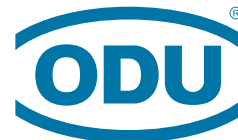


A PERFECT ALLIANCE.



ODU MINI-SNAP[®] HYBRID CONNECTORS

Maximum performance and reliability to fit the smallest available spaces – a solution made to measure!

MULTIFUNCTIONAL
INTERFACE



HYBRID CONNECTORS

A PERFECT ALLIANCE.



A PERFECT ALLIANCE.

ODU GROUP OVERVIEW

- More than 75 years of experience in connector technology
- A turnover of 170 million Euro
- Over 1,900 employees worldwide
- 9 sales subsidiaries in China, Denmark, France, Germany, Italy, Japan, Sweden, the UK and the US as well as 5 production and logistics sites
- All technologies under one roof: Design and development, machine tool and special machine construction, injection, stamping, turning, surface technology, assembly and cable assembly

As of February 2018

CERTIFIED QUALITY

- DIN EN ISO 9001
- IATF 16949
- DIN EN ISO 14001
- ISO 13485
- Wide range of UL, CSA, VG and DVA licenses
- UL certified cable assembly

For a complete list of our certifications, please visit our website.

CUSTOMER-SPECIFIC SOLUTIONS

Contacts, connectors and integrated cable assembly solutions meeting the most demanding technical market requirements – ODU's connector solutions and value-added services are characterized by their exclusive focus on meeting the customer's needs.

- Precise implementation of application-specific requirements regarding design, functionality, cost and exclusivity
- Custom connector solutions derived from standard products
- One-to-one local expertise and fair, friendly consulting
- Quick prototyping and production turnaround



CREATING CONNECTIONS, BUILDING ALLIANCES, COLLABORATING INTO THE FUTURE



Dr.-Ing. Kurt Woelfl

Managing Director

Corporate Development, Engineering, Finance/Controlling, Human Resources, IT & Business Processes, Production, Quality Management, Research & Development, Supply Chain Management

Denis Giba

Managing Director

Corporate Communications/Marketing, Corporate Development, Portfolio Management, Sales

TECHNOLOGY THAT UNITES – CONNECTIONS THAT INSPIRE

For over 75 years, this commitment has enabled us to innovate and provide solutions that respond to continuously changing market needs. We provide high-quality electrical connectors that create added value for our customers and any market player seeking a reliable connector solution to enable the transmission of power, signals, media and data transmission.

A PERFECT ALLIANCE is our guiding principle. It represents the synergy between our high-quality connector solutions and the strong partnerships we build with our staff and business partners across the globe – partnerships based on trust, reliability and mutual respect.

ODU is one of the world's leading suppliers of connector systems today, employing over 1,900 people worldwide and generating approximately €170 million in sales. To ensure the very highest quality standards in our cutting-edge products, we continuously invest in their development and production – and ultimately, in our very unique expertise. Over the past few years, our development of customer- and application-specific connectors has led to the sustained growth of our standard product range so that today, we cover a broad range of application areas. A balance between project-specific business, including customized developments, and standard connector design will continue to shape our business into the future. This holds true

for emerging and future markets, such as medical, military and security, and energy, as well as for the special requirements of measurement and testing, eMobility and industrial electronics.

A PERFECT ALLIANCE – The future of ODU will continue to find solid ground for growth: in our focus on providing reliable connector solutions for a variety of challenging applications and in our commitment to continuously expanding our technology portfolio. It's what we do and who we are – around the globe. This brochure is an invitation for you to become even better acquainted with ODU, an internationally active technology company devoted to creating high-quality customized connector solutions.

We are actively shaping the future of our company with creativity, imagination and innovation in order to serve our valued customers around the world.

ODU – A PERFECT ALLIANCE.

The Managing Directors:

Dr.-Ing. Kurt Woelfl and **Denis Giba**



HYBRID CONNECTORS – VERSATILE AND EASY TO USE

Smaller, lighter, more powerful – what applies for end devices in the areas of industry, medical technology, as well as test and measurement is also a key requirement for the connecting interfaces and transmission infrastructure.

The trends that will drive future developments in the connector technology are:

- Miniaturization
- Ease of installation
- Optimized use of space

Hybrid connectors meet all of these objectives mentioned above and furthermore also the demands of increasingly challenging environmental conditions due to:

- Quick installation Push-Pull locking
- Combined transmission of various media in one interface:
electrical (signals, power, data)
physical (liquids, gases)

Hybrid connectors offer tailored, application-specific solutions. They are suited for use in harsh environments while ensuring high numbers of mating cycles.

⊕ THE BENEFITS OF HYBRID CONNECTORS

- One interface for a wide variety of transmissions facilitates ease of installation
- Highest performance
Data transmission: up to 100 Mbit/s
Operating pressure: up to 5 bar
Power transmission: up to 8.5 kW
Signals: up to 22
- Proven Push-Pull locking – for up to 5,000 mating cycles
- Minimal space requirements – as little as 15 mm
- Maximum reliability even under the most challenging environmental conditions – from –40 °C to 120 °C
- And much more!

APPLICATION SCENARIOS

TEST AND MEASUREMENT

APPLICATION: mobile analytics and monitoring of gas flow

TASK: combined transmission of electrical signals and gases in one single interface

SOLUTION:

- Ease of handling due to combining two media transmission types in one interface featuring the quick to install ODU Push-Pull technology and the possibility for a direct mounting on the PCB via print soldering.
- Tailored design and material selection, withstanding the harsh environmental conditions in the field while taking into account specific assembly requirements.
- Maximum reliability ensured by customized test procedures (a.o. confirming requirements for higher impermeability, mating forces and mating cycles)



INDUSTRIAL AND OUTDOOR

APPLICATION: GPS-Monitoring and control of fertilizer distribution within mobile agricultural equipment.

TASK: combined transmission of electrical signals and data in one single interface

SOLUTION:

- Ease of handling due to combining data and signal transmission in one interface featuring the quick to install ODU Push-Pull technology and the possibility for a direct mounting on the PCB via print soldering
- Quick data transmission thanks to data transfer rates of up to 100 Mbit/s according to Fast Ethernet standard¹
- Outstanding operational reliability in the most challenging environmental conditions characterized by strong vibration, dust and water (IP 68) as well as electromagnetic interferences within the connector



MEDICAL TECHNOLOGY

APPLICATION: controlling, power and air supply of professional dental cleaning equipment

TASK: combined transmission of air, electrical signals and power of up to 8.5 kW (at 1.25 kV AC) in one single interface

SOLUTION:

- Ease of handling with one interface combining several media transmission types featuring the quick to install ODU Push-Pull technology
- Maximum process security due to the employment of crimp termination of contacts
- Minimal weight thanks to plastic housing
- Highest efficiency in regards to installation and operation is enabled by the use of application-specific materials such as stainless steel in the air feed-through area and a connector design precisely tailored to the customer's assembly specifications (separate connection of air tube, single conductor and strain relief)



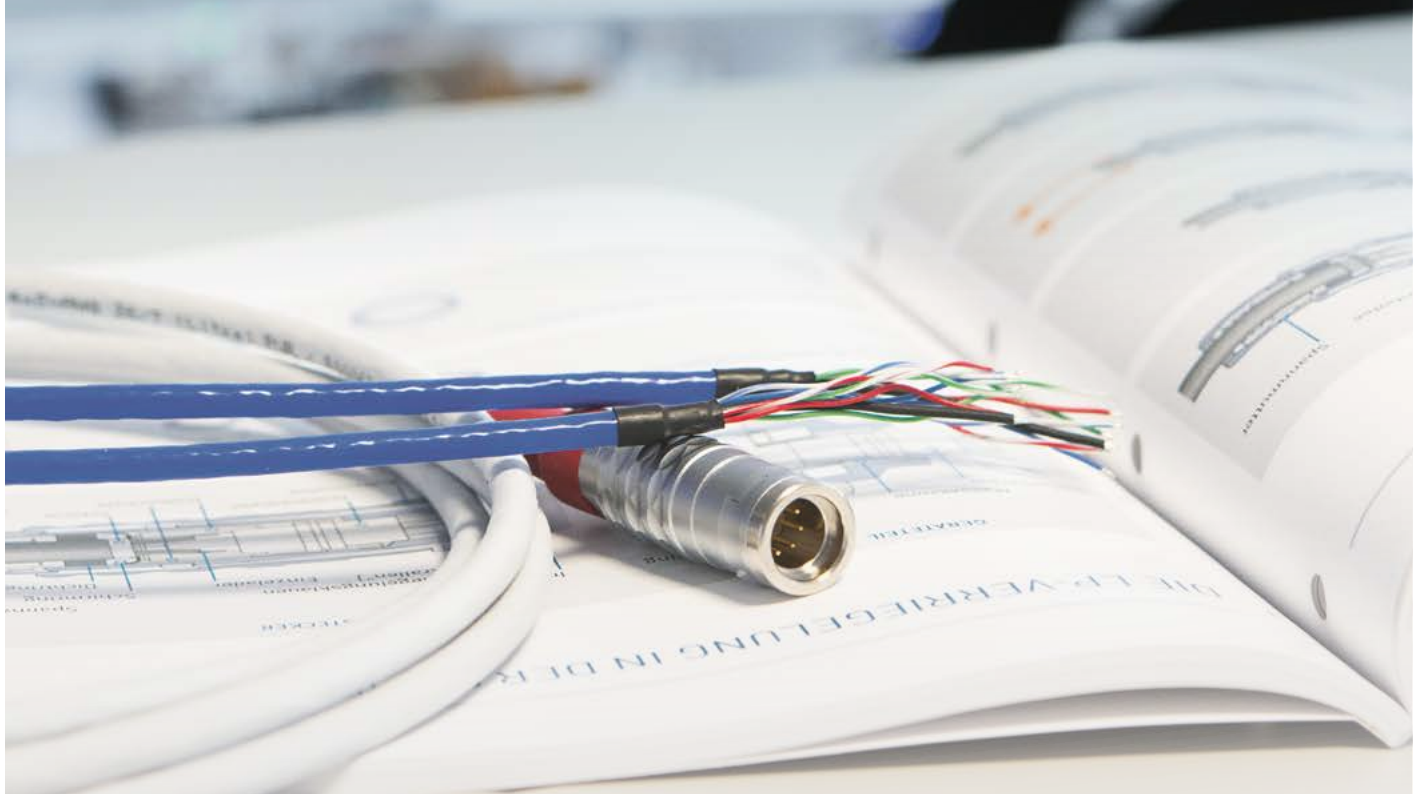
¹These ODU specific connectors can transmit common data transmission protocols such as Ethernet, but they are not Ethernet-standard connectors.

MORE THAN JUST ONE SOLUTION – STANDARD OR TAILOR MADE

While ODU offers an extensive range of existing hybrid connectors, we're also fully aware of the wide variety of challenges our customers face.

ODU stands for fast, dependable solutions and short paths. Keeping the products, specifications and final applications firmly in mind, our customer consultants are able to find the perfect connection you're looking for and deliver effective solutions tailored to your specific needs. ODU offers more than just products. Instead we provide a holistic service from the very first talks all the way to the finished application. We never lose sight of your required development and the challenges associated. We deliver customized infrastructure solutions including interfaces, connectors and cable assemblies of highest quality.

We'll be glad to provide you with support along your path to a connector solution that perfectly meets your needs. Call us today at +49 8631 6156-0 or send us an e-mail: info@odu.de



YOU'RE THE EXPERT WHEN IT COMES TO YOUR APPLICATION – WE'LL CREATE A TAILORED SOLUTION TO MEET YOUR NEEDS!

WHAT TYPES OF TRANSMISSION CAN YOU COMBINE IN A HYBRID CONNECTOR?

What makes ODU hybrid connectors so special is that both electrical and physical transmission types can be combined.

a) Electrical

Signal, power, data, special designs (e.g., coax)

b) Physical

Gases, liquids

WHAT ARE ESSENTIAL CONSIDERATIONS TO BE MADE PRIOR TO DETERMINING YOUR HYBRID INTERFACE?

a) General application characteristics

- Description of the application
- What types of transmissions are needed in my interface?
- How many transmission types do I want to combine?
- Available space
- Environmental conditions
(e.g., temperature, water, dust, chemicals)

b) Electrical characteristics

- Number of contacts
- Protocols
- Nominal voltage
- Nominal current

c) Physical characteristics

- Media type
- Tube diameter
- Nominal pressure

WHICH COMBINATIONS ARE MOST COMMONLY REQUESTED?

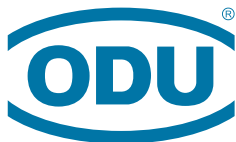
- | | |
|-------------------|------------------|
| • Power + signals | • Signals + coax |
| • Power + data | • Coax + liquid |
| • Signals + data | • Coax + gas |



WE'RE HERE FOR YOU.

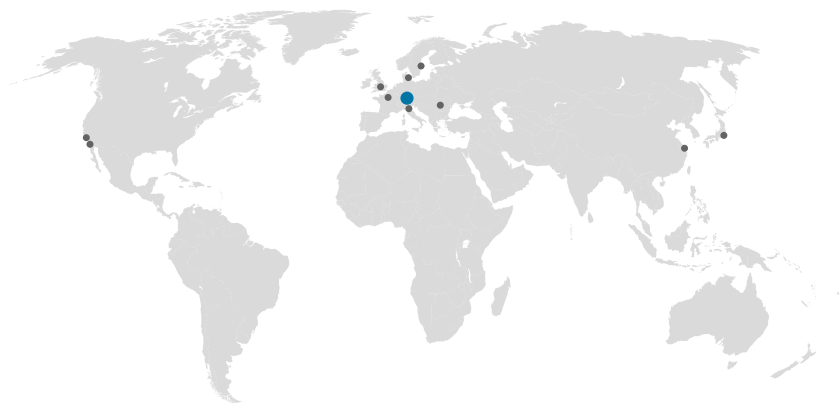
Whether you're looking for a standard or custom solution, we'll be happy to help. Call us today at +49 8631 6156-0 or send us an e-mail: info@odu.de





A PERFECT ALLIANCE.

ODU GROUP WORLDWIDE



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Further information and specialized representatives can be found at:

www.odu-connectors.com/contact

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Mexico ODU Mexico Manufacturing S.R.L. de C.V.

Romania ODU Romania Manufacturing S.R.L.

USA ODU-USA, Inc.

ODU North American Logistics



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