

# Competence in Measuring and Testing



[www.odu.de](http://www.odu.de)

„Quality is never an accident. It is always the result of intelligent effort.“ John Ruskin (1819–1900)

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 connections between the test piece, measuring instrument and between the measuring instrument and the evaluation unit usually face harder conditions than the measuring instruments themselves.

Changing connections frequently within a very short time puts an enormous strain on plugs and sockets. At the same time, the connections must be individually adapted to idiosyncrasies specific to the device and signal, while still being easy to operate.

ODU has been producing both standardized connectors and customized developments for over 60 years.

### CONTENTS:

- ▶ Inspecting and Testing from page 04
- ▶ Measuring from page 20
- ▶ Catalogue products from page 28
- ▶ Our company from page 34

Strong customer orientation, flexibility in development and manufacturing and an excellent price-performance ratio have earned us a top position in the market. Use our know-how and commitment for your business success!



## 4 It's the right connection!

### Inspecting and Testing with ODU

When we speak of INSPECTION, we mean the intermediate or final inspection of a component or device as a part of the mass production process. For example, cell phones, injection valves, video recorders, monitors, chips and PCBs pass through various inspections.

Inspection is always associated with the measurement of physical quantities, such as force, resistance, time or frequency. Inspections and tests require that components or devices can be connected and because of the usual high number of pieces, can result in many mating cycles for the interface connectors that are used.

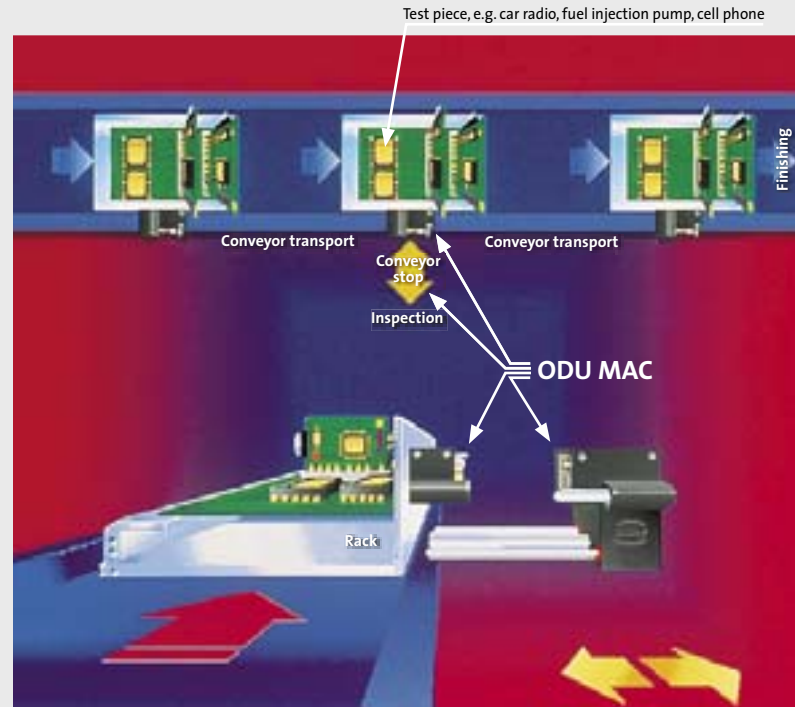
The connections are subjected to maximum demands, this is where the strength of the ODU solutions stands out. Material properties and mechanical details ensure reliable function.

## 5 Contact at any speed

### Automatic inspection on the production line



The racks with the test pieces run through the production line on conveyor belts. Each rack has an ODU MAC plug (header) and the test station has the mating component (socket). The conveyor is halted for the inspection, and docking is done automatically.

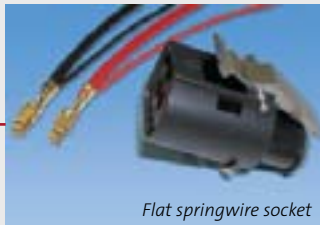


## 6 The endurance test – not only for the test piece

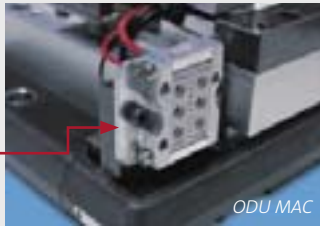
Example: Common-rail injection valves



The test cables are manually inserted on to the test piece and the work-piece carrier is then placed on the line; it runs through the inspection equipment automatically. Used here are the ODU MAC in aluminum frame and the flat springwire socket for connecting (adapting) the valves.



Flat springwire socket



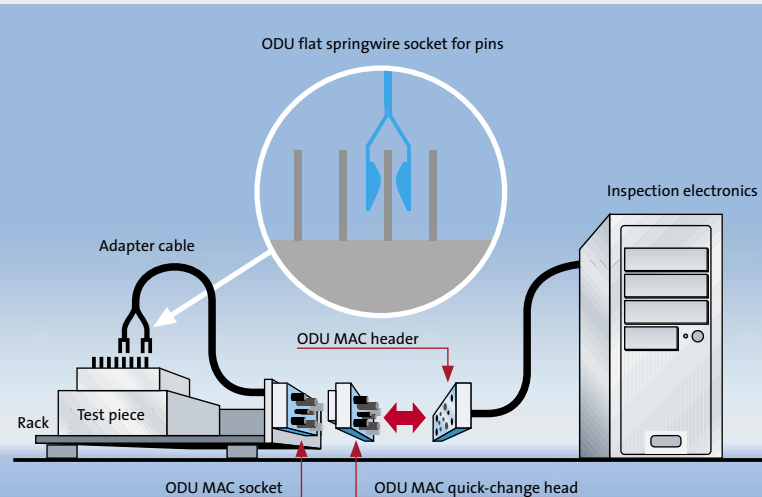
ODU MAC

## 7 Tactic for a high number of mating cycles



The ODU MAC quick-change head

The ODU MAC quick-change head is the choice for inspections on the line requiring a very large number of mating cycles. The advantage is that when maintenance is required, it isn't necessary to remove (unsolder) the entire test connector – instead, replacing the quick-change head is all it takes! The replacement can be done in less than a minute.

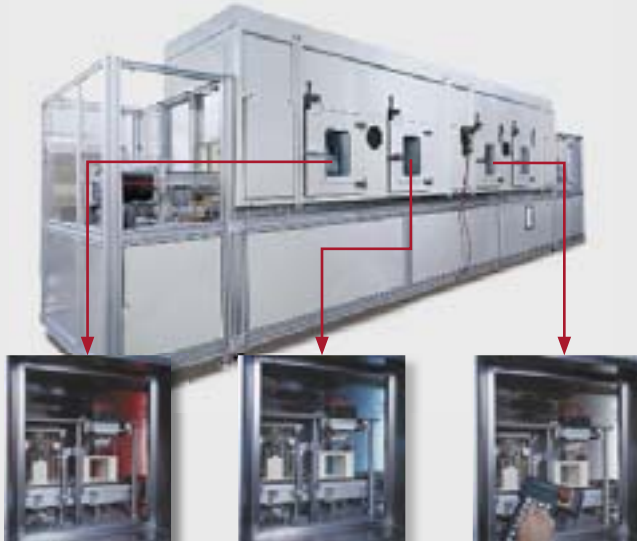


## 8 Between heat accumulation and cold shock

### Climate test in the tunnel test system

The system inspects electronic components in batch testing under simulated environmental conditions. The test pieces are continuously driven through the various climate zones.

The components are plugged into a rack and then sent through the test line. The ODU MAC is mounted in the separate climate zones. The mating component is found on each of the racks. When a piece reaches a climate zone, the flow stops and the rack is automatically connected using the ODU MAC.



## 9 Reception in any weather

### Tests in the climatic box

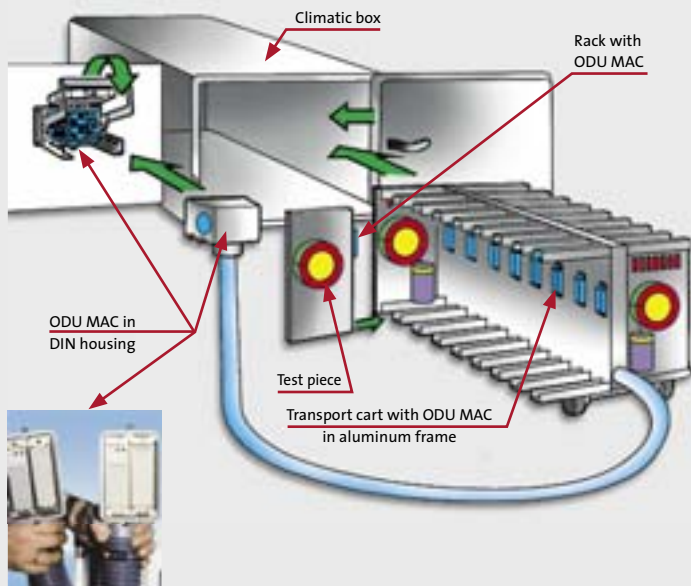
Cell phones, for example, are inspected in this climatic box. These tests are performed as a part of the development or manufacturing processes. The cell phone is connected using an ODU MAC in an aluminum frame.



## 10 Reliable connection in any weather

Frequency converter in the climatic chamber

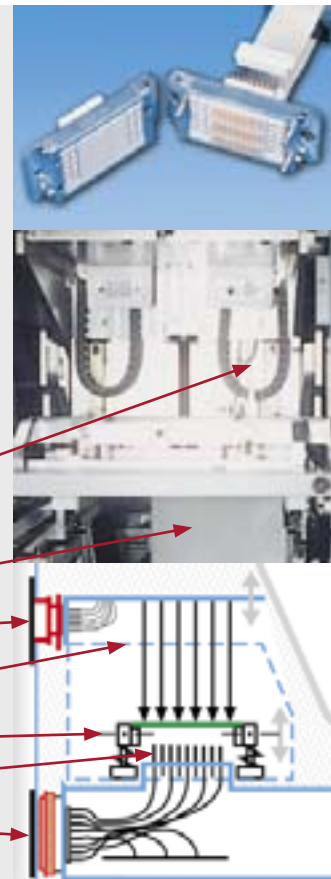
The test pieces are positioned in the cart by hand (contacting using ODU MAC in aluminum frame). The cart drives into the climatic chamber. The signal and power contacts are checked and taken out of the chamber, and the results are transmitted to the computer via an ODU MAC in double DIN housing.



## 11 Every pin sits right here

Functional test for printed circuit boards

Printed circuit boards are tested with a large number of spring-loaded pins (needle bed). The needle bed is coordinated to the printed circuit board layout. A separate needle bed is needed for each type of board. The spring-loaded pins of the needle bed are connected to the ODU MAC interface connector. The ODU MAC is disconnected and reinserted each time the program changes.



Upper plate with pneumatic system for pressing down and with positioning motors for adjusting

JIG

ODU MAC with power and pneumatic contacts

Pressure pad for adjusting

Drop-down conveyor

Needle bed

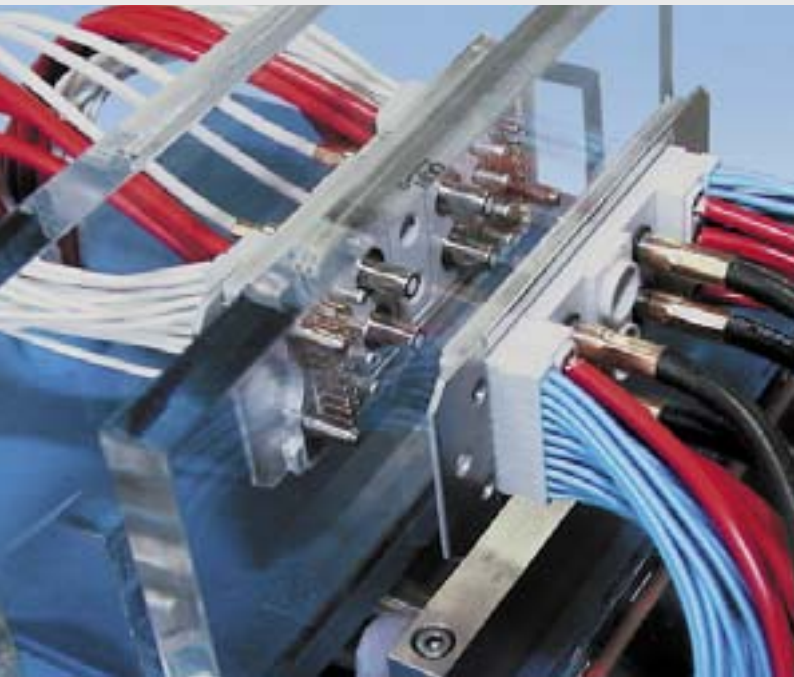
ODU MAC for changes in programs



## 12 Tried and tested millions of times

Mobile telephones put to the test

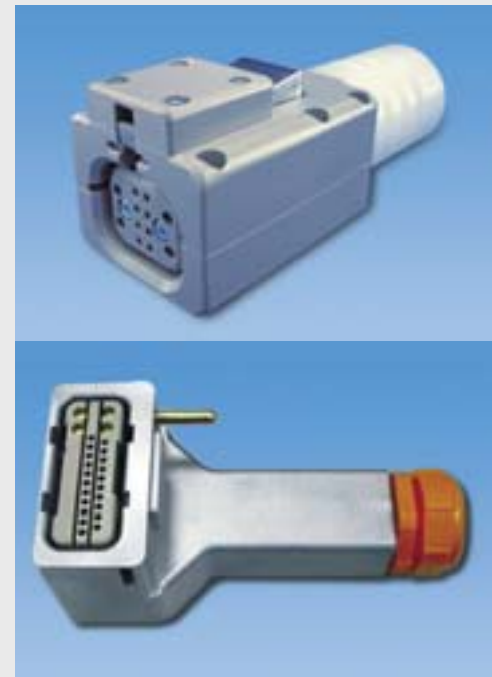
ODU MAC is used for inspecting cell phones in mass production, and has more than proven itself under conditions with an extremely high number of mating cycles. Around 300 million cell phones a year are inspected with ODU MAC.



## 13 From pin to connector

Constructing testing instruments with ODU parts

Manufacturers of test adapters buy ODU single contacts (springwire contacts) to use when building their own test connectors, for example, for the automobile industry.

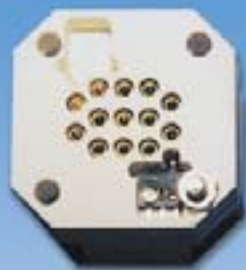




## 14 The whole is more than the sum of its parts

ODU test adapter for customized solutions

Following the customer's specifications, ODU builds complete test adapters and special inspection systems for a very high number of mating cycles with ODU springwire contacts and special pins.



## 15 For intelligent connections

Automotive suppliers rely on ODU test adapters

Suppliers to the automotive industry rely on complete test adapters from ODU for inspecting electronic components, such as windshield wiper motors and injection pumps. Flat springwire contacts form the interface.



*Inspection of windshield wiper motors*

*Inspection of injection pumps*



## 16 Proven convenience

### ODU test adapter

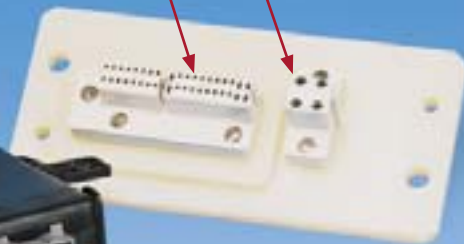
ODU builds complete test adapters for inspecting electronic components in vehicles, such as electric power windows and heaters for vehicle seats. The connection is often made using flat springwire sockets and round sockets.

The module built by ODU for inspecting heaters for vehicle seats is shown at the lower right. The mating component, the heater electronic component with the pins, is shown at the lower left.



Springwire socket  
for 0.64<sup>2</sup> pins

Flat springwire socket  
for pins 0.8 x 2.8



Pins: 0.64<sup>2</sup>

Pins: 0.8 x 2.8



## 17 Thoroughly tested

### Hardware and software tests

„GATT“ (Generic Automatic Test Tool) is a system for hardware and software tests for electric modules. These tests are performed during the development, for example, in the automotive industry. With ODU MAC in the DIN housing, the customized test pieces are connected to the test or inspection system.



## 18 We're there when cars collide

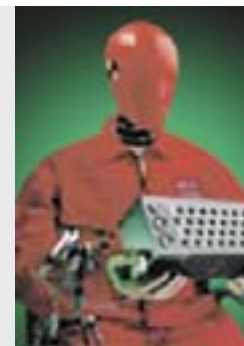
Crash tests in the automotive industry



System components for short-time data acquisition and processing (measurement boxes) during crash tests in the automotive industry are equipped with ODU MINI-SNAP Push-Pull connectors.

## 19

Test repetitions are very expensive, so nothing is left to chance. Each connection function must be absolutely reliable.



## 20 Measure us by the exact result!

Measuring with ODU connectors



## 21

In the smaller sense of the word, meaning when it is not done as a part of inspections and tests, MEASURING means recording physical quantities, such as displacement, pressure, temperature, radiation, humidity or acceleration by using measurement instruments.

Connecting the sensor and measuring instrument usually calls for specially suited connectors (such as push-pull connectors).

*Measuring instrument for oscillation and sound*



## 22 The fast connection

Push-Pull connector in high-speed measurement



One facility used for high-speed cameras is for recording and analyzing crash tests and airbag openings.

Cylindrical connectors with push-pull-locking (such as ODU MINI-SNAP) have become standard in the automotive industry.



## 23 Performance pays – not only when it comes to engines

Measurement boxes for engine test stands

The data acquisition modules are mounted on each individual engine mounting (rack), allowing the larger portion of the instrumentation to be handled off line.

Each module is equipped with a separate ODU MINI-SNAP for the transmission of data to the test computer.



## 24 We won't leave you out in the rain!

### Moisture measurement



The paper industry works with high-quality measurement systems. Measurements of grammage, moisture and thickness are carried out on moving sheets of paper. The measurements take place under extreme conditions, such as fast-paced production speeds (130 km/h) and high air humidity (approximately 90 %) levels. ODU MAC is the interface for the fastest possible docking and undocking of the measurement head.

## 25 Applications from A to Z

### Devices for measuring...

*...low-frequency magnetic fields with ODU MINI-SNAP*



*...oscillation and sound with ODU MINI-SNAP*

*...radioactivity with ODU MINI-SNAP*



## 26 Diverse solutions, carefully thought out

Devices for measuring...



*...early slag detection with customized development*



*...frequencies in mobile communications networks*



*...moisture with ODU MINI-SNAP*



*...flue gases (analysis computer) – connector with bayonet locking*

*...Tension and pressure with ODU MINI-SNAP*



## 28 Single contacts (round)

### Catalogue products

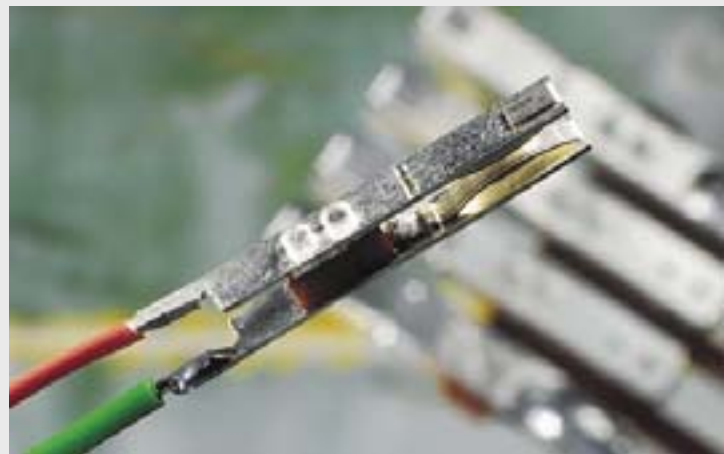
- ▶ Springtac™ and Lamella™ system
- ▶ Extremely high number of mating cycles (> 1 Mill.)
- ▶ Very secure connecting
- ▶ Low insertion and withdrawal forces
- ▶ Ø 0.6 mm to 50 mm
- ▶ Economical solution
- ▶ Modification of the catalogue model is possible



## 29 Single contacts (flat)

### Catalogue products

- ▶ Flat springwire sockets
- ▶ Extremely high number of mating cycles (> 100,000)
- ▶ Low insertion and withdrawal forces
- ▶ Constant contact resistance
- ▶ Very high level of contact stability
- ▶ High current-carrying capacity
- ▶ 2-point and 4-point measurement
- ▶ Version with quick-change head
- ▶ Modification of the catalogue model is possible
- ▶ Suitable for inspection of pins 0.64<sup>2</sup> and flat pins 0.8 mm x 1.6 mm to 6.3 mm



## 30 ODU MAC – the modular all-rounder

### Catalogue products

- ▶ Modular right-angle connector
- ▶ Signal, power, high power, fiber optics, pneumatic, fluid, BUS module for the ODU MAC system
- ▶ Extremely high number of mating cycles
- ▶ Versatile
- ▶ Vibration protection
- ▶ Also in DIN housing
- ▶ Modification of the catalogue model is possible



## 31 ODU MINI-SNAP – simply reliable

### Catalogue products

- ▶ Push-pull connectors made of metal
- ▶ 5 series: L, K, B, S, F
- ▶ 8 sizes, 1 to 40 contact positions, mixed insert arrangements, outer diameter 6.5 mm to 42 mm
- ▶ Over 300 catalogue inserts
- ▶ Certified to UL, MIL and VDE
- ▶ Solder, crimp, and print termination
- ▶ Large number of mating cycles
- ▶ IP 50 and IP 68
- ▶ Modification of the catalogue model is possible

Push-Pull connectors have many advantages regards: low space requirements, definite position (OPEN or CLOSED, can be inserted quickly and with eyes closed!)



## 32 As individual as you:

### Customized solutions

As a specialist for special solutions, ODU has combined all necessary technologies in one company. This allows us to tailor connectors to the customer's requirements.

## 33

Reasons for a customized solution can be:

- ▶ Function
- ▶ Design
- ▶ Exclusivity
- ▶ Costs



The ODU Company

More than a thousand companies around the world produce connectors and offer hundreds of catalogue products. Furthermore, many also develop and manufacture customized solutions for their customers. So what makes ODU qualified to be your partner for connectors?

Our magic words are: flexibility, proximity to customers and employee motivation. This is how we've established ourselves globally in demanding markets. With forward-looking new developments and reliable products, we contribute to our customers' success.



In the interest of our customers, we have used a powerful quality management system for years. The accreditation to DIN ISO 9001 was already obtained in 1994 in the first attempt, re-certification took place in 2000.

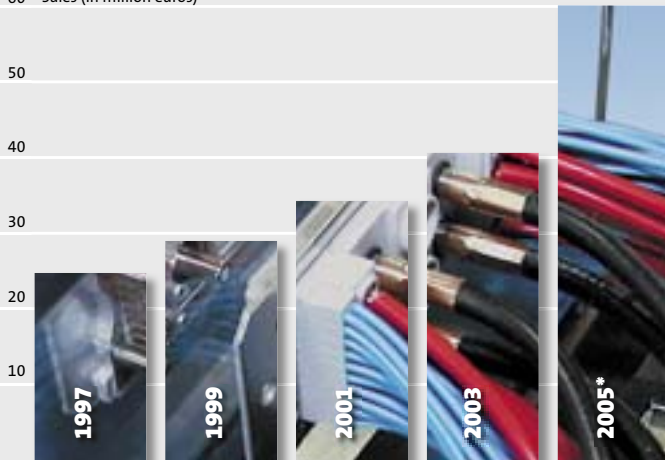
„If there is any secret to success, it lies in the ability to get the other person's point of view and see things from that person's angle as well as from your own.”  
Henry Ford (1863 – 1947)

## 36 Strong arguments for ODU

### ODU at a glance

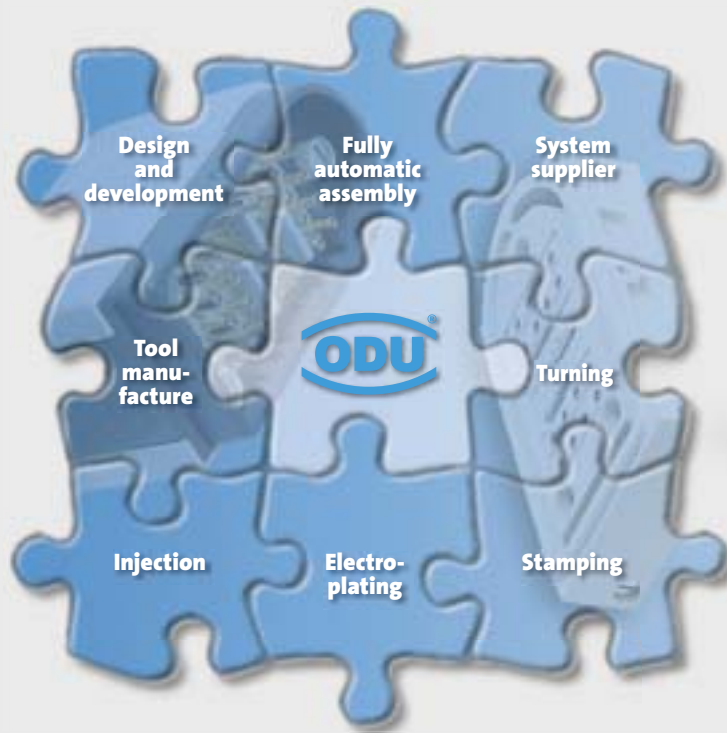
- ▶ 400 employees in Mühlendorf
- ▶ 30 development orders annually
- ▶ Sole-supplier to over 100 companies around the world, including Alcon, Ericsson, Hewlett-Packard, Philips, Siemens, Vorwerk and Zeiss
- ▶ Financially and Fundamentally independent
- ▶ More than 60 years of experience (founded in 1942)

60 Sales (in million euros)



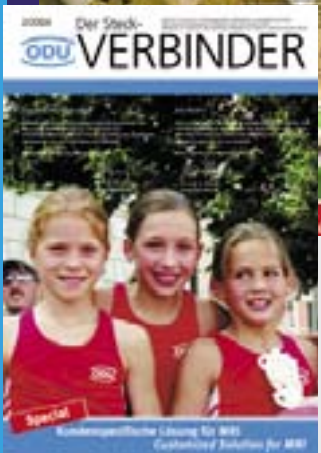
## 37 It all fits together here

All technologies under one roof



## 38 We keep in contact

Our internal and customer magazine „Der Steck-VERBINDER“



Are you interested in our internal and customer magazine „Der Steck-VERBINDER“?

Simply send us an E-Mail: [christa.muehlthaler@odu.de](mailto:christa.muehlthaler@odu.de)  
We would be happy to send you a printed copy.

You can find the PDF file on the Internet at: [www.odu.de](http://www.odu.de) > Download Area

## 39 Every link counts in this chain

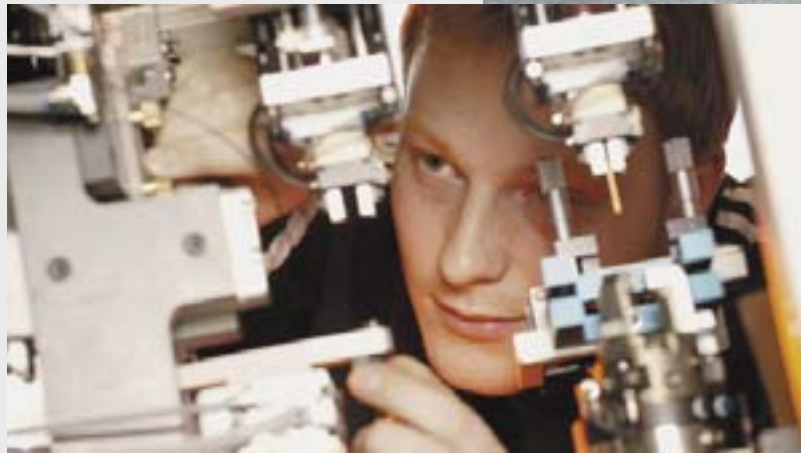
Employees at ODU – jobs with a future

ODU places great demands on its employees and expects top performances. That's why apprenticeship and further training, as well as personnel continuity, are very important to us.

*Turning machine setters*

*Apprentices and trainees*

*Toolmakers*





### **ODU Steckverbindingssysteme GmbH & Co. KG**

Pregelstr. 11  
D-84453 Mühldorf/Inn  
Tel.: +49 / 86 31 / 61 56 - 0  
Fax: +49 / 86 31 / 61 56 - 49  
E-Mail: zentral@odu.de  
Internet: www.odu.de

### **ODU France**

Phone: +33 / 1 / 39 35 - 46 90  
E-Mail: odu@odu.fr

### **ODU Scandinavia**

Phone: +46 / 176 18261  
E-Mail: peter.biloch@odu.se

### **ODU UK**

Phone: +44 / 15 09 - 266 433  
E-Mail: sales@odu-uk.co.uk

### **ODU USA**

Phone: +1 / 805 / 484 0540  
E-Mail: joe.cisi@odu-usa.com

### **ODU Shanghai Trading**

Phone: +86 / 21 / 58 34 7828 - 106  
E-Mail: chen.xin@odu.com.cn

### **ODU Shanghai Manufacturing**

Phone: +86 / 21 / 58 34 7828 - 106  
E-Mail:  
markus.bernhuber@odu.com.cn