.com](https://www.traceparts.com) also enables the download of 3D data in over 70 different formats to match your CAD software.

Selected modular connectors (ODU-MAC® Blue-Line) are available for download in multi-CAD/CAE formats in various libraries such as EPLAN, Zuken and Cadenas [3dfindit.com](https://www.3dfindit.com).

The data is enriched with intelligent information such as attachment points, circuit symbols, different views, technical values, classifications, part numbers, and can be easily found using search functions and directly imported into the CAD/CAE systems.



# FAST AVAILABILITY

## of assembled connectors

ODU is known for its extensive portfolio of high-quality contacts as well as for its connectors.



The cable assembly connects ODU connectors with the matching cables.

For example, in applications where high-currents or temperatures are involved, high data rates are transmitted via copper or fiber optic cables, and sealing is important, it is not enough to simply offer a high-quality connector without considering the connection technology or cable assembly, too.

By collaborating with cable manufacturers and distributors, ODU is able to offer its customers qualified cable assemblies even in small quantities. Contrary to the general market trend, ODU can also ensure fast availability thanks to its stocking of catalog items. The cable assemblies are available in any length, so that customers are not limited to pre-defined dimensions.

Catalog cable assemblies are available with a choice of silicone overmoldings or standard bend reliefs. For the connection of the

connector to the cable, ODU can also create customer-specific overmoldings – with different colors, logos, arrows or similar indentations. Possibilities range from thermoplastic overmolding to silicone overmolding for increased strain relief and kink protection.

The tools developed and manufactured at ODU for straight or angled versions are designed for samples, small series or large series production (depending on the application).

Cable assembly is also now gradually becoming an integral part of the ODU product search. This means that customers can order the ready-assembled solution as soon as they select the right connectors – in combination with ODU Express-compatible connectors, these cable assemblies are available within a very short timeframe.



ODU silicone overmoldings combine hygiene and durability and are suitable for use in everyday medical applications.



# ODU WORLDWIDE

## Global manufacturing capabilities for ODU cable assemblies

What all ODU cable assemblies have in common is their quality, which, without exception, is outstanding!

Since cable assemblies can be manufactured in any ODU plant, local manufacturing capabilities are available around the globe.

The European plants are located in Romania and Germany. **The plant in Sibiu, Romania**, is also well prepared with the production of numerous connectors and its capacity is currently being significantly increased.

**At the headquarters in Mühldorf a. Inn**, there is also a separate prototyping area for project start-ups in terms of manufacturing.

**In Asia**, the Shanghai plant is well equipped and serves our global customers – even beyond the borders of China and Asia.

**In North America**, ODU has rapid prototyping facilities in the US and in the northwesternmost part of Mexico. In Tijuana, for example, ODU has a fast production line for project start-ups in the immediate vicinity of San Diego, California, the American logistics center.

In addition to ODU's own plants, there are other local partner companies through which our ODU sales companies can offer the cable assemblies.

All of this results in a variety of options with regard to region, production speed and volume orientation – and therefore cost, too.



Partner Futami from Tokyo.



The "Sample Lab" in Camarillo (USA).



Expansion of the ODU plant in Sibiu.



ODU mass production in China.



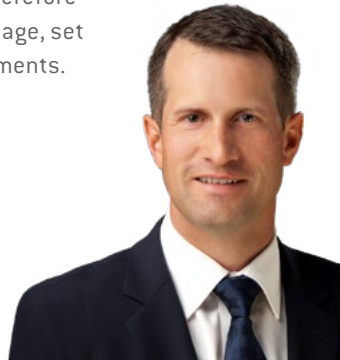


## New Business Development Manager Military at

# ODU IN EUROPE AND THE US

**Alexander Burger**, born in Passau, lives in Austria. He started as contact person and Business Development Manager Military Europe on January 1, 2023. After his high school education, he began his career as a military officer and graduated as an industrial engineer. Since 2009 he has held a variety of sales positions at multiple companies in the defense industry. Throughout those years, Alexander worked in application areas that today represent a large part of the application spectrum of ODU connectors. He is ideally integrated in the entire military-industry network and can therefore identify future projects at an early stage, set the right course and initiate developments.

Welcome, Alexander Burger.



**HOBBIES** Running, hiking and golfing

**PROFESSIONAL GOALS** To establish ODU as a key player in the European military connector market.

**PREFERRED VACATION DESTINATION** The Baltic Sea, on the island of Usedom.

**WHAT I APPRECIATE MOST ABOUT PEOPLE** Straightforwardness and open-mindedness

**STRENGTHS** Commitment and assertiveness

**WHAT I APPRECIATE ABOUT ODU** The openness, clarity and flexibility with which I was welcomed.

**FAVORITE QUOTE** "People never lie as much as before an election, during a war or after a hunt." – Otto von Bismarck

**Craig Kammerman** is the new Business Development Manager for ODU-USA's Military Business Unit, serving as the primary contact for military customers in North America.

Craig holds a B.S. in Mechanical Engineering from West Virginia University and has 10 years of experience in the electrical industry.

He's looking forward to joining the ODU team and representing ODU's extensive, high-quality product portfolio.

Welcome, Craig Kammerman.



**HOBBIES** Cooking and golf

**PROFESSIONAL GOALS** To support the team and contribute to ODU's vision for the future.

**PREFERRED VACATION DESTINATION** Traveling to new places is always a great thing.

**WHAT I APPRECIATE MOST ABOUT PEOPLE** Trustworthiness

**STRENGTHS** Detail-oriented and willing to roll up my sleeves to help the team tackle tasks.

**WHAT I APPRECIATE ABOUT ODU** Everyone is very accommodating and helpful.

**FAVORITE QUOTE** "The key is not the will to win... everybody has that. It is the will to prepare to win that makes a great player or a great team." – Bob Knight



## New Sales Managers at

# ODU IN AUSTRIA AND CHINA

**Andreas Mader** has been Regional Sales Manager of the newly founded ODU Austria GmbH since January 2023. He will gradually take over the customers and tasks of ODU sales partner Roland Wöhrleitner, who will retire at the end of Q1/2024.

After his apprenticeship in the field of mechatronics, Andreas studied economics with a focus on market communication and sales as well as strategic corporate management.

In his professional career, Mr. Mader looks back on 15 years of sales experience, including distribution with a focus on connectors and cable harnesses, and is very familiar with the Austrian market.

Welcome, Andreas Mader.



**HOBBIES** Mountain biking and 3D printing

**PROFESSIONAL GOALS** To be the first point of contact for customers and to establish and develop long-term customer relationships.

**PREFERRED VACATION DESTINATION** Croatia

**WHAT I APPRECIATE MOST ABOUT PEOPLE** Reliability and helpfulness

**STRENGTHS** Curious and highly self-motivated

**WHAT I APPRECIATE ABOUT ODU** A great team that takes pride in its work and wants to move forward together.

**FAVORITE QUOTE** "It's never too late for a happy childhood."  
– Erich Kästner

**Herbert Xu** has been Sales Manager for ODU China since the end of 2022. In his role, he is responsible for all sales and marketing strategies and ensures the development and growth of the local business.

He studied electronics and telecommunications engineering at Hohai University in China and received his MBA from Carleton University in Canada. Mr. Xu has in-depth knowledge and extensive industry expertise from a career spanning more than 19 years as a product manager, marketing manager and sales manager in various industries.

Welcome, Herbert Xu.



**HOBBIES** Travel, swimming and reading

**PROFESSIONAL GOALS** To develop business growth with the sales and marketing team.

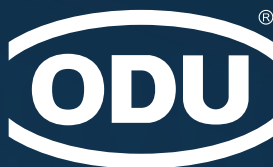
**PREFERRED VACATION DESTINATION** Wherever I can be with my family.

**WHAT I APPRECIATE MOST ABOUT PEOPLE** Integrity, transparency and openness

**STRENGTHS** Openness and adaptability, strategic thinking and a customer focus

**WHAT I APPRECIATE ABOUT ODU** Great company that focuses on the customer and people, and is also professional and developing.

**FAVORITE QUOTE** "Living without an aim is like sailing without a compass." – John Ruskin



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[www.odu-connectors.com/contact](http://www.odu-connectors.com/contact)

## PRODUCTION AND LOGISTICS SITES

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

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The contact arrangement of an ODU data transmission connector differs from a standard data transmission connector due to the robust ODU specific design. However, the ODU design meets the electrical specifications of the respective standard data transmission protocol.

All dimensions are in mm.  
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