

ODU Connector Systems

A connection you can count on



Our philosophy



Competence and innovation

More than a thousand companies around the world produce connectors and offer hundreds of catalog products. Many also develop and manufacture customized solutions for their customers.

Then what qualifies ODU to be your partner for connectors?

Our magic words are: **flexibility**, **proximity to customers** and **employee motivation**. This is how we've established ourselves in the most demanding markets around the world.

We are contributing to our customers' success with our forward-looking new developments and reliable products.



ODU at a glance



Strong arguments:

- Sole-supplier to more than 100 companies around the world: Alcon, Ericsson, Hewlett-Packard, Philips, Nokia, Vorwerk, Siemens, Zeiss, etc.
- 30 development orders a year
- Continuous growth
- 650 employees in Mühldorf, Germany
- More than 200 employees in seven subsidiaries in France, Great Britain, Romania, Scandinavia and the USA; two subsidiaries in China
- Certified to ISO 9001 and ISO/TS 16949, also VDE, UL, SCA, VG and MIL certifications
- All technologies under one roof: design and development, tool manufacturing, injection molding, stamping, turning, electroplating, assembly automation and cable assembly

We work for the best – around the world!

SIEMENS

PHILIPS

LEONI

Endress+Hauser 
People for Process Automation

SMAG
Salgitter Maschinenbau

PEINER
Greifer

SCHILLER
The Art of Diagnostics

VORWERK

HBM

AW

alber



Experience has a future



1942 Founding in Berlin by Otto Dunkel

1947 New start in Mühldorf am Inn

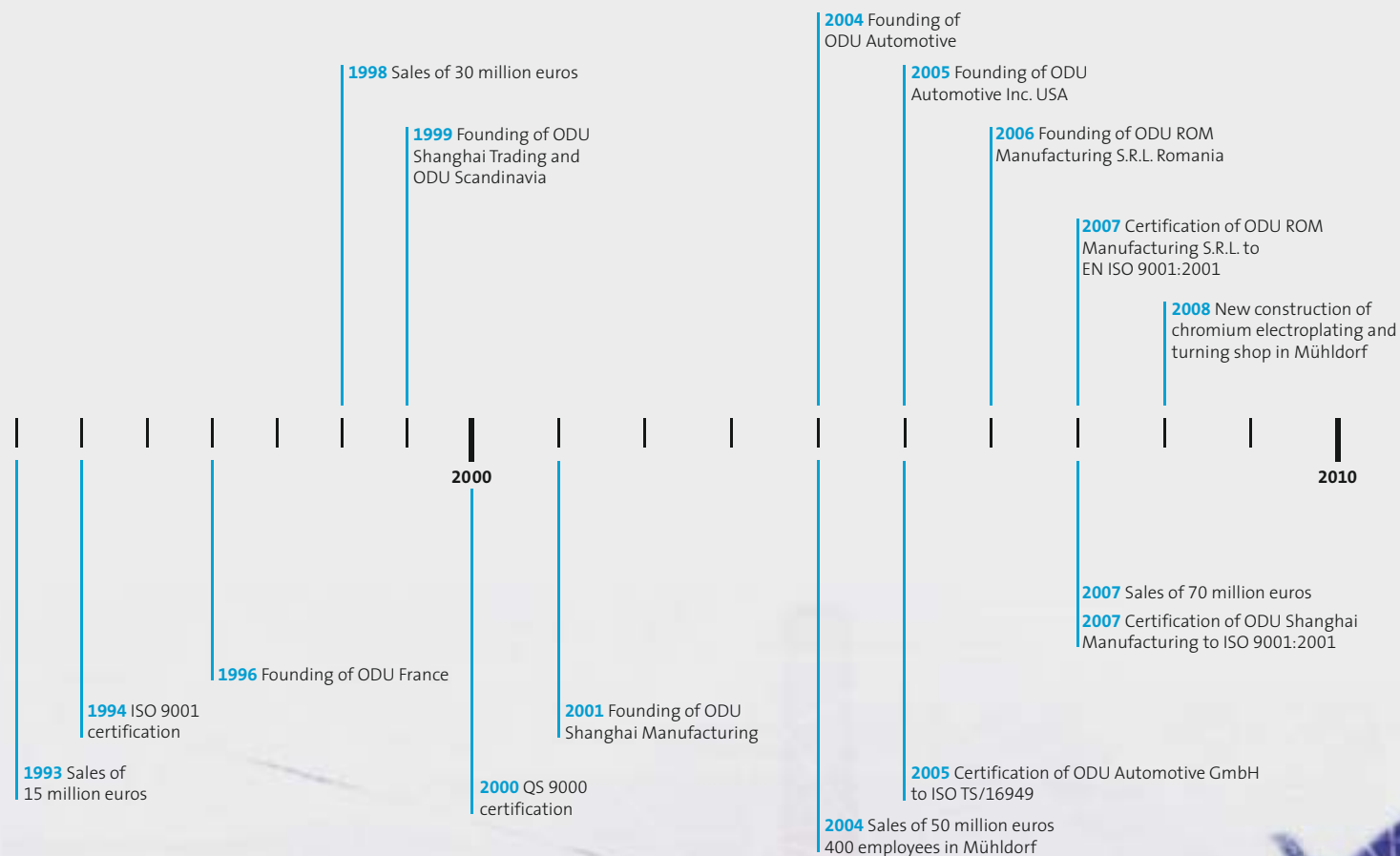
1971 Death of Otto Dunkel

1983 Sales of 10 million euros

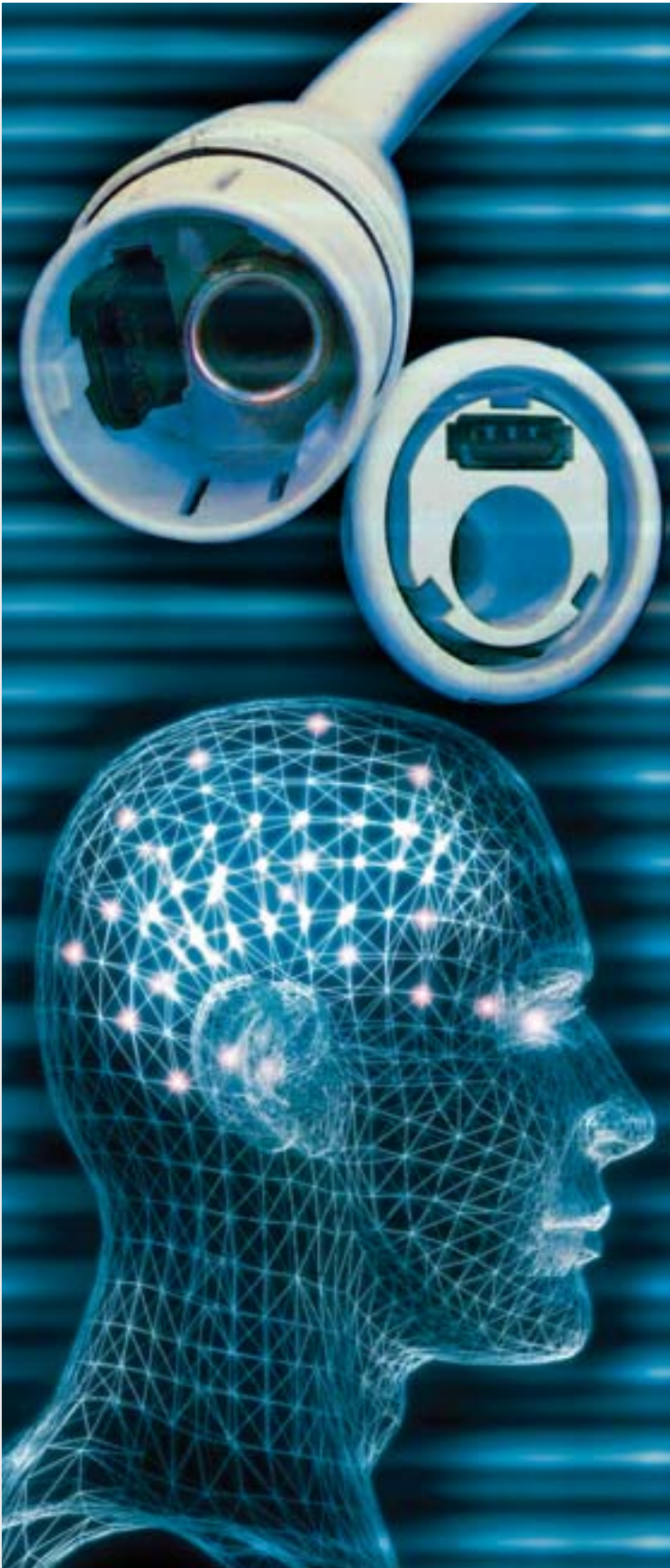
1985 Founding of ODU USA

1987 Founding of ODU UK





Our products for your success



ODU develops reliable solutions in the connector area for well-known companies. The result: high-quality, innovative products for the global market.

These connector systems offer clear benefits:

- Very large **number of mating cycles** for profitable demands
- Absolute **contact stability** for reliable action
- **Easy condition** for quick action
- **Unmistakable connector position** for reliable work
- Easy-to-see recognizability for **faultless handling**
- High **ampacity**

This program connects

Single contacts
– round or flat

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Cylindrical connectors with
push-pull locking

Page 12–19



Modular attachable
connectors

Page 20–25



PCB connectors

Page 26



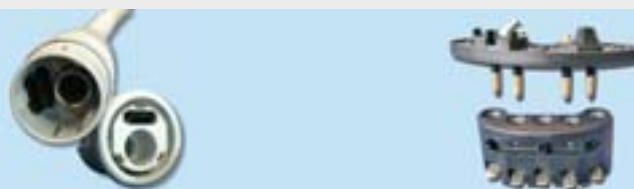
Robust cylindrical connectors

Page 27



Customized solutions

Page 28–29



Cable assembly

Page 30



ODU single contacts



1. ODU Springtac™ contact

The ODU Springtac™ contact is the ingenious invention of ODU's founder, Otto Dunkel:

- More than 100,000 mating cycles
- High ampacity up to 2,000 A
- Low contact resistances
- Large number of independently cushioning contact springs, for example, 40 at \varnothing 5 mm
- Low insertion and withdrawal forces
- Extremely secure contacting
- High vibration resistance
- Long service life due to high-grade materials and surfaces
- Many designs and connection types are available or feasible



2. ODU Flat Springtac™ Socket

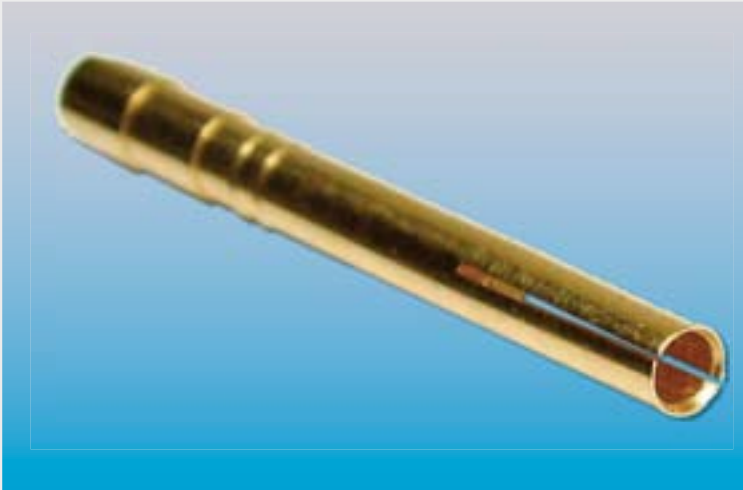
- For up to 100,000 mating cycles
- Low and particularly constant contact resistances
- Very reliable thanks to the Springtac™ system
- Solder and crimp termination
- Versions for 2-point and 4-point measurement
- Version for testing square pins
 $0.64 \times 0.64 \text{ mm}^2$
- Sockets are available for contact pins from
 $0.64 \times 0.64 \text{ mm}^2$ to $6.3 \times 0.8 \text{ mm}^2$
- Versions with quick-change head are available for an extremely high number of mating cycles (more than 1 million)



3. ODU Lamella contact

- More than 10,000 mating cycles
- High ampacity
- Low contact resistances
- Low insertion and withdrawal forces
- Secure contacting
- High vibration resistance
- Long service life due to high-grade materials and surfaces
- Many designs and connection types are available or feasible

The biggest among the smallest!



4. ODU slotted socket

- 5,000 mating cycles
- Smallest dimensions are possible
- High-grade materials and surfaces
- Many designs are feasible



5. Stamped contact technology

- 5,000 mating cycles
- High-grade materials and surfaces
- Standard contacts available for use in electronic components
- Economical alternative in large lot sizes
- Economic fabricating



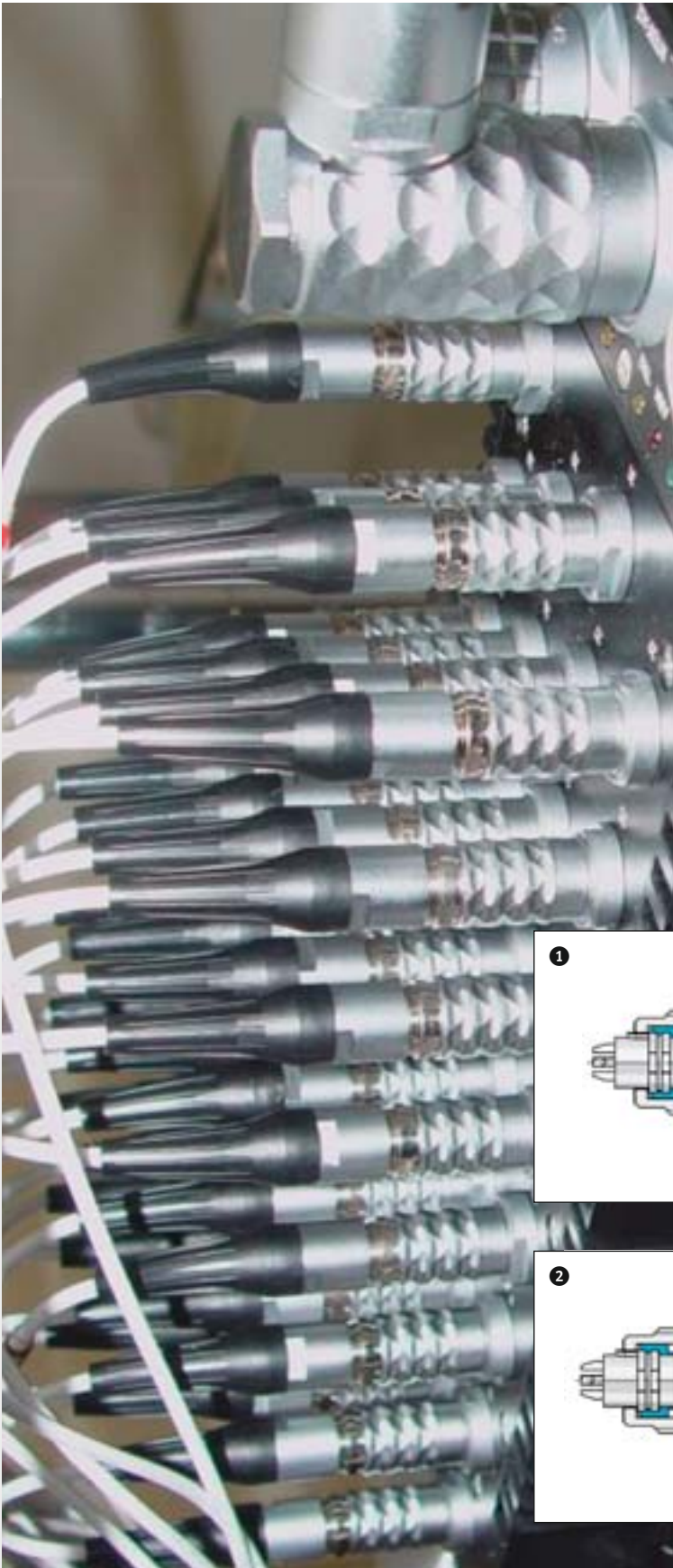
6. SPC – Single Pole Connector

The SPC combines the proven ODU lamella contacts with a robust housing.

- No unintentional unlocking thanks to the reliable push-pull locking principle
- Large number of mating cycles > 5,000
- Economic fabricating thanks to crimp termination
- Contact diameter 3 to 18 mm (up to a nominal current of 350 A)
- IP 50 or IP 67 possible when inserted
- Nominal voltage up to 1,000 Volt

You can find details about our single contact connector series on the Internet at:
www.odu.de/en/odu-products/single-contacts.html
 and in our technical product catalogs.

Cylindrical connectors with push-pull locking

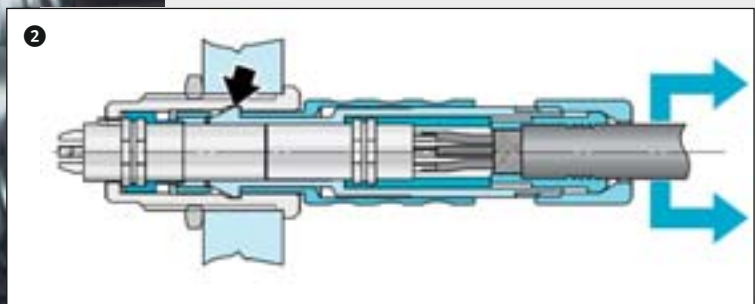
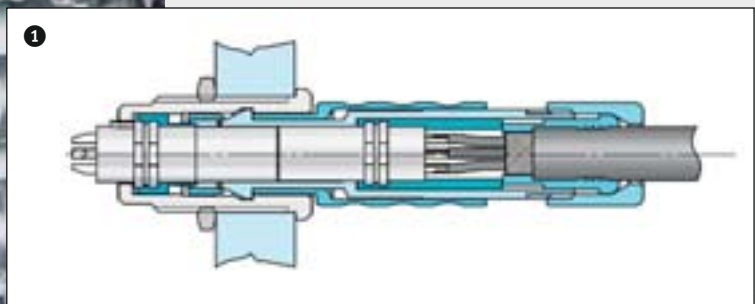


Advantages of a push-pull locking compared to a screw- or bayonet locking:

- **Quick and easy connection** and lock
- **Quick and easy separation**
- **Blind insertion and withdrawal** are easy, even in hard-to-access locations
- **Low space requirements** for devices
- Unambiguous, certain locking states
- **Low force required**
- **Suitable for robots**
- **Easy-to-clean** housing

How the push-pull principle works:

1. When pulled on the cable or at the clamping nut, the claw fasteners lock tightly into the locking groove of the receptacle. This makes it impossible to separate the connection.
2. If the user pulls on the outer sleeve, however, the claw fasteners emerge from the locking groove and so make it easy to separate the connection.



Always a good connection



ODU MINI-SNAP



ODU MINI-SNAP PC



ODU MEDI-SNAP

1. ODU MINI-SNAP – The right solution



Diversity on call

- Push-pull connector made out of metal
- 5 Series – L, K, B, S and F
- 8 sizes, 1 to 40 positions, mixed inserts
Outer diameter 6.5 mm to 42 mm
- More than 300 inserts in catalog versions
- UL, MIL and VDE certification
- Solder, crimp and PCB termination
- 5,000 mating cycles
- IP 50 and IP 68
- Customized adaptation is possible



Series L

- Coding with pin and groove
- LP locking principle with locking fingers
- Protection class: IP 50
- A multitude of coding options

Series K

- Coding with pin and groove
- LP locking principle with locking fingers
- Protection class: IP 68
- A multitude of coding options

Series B

- Coding with pin and groove
- FP locking principle using conical sleeve
- Protection class: IP 68
- Tight sealing with small outer diameter
- A multitude of coding options

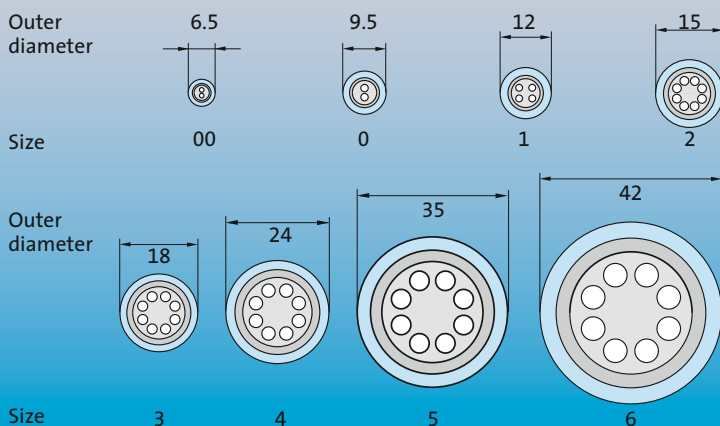
Series F

- Coding with half-shells
- FP locking principle using conical sleeve
- Protection class IP 50 and IP 68
- Blind mate
- A multitude of coding options

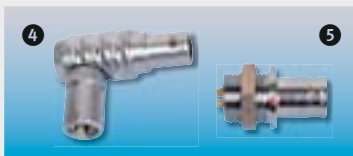
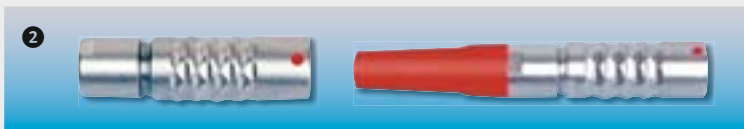
Series S

- Coding with insulation body
- LP and FP locking principles
- Protection class IP 50 and IP 68

Size of housings for the series:



Eight housing sizes are available in the five series: from 6.5 to 42 mm diameter



The ODU MINI-SNAP product program provides countless combination options:

1. Connector with/without cable bend relief
2. In-Line Receptacle with/without cable bend relief
3. Connector with lanyard for fast demating
4. Right-angle plug
5. Docking connector
6. Receptacle, IP 50 version
7. Receptacle, IP 68 version
8. Receptacle with right-angle contacts for front or rear installation

(Extract from the product program)



Special ODU MINI-SNAP models:

1. Black-chromium housing
2. Aluminum and stainless steel housing
3. Special/mixed inserts available, such as signal and media feedthrough in one connector
4. Shielded contact insert for Ethernet 100 Mbps
5. 100% sealed receptacle with glass seal

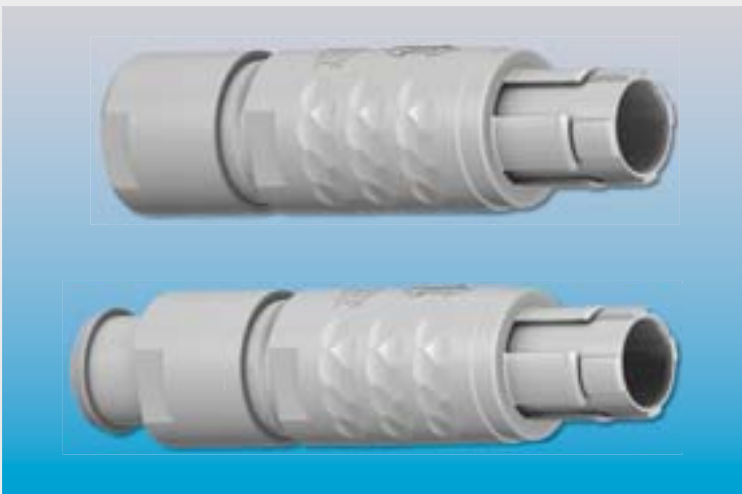


You can find details about our ODU MINI-SNAP connector series on the Internet at www.odu.de/en/odu-products/cylindrical-connectors/odu-mini-snap.html and in our technical product catalogs.

2. ODU MINI-SNAP PC – the light-weight alternative



- Push-pull connector made out of plastic
- 3 sizes, outer diameter 12.5 to 19 mm
- From 2 to 27 positions, mixed inserts
- Solder, crimp and PCB termination
- Colors: grey, black and medical white
- Housing 100% touch-proof
- IP 50 and IP 67 with and without EMC protection
- Low weight
- Low mating and demating forces
- 5,000 mating cycles
- UL certification
- Turned and stamped contacts
- Non-magnetic
- High chemical resistance
- Customized solution possible
- Easy assembly of the connector



ODU MINI-SNAP PC standard version:

Plug with and without cable bend relief



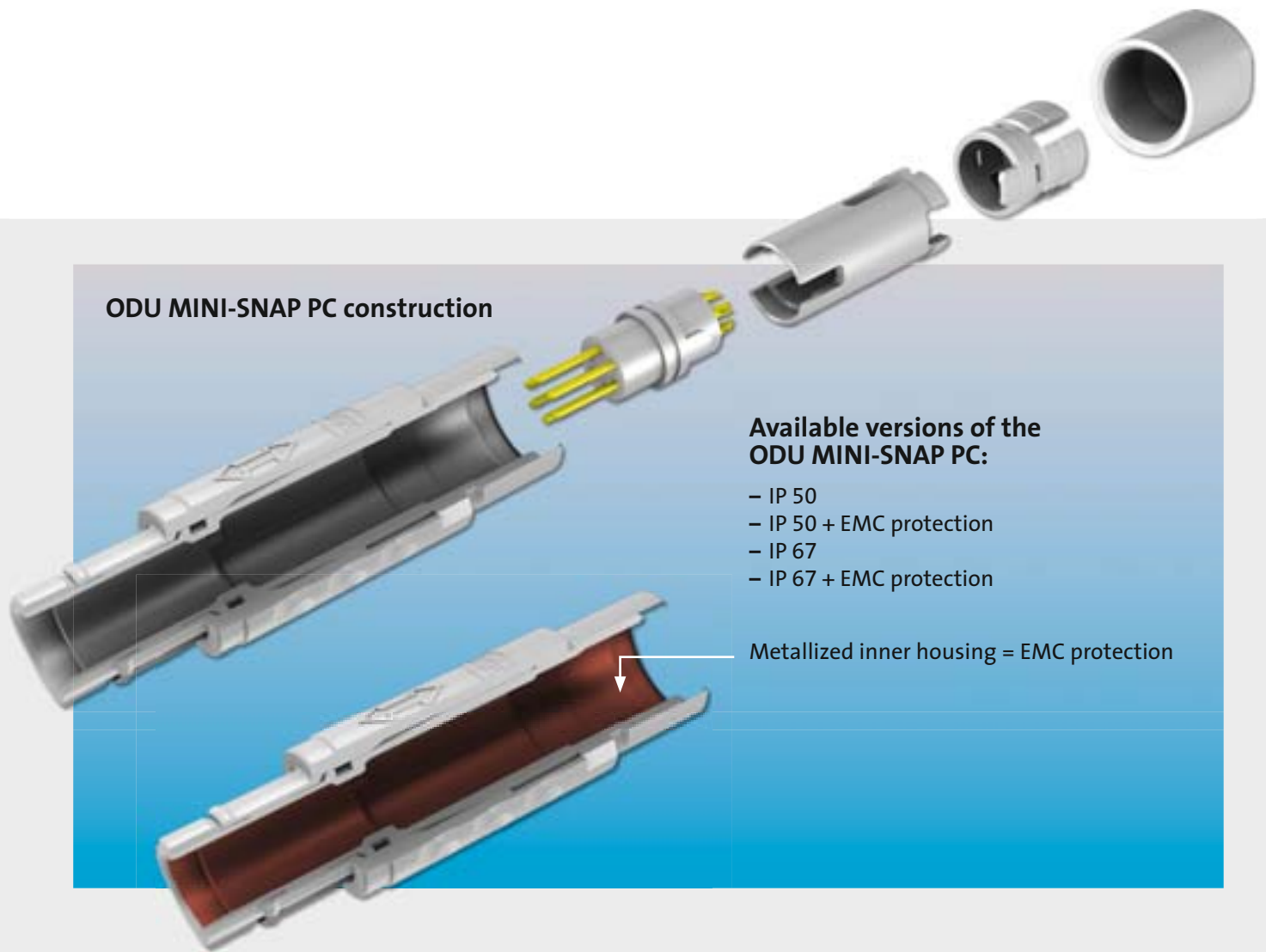
Receptacle

IP 50 (left picture) and
IP 68 (right picture)



In-line receptacle

with and without cable bend relief

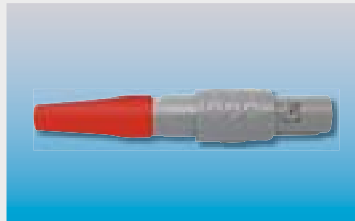


You can find details about our ODU MINI-SNAP PC connector series on the Internet at www.odu.de/en/odu-products/cylindrical-connectors/odu-mini-snap-pc.html and in our technical product catalogs.

3. ODU MEDI-SNAP – Safety at first sight

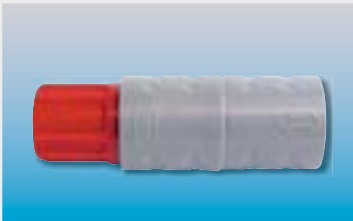


- Push-pull connector made out of plastic
- Disposable version available
- 7 color-codings possible
- From 2 to 14 positions
- Special inserts available, e.g. fluid, fiber optic
- Housing made of PSU and PEI: autoclaving/ steam sterilization/ETO
- Easy connector assembly
- More than 2,000 mating cycles
- Housing 100% touch-proof
- Low weight
- Low mating and demating forces
- High chemical resistance
- Protection class IP 50 and IP 67



ODU MEDI-SNAP standard versions

- Straight plug
- With/without cable bend relief



- In-line receptacle with/without cable bend relief (left picture)
- Disposable version, straight and right-angled overmolding possible (right picture)



- Receptacle for installation from rear or front of panel (Protection class IP 50 and IP 67)





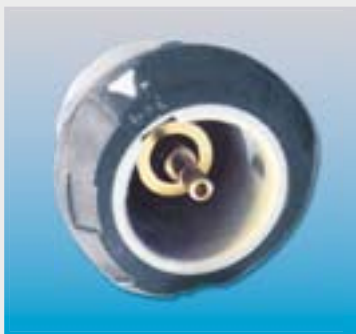
Right-angle plug

- Perpendicular cable outlet – the optimal solution when space is limited
- Compatible with all conventional receptacles



Metal housing

- Absolute plug and assembly compatibility with ODU MEDI-SNAP plastic series
- More than 1,000 mating cycles
- Robust housing model
- Flexible housing model (receptacles are available for installation from the front, rear and both sides of panel)
- Economical solution compared to the full-metal version



Fiber optic insert

- More than 1,000 mating cycles
- Suitable for fiber optic POF 980 / 1,000 µm
- Crimp termination



Fluid insert

- Working pressure: max. 2 bar
- Tube diameter (outer): up to 6.0 mm

You can find details about our ODU MEDI-SNAP connector series on the Internet at www.odu.de/en/odu-products/cylindrical-connectors/odu-medi-snap.html and in our technical product catalogs.

Rectangular connectors



What characterizes modular rectangular connectors from ODU?

High number of mating cycles, extreme contact reliability!

ODU Springtac™ contacts allow many 100,000's of mating cycles and, under favorable conditions, even many millions.

A high number of mating cycles is important not only in testing situations, but also in medical technology: for example, one patient every 20 minutes adds up to 100,000 mating cycles in 10 years.

Modularity

Because of the flexible assembly possibilities provided by the modules for transmitting power, signals, high frequency, light and compressed air, it is often possible to combine many separate connector functions in a single connector.

The modular all-purpose connectors



Easy operation

Easy operation is ensured by the spindle locking, particularly in the DIN housing.

Guiding features

The standard version in an aluminum frame has radial play of ± 0.6 mm. There are likewise versions available for higher offsets.



High connector density, reduced space requirements

E.g., 100 contacts (10 modules, each with 10 contacts) can be accommodated on an insulator length of 25 mm.



Vibration stability

The ODU Springtac™ contact has extreme contact stability (one of the successful tests: up to 1,200 g and 2,000 Hz at Whyte Laboratories).

Modification of the catalog model

If the demands are special, a customized (often even for a single piece) insulator can serve the purpose.



Non-magnetic contact

Non-magnetic contacts are available for special applications in medical technology (e.g., MRI) or also in military technology (e.g., mine-sweeping).

1. ODU MAC – uncompromising quality



- Modular rectangular connector
- Signal, power, high power, fiber optics, pneumatic, fluid and BUS modules are available for the ODU MAC system
- Extremely high number of mating cycles (> 100,000)
- Vibration protection
- Aluminum frame and DIN housing available
- Available in DIN housing with spindle locking and lever locking



ODU MAC in aluminum frame –
the docking solution:
Possible in lengths up to 182.5 mm



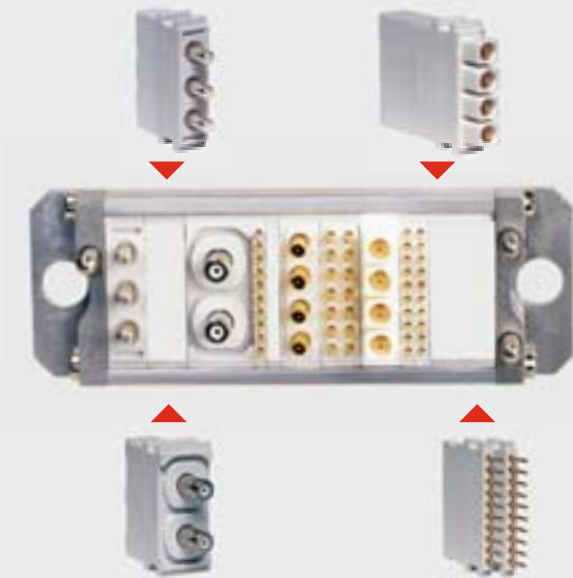
ODU MAC in DIN housing with spindle locking
for simple operation
Sizes II to IV



ODU MAC in DIN housing with lever locking
Sizes I to IV
Available with and without protective cover



ODU MAC in aluminum transverse frame
Two modules can be installed next to one another, up to a length of 10 units (each 2.54 mm)



Modules – you get what you want – individually put together

Signal, power, HF, fiber optic, bus and pneumatic modules are some of the modules that can be built into the ODU MAC



Space considerations often make it necessary to build a one-piece insulator.



You can find details about our ODU MAC connector series on the Internet at www.odu.de/en/odu-products/modular-attachable-connectors/odu-mac.html and in our technical product catalogs.

2. ODU MAC LC – the economical interface solution



Economic efficiency, flexibility, capability and robustness characterize this modular rectangular connectors. These product characteristics offer numerous advantages, such as:

- Simple packaging of the crimp contacts and modules, also independently of the frame
- Disassembly of the contacts from the insertion side
- No-tool locking in place and disassembly of the modules in zinc die-casting frame
- Ground termination with commercially available cable lugs and ground connection via guide system
- Up to 5,000 mating cycles
- Economical solution
- High density: up to 370 contacts in one housing
- Proven ODU contact technology (turned, slotted contacts)

The ODU MAC LC product series rounds out the ODU MAC product program with an economical and yet powerful connector.

You can find details about our ODU MAC LC connector series on the Internet at www.odu.de/en/odu-products/modular-attachable-connectors/odu-mac-lc.html and in our technical product catalogs.



Various housing models available with spindle and clamp locking



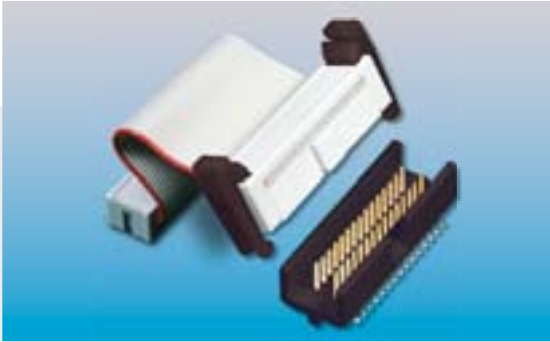
Various contact inserts for signals, power transmission and high frequency



4 frame sizes (12, 18, 26 and 37 units)

PCB connector

Contacts from board to board



ODU MINI-FLAKAFIX

- Board-to-cable connector
- Grid spacing 1.27 mm, 10 to 15 contact positions
- Headers and socket connectors strips for SMT and solder-in connection
- Straight and right-angle versions available
- With and without locking clamp (metal or plastic lever)



ODU FLAKAFIX

- Board-to-cable connector
- Grid spacing 2.54 mm, 10 to 64 contact positions
- Headers for solder-in, SMT, press-fit and pin-in-paste technology
- Socket connectors with single-U IDC (insulation displacement contact) with double and single action wiping spring contact
- Headers in straight, right-angle and low profile versions
- With and without locking levers



ODU MINI-CARD

- Board-to-board connector
- Grid spacing 1.27 mm
- Headers and socket connectors for solder-in and SMT connection
- 6 to 50 contact positions
- Stringable for PCB spacing from 7 mm to 17 mm



ODU CARD

- Board-to-board connector
- Grid spacing 2.54 mm
- Headers and socket connectors, straight and right-angle
- Headers and socket connectors for solder-in connection, 1 to 60 contact positions
- Standard and customized pin lengths
- 2 and 4 point contacts

You can find details about our PCB connectors on the Internet at www.odu.de/en/odu-products/pcb-connectors.html and in our technical product catalogs.

Robust connectors

For stringent requirements



Heavy-Duty connectors

Suitable for the most hostile environmental conditions:

- Up to 1,500 A
- Up to 252 contact positions
- More than 100 different pole images
- Screw- and bayonet locking
- ODU Springtac™ contacts for high contact stability
- Very long life time
- High packing density
- Mechanically robust

You can find details about our heavy-duty connector series on the Internet at www.odu.de/en/odu-products/robust-connectors/heavy-duty-connectors.html and in our technical product catalogs.



ODU DOCK

Connectors for robots, docking systems and tool changing systems:

- 4 sizes
- Connector diameters from 28 to 75 mm
- Interchangeable contacts
- ODU springwire contacts for high contact stability
- For extremely high number of mating cycles: version with quick-change head available
- Various inserts and pole images

You can find details about our Dock connector series on the Internet at www.odu.de/en/odu-products/robust-connectors/odu-dock.html and in our technical product catalogs.



ODU ROB

Cylindrical connectors suitable for use with robots; with plastic housing, without locking system:

- Version in IP 50 and IP 67
- Flammability class UL 94-V0
- Pilot contacts are possible
- Very good electric characteristics (operating voltage up to 800 V AC)
- Cable housing can be rotated in any direction, straight or right-angled cable outlet
- Simple packaging of the cable housing
- Cost savings with a system solution (connector and cable piece)

Customized solutions

Custom-tailored fits better



Are you looking for a connector that's not on the market yet?

No problem. Our motto is: "If it's not out there yet, we'll work with you to develop it!"

Engineering standards today can't keep up with production developments. The global demand for custom-tailored connectors is growing, in spite of all the standardization. And so there's more and more work for the "custom tailor". Because the emergence of completely new applications and requirements always calls for the ideal solution for the specific application, not an approximately suitable standard.

What benefits does this mean for our customers?

- Exact implementation of the specifications for the particular application when it comes to design, function, costs and exclusivity
- Protection in the accessory and spare part market
- Reduced costs for a large number of units
- Protection against imitation
- Use of special know-how

ODU carries out more than 30 development orders a year.

Examples of customized solutions



Push-pull connector with customized shielding for cardiac support systems:

- 100% protection against accidental contact and shielded
- Blind insertion
- DIN EN 60601-1



Modular rectangular connector for magnetic resonance imaging:

- Non-magnetic contacts
- 1 GHz
- > 50,000 mating cycles
- 64 coding possibilities



Interface connectors including cable connector for patient monitoring:

- Watertight IP 67
- > 30,000 mating cycles
- 24 contact positions
- Pull-off function



Special development for firearms with IR and laser light module (LLM):

- Serves as water-tight interface between weapon and laser
- Screw locking



Interface connector for massage unit:

- 3,000 mating cycles
- Air duct and signal contacts
- Hermaphrodite construction of the inserts
- Blind insertion



Connector for household appliance – connecting the mixing pot:

- 20,000 mating cycles
- Suitable for the dishwasher: up to 2,000 cycles
- Thermal stability: -30° to +160° C (-22° to +320° F)

You can find details about our customized connectors on the Internet at www.odu.de/en/odu-products/custom-specific-connectors.html and in our technical product catalogs.

Cable assembly by ODU

Everything from one source



Most connections also require a cable. Possibilities for connecting the flexes to the contacts include soldering and crimping.

The cable packager must therefore be knowledgeable in the areas of connectors, cables and packaging. These are requirements that ODU meets in full. From connector, cable and cable extrusion to water-tight potting (if required) – ODU manufactures the complete system without intermediary suppliers.

Packaging examples:



You can find details about our cable assembly on the Internet at www.odu.de/en/cable-assembly/connector-supplier.html and in our technical product catalogs.

ODU – the system supplier

Solutions tailored to the branch and customer



ODU stands for quality, flexibility and reliability. This is why customers from all market segments trust our products.

Medical technology



Telecommunication and mobile radio communication



Industrial electronics and automation engineering



Measurement and testing technology



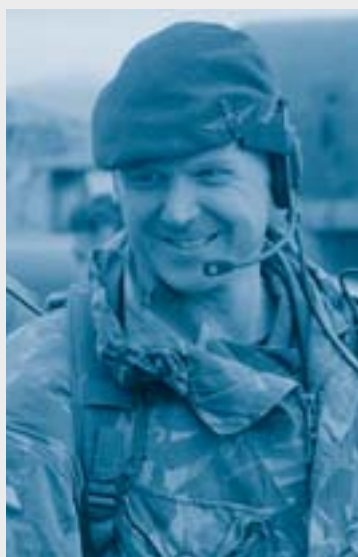
Machine construction and heavy industry



Other branches



Wherever high quality and powerful connection systems are needed, you can find customers who trust ODU connectors from Mühl Dorf.



Innovation and reliability in medical technology



As a technology of the future, medical technology is one of the largest growth industries. In the coming years, key technologies, such as imaging procedures, computer-supported communication techniques and minimally invasive procedures, will result in increased productivity and cost efficiency in the health field.

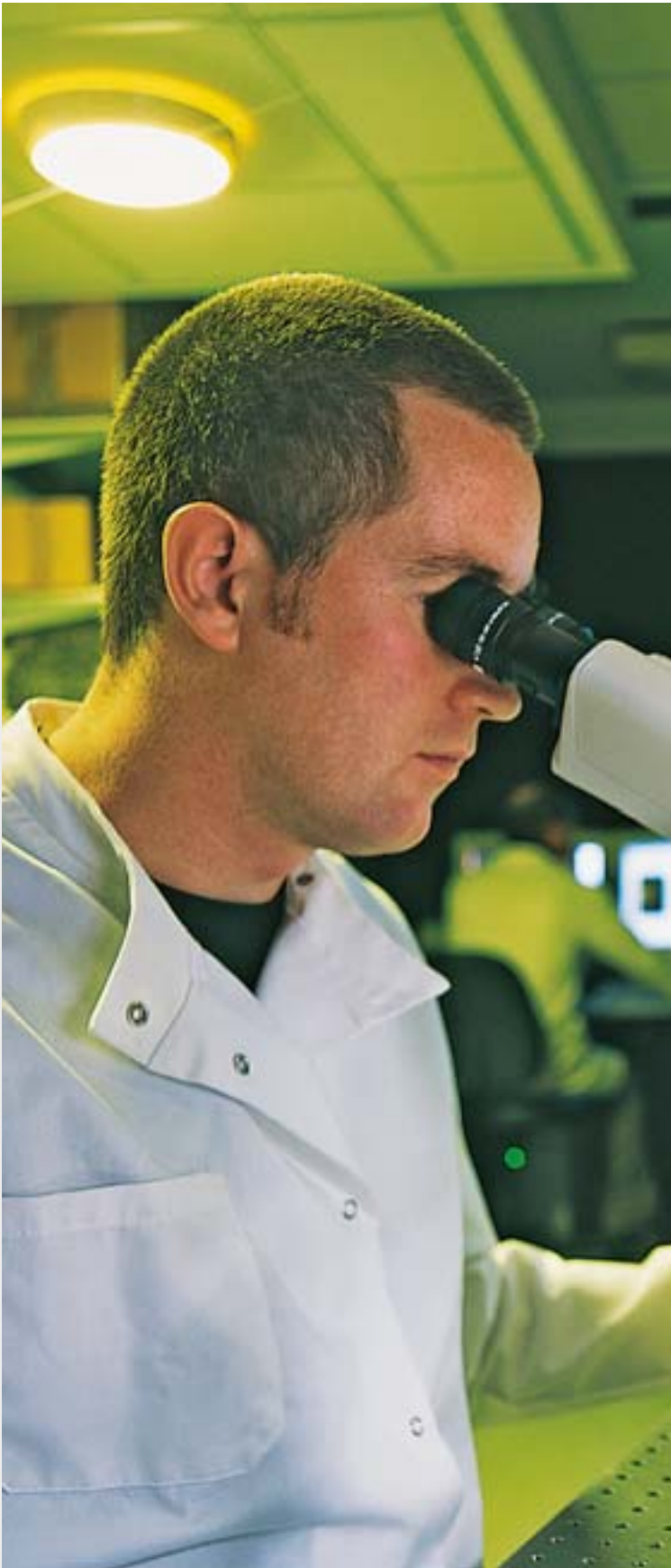
Work in the OR, in the wards or on emergency calls depends on the smooth functioning of all devices. That's why ODU is supplying the technologies that are helping doctors to help people.

ODU products in application in the medical technology



1. Know-how's pulse: medical cable with ODU connectors
2. Innovation down to the smallest detail: interfaces in magnetic resonance imaging
3. Blind faith in this system: cardiac support systems
4. Sure diagnoses in emergency cases: patient monitoring systems
5. Optimal efficiency in the OR: Mobile C-arm X-ray unit
6. Blood sugar measurement child's play: with ODU chip card reader for mobile laboratory

Measurement and testing technology

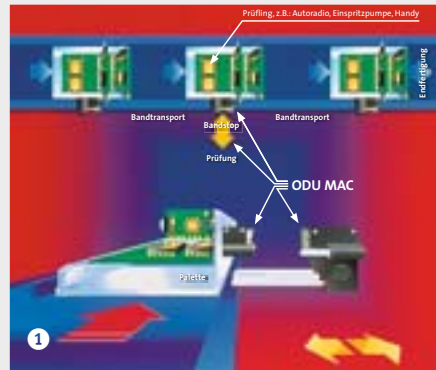
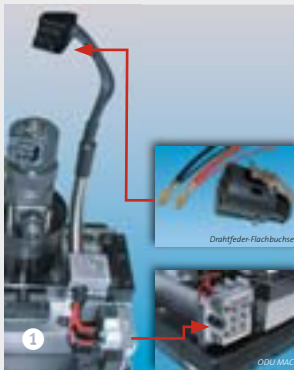


You can't permit any mistakes in your products? And your inspections and tests must be absolutely reliable, and be carried out quickly?

Then you need more than high-quality measuring instruments – you also need high performance connectors. Because the connection between the test piece and measuring instrument and between the measuring instrument and the evaluation unit usually faces harsher conditions than the measuring instruments themselves.

ODU has been producing connectors for measurement and testing technology for more than 60 years.

Quality in the quality inspection



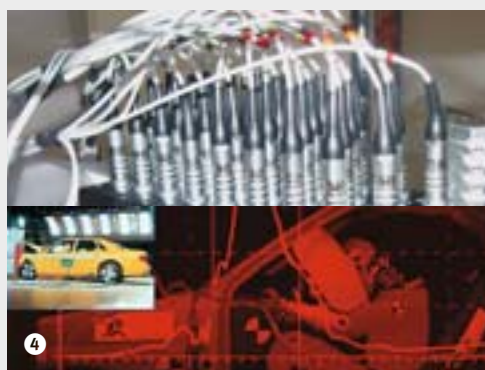
1. Contact at any tact: automatic inspection on the line

2. Between heat accumulation and cold shock: Climatic tests in tunnel test systems and climatic boxes

3. Devices for measuring...
 ... low-frequency magnetic fields
 ... radioactivity
 ... frequencies in mobile radio networks
 ... humidity



4. We're helping make cars safer
 Crash tests in the automotive industry



Innovations for automation engineering

Innovative solutions for your intelligent products



The goal of automation engineering is for a system to work fully independently. With the state of electronics today, this goal can be better reached than ever before.

Connector systems that are 100% reliable must be used here, because a system breakdown can sometimes result in very high costs. ODU supplies the quality that is needed here.



1. Always directly usable – portable programming devices
2. Drive systems, e.g., for production lines
3. Intelligent solution – complete industrial control



Industrial electronics and machine construction

We combine power and performance



1

It's been a long time since the fields of industrial electronics and machine construction were restricted to just the construction of machines, engines, drives, etc. Today, complex systems, innovative production lines, transport means, etc. are developed and built.

In this application area, every single component counts, and so connectors are a permanent component in these systems, where they usually act as high-capacity interfaces.



2

1. Automatic assembly machine
2. Pick-and-place PCB assembly machine
3. Plug-in unit for magnetic levitation train in Shanghai (Transrapid)
4. Precise to the millimeter – industrial laser



3



4

Telecommunication and mobile radio communication

So that connections connect reliably



The telecommunication and mobile radio communication sector is today far more than just telephones and cell phones. For years, it has also included the infrastructure (base stations, mini-links), without which the mobile radio communications and telecommunication networks could not even begin to work.

No matter which sector is involved – qualitatively high-grade and reliable connector systems are always needed here.



1. Always there – portable computers for mobile data acquisition
2. Exchange terminal – infrastructure
3. Do you read me? – portable radio devices



Military technology

Security under even the hardest use



As a result of the continuous development in the military technology sector (air space and ground), manufacturers of connector systems are constantly facing new requirements.

The focus here is always on the security of one's fellow citizens. For example, battlefield communication is one of the main topics in many countries.



1. Battlefield communication
2. Submarines – connection to sonar unit
3. MILAN /HOT anti-tank rockets
4. High performance flashlights for use in extreme environments
5. Firearms with laser light module
6. Portable computer – small, compact, light, robust



ODU globally

For a good connection



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