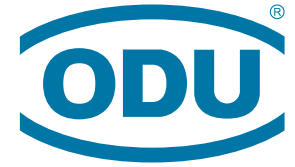


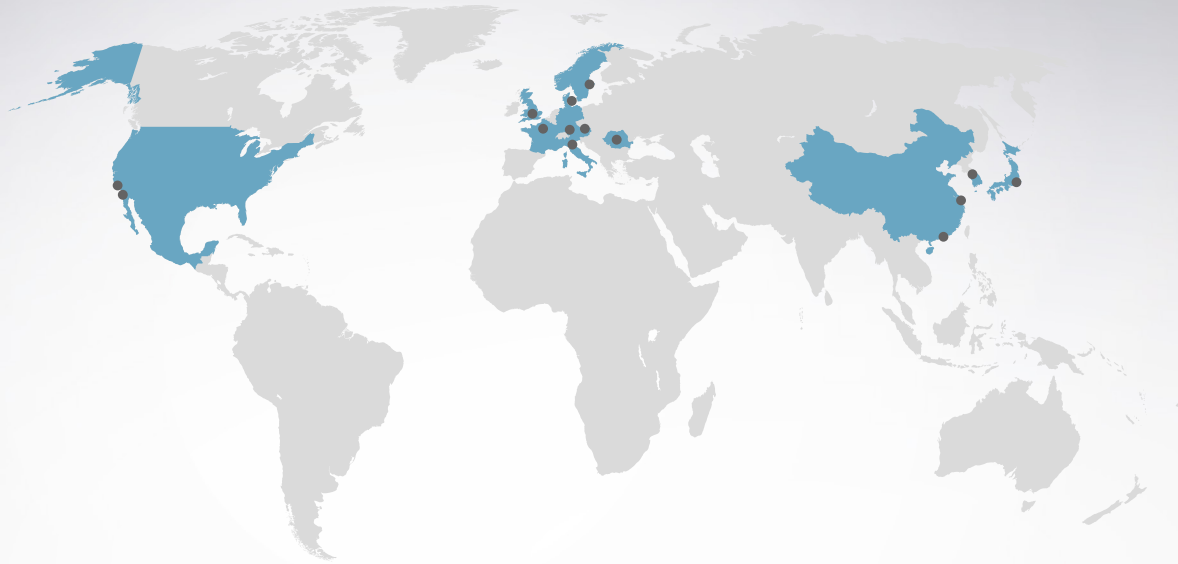
CONNECTOR SOLUTIONS



HDMI    
ODU HIGH SPEED DATA TECHNOLOGY

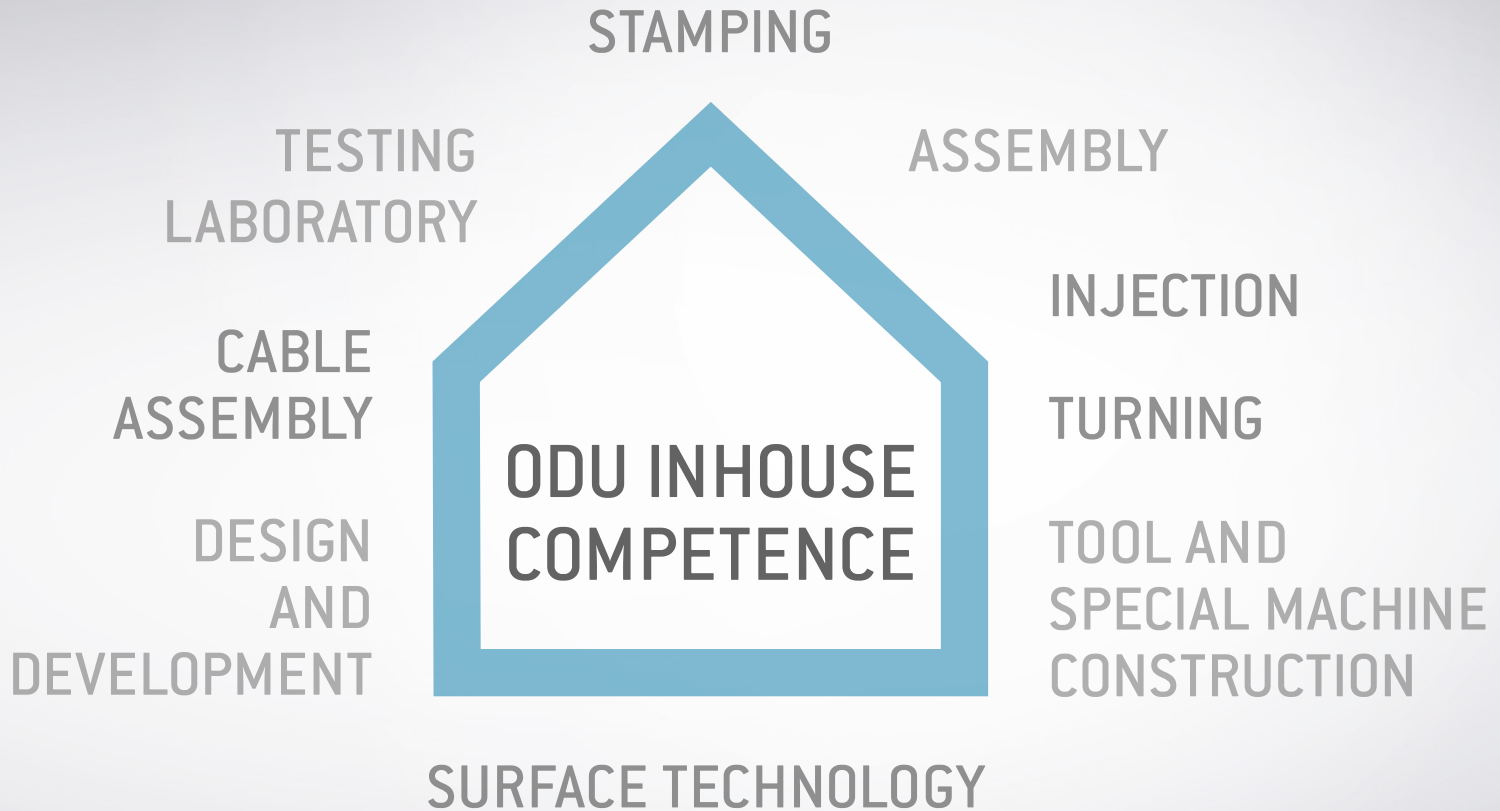


FACTS & FIGURES



- More than 80 years of experience in the connector technology
- Over 2,800 employees worldwide
- 160 R&D employees
- 170 apprentices and dual students
- 90,000 different products
- 80 % vertical integration
- 6,000 customers around the world
- 5 production and logistics sites: Germany, China, Mexico, Romania, USA
- 12 sales locations: Germany, Austria, China, Denmark, France, Hong Kong, Italy, Japan, Korea, Sweden, UK, USA

EVERYTHING UNDER ONE ROOF



FINDING BEST SOLUTIONS



MORE THAN A CONNECTION

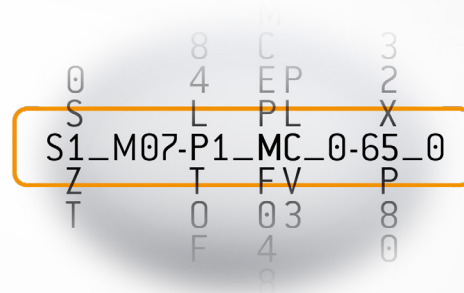
Contacts, connectors and cable assembly system solutions meeting the most demanding technical market requirements – ODU's connector solutions and value-added services are characterized by their exclusive focus on meeting the customer's requirements.

- Precise implementation of application-specific requirements regarding design, functionality, cost and exclusivity
- Modified connector solutions derived from standard products
- One-to-one local expertise and fair, friendly consulting
- Short product development and production paths

ODU Product Finder

Use the intelligent part number search to get information about the ODU product portfolio.

In the detailed product presentation you will find information on suitable assembly tools and accessories.



PLASTIC CIRCULAR CONNECTORS

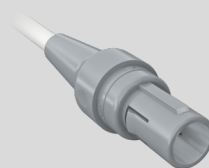
ODU MEDI-SNAP® PUSH-PULL

- Up to IP68
- Autoclavable & fully sterilizable
- IEC 60601-1 compliant housings¹
- Right angle version available



ODU MEDI-SNAP® BREAK-AWAY

- Up to IP68
- Autoclavable & fully sterilizable
- Up to 5,000 mating cycles



ODU MEDI-SNAP® HIGH-VOLTAGE

- Touch proof according to IEC 60664-1
- 2x HV, 2x signal interlock, 1x ground/FMLB
- Nominal voltage up to 1,000 V AC / 16 A
- Hot-plugging prevention



ODU MINI-MED®

- Space saving design
- Pre-assembled solution
- Up to 1,000 mating cycles



Coding	Sizes	No. of possible mechanical coding	Diameter plug (mm)	Max. cable diameter (mm)	Max. No. of contacts	Solder cup	Crimp	PCB
Pin and groove	1	6	13.7	6.5	14	•	•	•
	2	3	18.5	9.2	34	•	•	•
	3.5	2	23	10.5	41	•	—	•
Pin and groove	1	6	15.8	7.5	14	•	—	—
	2	1	19	11.5	26	•	—	—
Pin and groove	2	3	18.5	9.2	5	•	—	—
Pin and groove	1	1	11.5/ 11.2	4.4	6	•	—	—

¹ Up to 2 MOPP / 2 MOOP – working voltage of medical device max. 250 V AC

	IP class in mated condition	IP class in unmated condition	Mating cycles plug	Mating cycles receptacle	Locking principle	Coding options (optical)	Transmission options
ODU MEDI-SNAP® PUSH-PULL	Up to IP64	Up to IP68	> 2,000	> 5,000	Push-pull	Arrow marking, color coding	Signal, power, fluids, fiber optic
	Up to IP68	Up to IP68					
ODU MEDI-SNAP® BREAK-AWAY	Up to IP67	Up to IP68	> 5,000	> 5,000	Break-away	Arrow marking, color coding	Signal, power
	Up to IP64		> 2,000				
ODU MEDI-SNAP® HIGH-VOLTAGE	Up to IP64	IP50	> 2,000	> 5,000	Push-pull	Arrow marking, color coding	High-voltage
ODU MINI-MED®	IP67	IP50	> 1,000	> 1,000	Break-away	Arrow marking	Signal



ODU MEDI-SNAP® Size 3.5

METAL CIRCULAR CONNECTORS

ODU MINI-SNAP® L

- IP50
- 5,000 mating cycles
- IEC 60601-1 compliant option
- USB® 3.2 Gen 1x1 + USB® 2.0 + Ethernet



ODU MINI-SNAP® K

- IP68
- 5,000 mating cycles
- IEC 60601-1 compliant option
- USB® 3.2 Gen 1x1 + USB® 2.0 + Ethernet



ODU MINI-SNAP® B

- IP68
- 5,000 mating cycles
- USB® 3.2 Gen 1x1 + USB® 2.0 + Ethernet



Coding	Sizes	No. of possible mechanical coding	Diameter plug (mm)	Max. cable diameter (mm)	Max. no. of contacts	Solder cup	Crimp	PCB
Pin and groove	00	8	6.4	3.5	04	•	•	•
	0		9	5.6	10			
	1		11.5	7.7	16			
	2		14.5	9.9	26			
	3		17.5	11.9	30			
	4	25.0	16.0	40				
Pin and groove	0	8	11.0	5.0	10	•	•	•
	1		13.0	7.0	16			
	2		16.0	9.0	26			
	3		19.0	10.5	30			
	4		25.0	14.0	40			
Pin and groove	0	8	9.4	5.0	10	•	•	•
	1	9	12.0	7.0	16			
	2	10	15.0	9.0	26			
	3	13	18.0	10.5	30			

	IP class in mated condition	IP class in unmated condition	Mating cycles	Transmission options
ODU MINI-SNAP® L	IP50	Up to IP68 (only for receptacles)	> 5,000	Signal, data, power
ODU MINI-SNAP® K	IP68	Up to IP68	> 5,000	Signal, data, power
ODU MINI-SNAP® B	IP68	Up to IP68	> 5,000	Signal, data, power



METAL CIRCULAR CONNECTORS

ODU MINI-SNAP® F

- IP50 and IP68
- 5,000 mating cycles
- Ethernet + USB® 2.0



Coding	Sizes	No. of possible mechanical coding	Diameter plug (mm)	Max. cable diameter (mm)	Max. no. of contacts	Solder cup	Crimp	PCB
Half shell	0	3	9.4	5.0	09	•	•	•
	1		12.0	7.5	14			
	1.5		13.0	7.5	19			
	2		15.0	9.5	19			
	3		18.0	11.5	27			

	IP class in mated condition	IP class in unmated condition	Mating cycles	Transmission options
ODU MINI-SNAP® F	Up to IP68	Up to IP68	> 5,000	Signal, data, power



HIGH-SPEED & HIGH-DENSITY CONNECTORS

ODU AMC® HIGH-DENSITY

- 70% weight and size reduction
- IP6K8 (20 m submersion)
- Chrome plated version available
- USB® 3.2 Gen 1x1 + USB® 2.0 + HDMI® + Ethernet



ODU AMC® HIGH-DENSITY SCREW-LOCK

- High vibration resistance
- 70% weight and size reduction
- IP6K8 (20 m submersion)
- USB® 3.2 Gen 1x1 + USB® 2.0 + HDMI® + Ethernet



ODU AMC® PUSH-PULL

- IP68 / IP6K9K
- > 5,000 mating cycles
- High speed data technology
- Quick and easy mating and locking



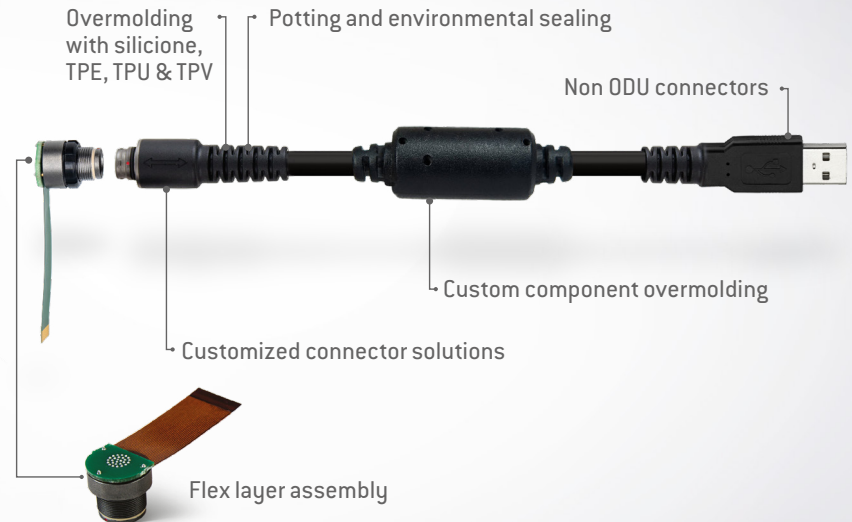
ODU AMC® BREAK-AWAY

- IP68 / IP6K9K
- > 5,000 mating cycles
- High speed data technology
- Quick and easy demating and locking



Coding	Sizes	No. of possible mechanical coding	Diameter plug (mm)	Max. cable diameter (mm)	Max. no. of contacts
Pin and groove	00	4	9.8	5.0	7
	0		12.8	7.0	16
	1		14.8	8.5	27
Pin and groove	00	4	9.8	5.0	7
	0		12.8	7.0	16
	1		14.8	8.5	27
Pin and groove	0	4	14.0	5.5	10
	1		15.9	6.5	16
	1.5		16.5	8.0	19
	2		19.6	10.0	26
	3		23.9	11.5	37
	4.5		33.0	17.5	55
Pin and groove	0	4	11.9	5.5	10
	1		13.9	6.5	16
	1.5		15.9	8.0	19
	2		17.6	10.0	26
	3		21.9	11.5	37

	Solder cup	Crimp	PCB	IP Class in mated condition	IP Class in unmated condition
ODU AMC® HIGH-DENSITY	●	—	●	IP6K9K	IP68
ODU AMC® HIGH-DENSITY SCREW-LOCK	●	—	●	IP6K9K	IP68
ODU AMC® PUSH-PULL	●	—	●	Up to IP6K9K	IP68
ODU AMC® BREAK-AWAY	●	—	●	Up to IP6K9K	IP68



HIGH-SPEED & HIGH-DENSITY CONNECTORS

ODU AMC® Easy-Clean

- Fast and easy cleaning
- Break-away function
- > 5,000 mating cycles
- Contact inserts with pogo pins



ODU AMC® Series T

- 3-way lock to 1 receptacle: push-pull, break-away or thread-lock
- High vibration resistance
- Waterproof in accordance with MIL-Standard 810
- Field assembly capability



ODU AMC® NP

- Current rating up to 7.5 A per contact
- > 2,000 mating cycles
- Break-away function



Coding	Sizes	No. of possible mechanical coding	Diameter plug (mm)	Max. cable diameter (mm)	Max. no. of contacts
Pin and groove	0	4	11.9	5.5	7
	1		13.9	6.5	16
	1.5		15.9	8.0	19
Pin and groove	9	4	18.4	7.6	10
			18.5		
			21		
	12		24.2	14.6	18
			24.9		
	26				
Pin and groove	6	11	12.4	6.65	7

	Solder cup	Crimp	PCB	IP class in mated condition	IP class in unmated condition
ODU AMC® Easy-Clean	•	–	•	Up to IP6K9K	IP6K8
ODU AMC® Series T	•	•	•	Up to IP6K9K	IP68
ODU AMC® NP	•	•	•	IP68 20 m (120 min.)	IP68 20 m (120 min.)



MODULAR CONNECTORS



	ODU-MAC® Blue-Line Flexible universal solution	ODU-MAC® White-Line Manual mating
Mating cycles	> 10,000	> 100,000
Mating type	Manual mating, automatic docking	Manual mating
Automatic docking	1 frame, 4 sizes	—
Locking	Per spindle / Locking lever / Push-pull (PUSH-LOCK)	Per spindle / Locking lever / Snap-In (ZERO)
Housing	Available in plastic and metal	Available in plastic and metal
Non-magnetic version	—	•



	ODU-MAC® Silver-Line Connector for docking systems	ODU DOCK Silver-Line Automatic docking for robots
Mating cycles	Up to 10 million	Up to 10 million
Mating type	Automatic docking	Automatic docking
Automatic docking	6 frame variants, individual length, quick change head option	3 sizes quick change head option
Locking	—	—
Housing	Strain relief housing	3 housing varieties available in plastic and metal
Non-magnetic version	●	—

MODULAR CONNECTORS – VARIETY OF MODULES



	ODU-MAC® Blue-Line Flexible universal solution	ODU-MAC® White-Line Manual mating
Signal	Up to 33 A / 2.5 mm ²	Up to 27 A / 1.5 mm ²
Power	Up to 58 A / 6 mm ²	Up to 119 A / 16 mm ²
High current	Up to 225 A / 50 mm ²	Up to 225 A / 50 mm ²
High voltage	Up to 4 kV / 1 mm ²	Up to 6.3 kV / 0.25 mm ²
Coax	Up to 12 GHz	Up to 9.0 GHz
Compressed air	–0,8 up to 12 bar	–0,8 up to 20 bar
Fluid	Up to 10 bar	Up to 25 bar
Fiber optic POF/GOF	PC / APC / Expanded Beam	PC / APC / Expanded Beam Performance
Transfer rates / high-speed	SPE / CAT 6 _A / USB® / HDMI® / DisplayPort®	SPE / CAT 6 _A / USB® / HDMI® / DisplayPort®
Optional pin protection	Integrated with 20-pin signal module	Integrated with 20-pin signal module or freely positioned
Termination technology	Crimp / solder cup / PCB terminated	Crimp / solder cup / PCB terminated

	ODU-MAC [®] Silver-Line Connector for docking systems	ODU DOCK Silver-Line Automatic docking for robots
Signal	Up to 27 A / 1.5 mm ²	Up to 27 A / 1.5 mm ²
Power	Up to 119 A / 16 mm ²	Up to 119 A / 16 mm ²
High current	Up to 225 A / 50 mm ²	Up to 225 A / 50 mm ²
High voltage	Up to 6.3 kV / 0.25 mm ²	Up to 2.5 kV / 1.5 mm ²
Coax	Up to 9.0 GHz	Up to 9.0 GHz
Compressed air	-0,8 up to 20 bar	-0,8 up to 20 bar
Fluid	Up to 25 bar	Up to 10 bar
Fiber optic POF / GOF	PC / APC / Expanded Beam Performance	PC / APC / Expanded Beam Performance
Transfer rates / high-speed	SPE / CAT 6 _A / USB [®] / HDMI [®] / DisplayPort [®]	SPE / CAT 6 _A / USB [®]
Optional pin protection	Integrated with 20-pin signal module or freely positioned	-
Termination technology	Crimp / solder cup / PCB terminated	Crimp / solder cup



Tolerance compensation
up to +/- 4 mm

ELECTRICAL CONTACTS



	ODU SPRINGTAC®	ODU SPRINGTAC® Flatsocket	ODU LAMTAC®
Primary attribute	High mating cycles	Test & measurement	High current
Contact technology	Springwire technology	Springwire technology	Lamella technology
Contact security	🔒🔒🔒	🔒🔒🔒	🔒🔒
Points of contact	360° circular	Double sided	360° circular
Contact diameter	From 0.76 mm	From 0.64 x 0.64 mm	From 1.0 mm
Mating cycles	> 100,000 (up to 1 million)	> 50,000	> 10,000
Operating temperature range	-40° C to +125° C	-40° C to +125° C	-40° C to +150° C
High temperature range	Up to +300° C (on request)	–	–
Surfaces	Ag / Au	Ag / Au	Ag / Au
Termination technologies	Crimp / screw / solder cup	Crimp / solder cup / QCH (quick change head)	Crimp / screw / solder cup
Current (Ø 6 mm / 16 mm²) per IEC 60512-5-2:2002	110 A	–	115 A
Contact material	CuSn alloy or CuBe	CuSn	CuBe alloy

GET YOUR SOLUTION
engineering@odu.de



ODU TURNTAC®

Primary attribute	High volume
Contact technology	Turned, slotted contacts
Contact security	🔒
Points of contact	4 and 6 tines circular
Contact diameter	From 1.5 mm
Mating cycles	> 10,000
Operating temperature range	-40° C to +125° C
High temperature range	-
Surfaces	Ag / Au
Termination technologies	Crimp / screw / solder cup
Current (Ø 6 mm / 16 mm ²) per IEC 60512-5-2:2002	100 A
Contact material	CuZnPb



MASS INTERCONNECT SOLUTIONS

- + Reliable contacting due to multi-stage guiding
- + 8 tensioning points ensure an even and safe connection
- + Flexible and optimal interface configuration thanks to the modular connector system
- + Short delivery time



	Compact Class	12-Flex TWO M	12-Flex TWO M Tabletop	12-Flex FOUR A
Mating principle	Hand lever	Hand lever	Hand lever	Electromechanical (Remote possible)
Configuration	Rack mount	Rack mount	Tabletop	Rack mount / Inline tester
Max. signals	1,536	2,304	2,304	4,608
Resistance coding (optional)	–	•	•	•
RFID coding (optional)	•	•	•	•
Condition monitoring (optional)	•	•	•	•
Slide mount (optional)	–	•	–	•
Platform (optional)	•	•	already integrated	•

CUSTOM CONNECTOR SOLUTIONS

Requirements	Achievements
High-current	2,400 A
High-voltage	56 kV (DC) / 36 kV (AC)
Water protection	IP67 / IP68 / IP69K / IP6K9K
Vacuum tightness	1×10^{-9} mbar l/s
Salt spray	700 hours
EMC / EMI protection	> 75 dB (0 – 5 MHz) / > 65 dB (5 MHz – 500 MHz)
High-speed data rate	USB [®] 3.2 Gen 1x1 – 5 Gbit/s / HDMI [®] 1.4 – 14.4 Gbit/s / 10 Gbit Ethernet – 10 Gbit/s
Operating temperature	Up to 300 °C
Pressure	650 bar (9,427 psi) operating receptacle / 500 bar (7,251 psi) operating mated condition / 1,000 bar (14,503 psi) burst
Vibration	LV214 Severity Level 4 (20 g, 10 – 2,000 Hz, 22 h) Four-time multisinus per three-dimensional axis (16 g, 20 – 2,000 Hz, 65 h per axis)
Mating cycles	Up to 10 Million with Quick Change Head
Hydraulic connection	25 bar (362 psi) operating
Pneumatic connection	20 bar (290 psi) operating
Fiber optic	Insertion loss >0.7 dB (Singlemode) / >0.3 dB (Multimode) with 25,000 mating cycles (Expanded Beam Performance)
Magnetic permeability	Magnetic permeability $\mu_r < 1.0005$
Environmental	Salt spray / fog, chemical resistance, UV, Arizona dust, radiation, sterilization
Shock	1,000 g
Contact density	1 contact / mm ²
Smallest contact diameter	0.3 mm
Smallest circular connector diameter	5 mm
On driving test	Electric vehicle adapter
Self finding solutions	± 5 mm float (shield and tight)



RELIABLE CONNECTOR SYSTEM SOLUTIONS

GET YOUR SOLUTION
cable-assembly@odu.de



Standard cables and accessories

- + For circular and modular connectors assembled by ODU
- + Standard cables and accessories from a predefined pool of purchases
- + Quick and easy offer
- + Fast delivery and fast samples



Customer-specific overmoldings

- + Very cost-effective tooling
- + Customer-specific shapes of overmolding
- + Worldwide availability
- + Short delivery times

Silicone-overmolded system solutions

- + Specified up to 500 autoclaving cycles
- + Hygienic surface with prevention of the stick-slip effect
- + Bend protection due to special shape of overmolding
- + Medical technology testing according to DIN EN ISO 10993-5
- + Individual laser marking possible (in accordance with the UDI)



HDMI    
ODU HIGH SPEED DATA TECHNOLOGY

High speed data assemblies

- + Rugged housing
- + USB®, HDMI®, DisplayPort®, Ethernet, SPE
- + Available in any length within specification

FIBER OPTIC

Expanded Beam Performance

This is an advanced fiber optic solution available in a variety of connector series to meet the full range of application requirements.

- + Minimum maintenance necessary
- + Durable contact technology
- + Excellent optical performance under every condition



Contact Technology (EBP)

- 50,000 mating cycles
- No cleaning, only if necessary
- -65 °C to +105 °C
- Insertion loss*
SM: < 0,35 dB (typical) / < 0.7 dB (max.)
MM: < 0,15 dB (typical) / < 0.3 dB (max.)
- Return loss*
SM: > 60 dB (typical) / ≥ 55 dB (min.)
MM: > 45 dB (typical) / ≥ 35 dB (min.)

	ODU MEDI-SNAP®	ODU AMC® Series T	ODU MINI-SNAP® Series K	ODU-MAC® White-Line / Silver-Line
Special feature	Light weight / Non-magnetic	Ruggedized	Smallest footprint (OD 16.2 mm)	Automatic docking / Manual mating / Hybrid / Non-magnetic
Mating cycles	2,000	5,000	5,000	50,000
IP rating	IP64	IP6K9K	IP68	IP50 to IP67
Temperature	-40 °C to +85 °C DIN EN IEC 61300-2-47	-40 °C to +85 °C TIA/EIA-455-4C	-40 °C to +85 °C DIN EN IEC 61300-2-47	-40 °C to +85 °C DIN EN IEC 61300-2-47
Locking system	Push-pull	Push-pull / Threaded	Push-pull	Spindle / Transverse / Lever
Housing material	Plastic	Metal	Metal	Metal / Plastic

* Values are defined per contact side

FIBER OPTIC

System solutions

Even under environmental stress, the Expanded Beam Technology maintains high performance for up to 100,000 mating cycles while being easy to clean.

The ODU Fiber Optic portfolio also includes reliable physical contact and cost effective polymer optical-fiber system solutions, all available for circular and modular connectors.



Modular fiber optic solutions

- + GOF (multimode/singlemode) and POF system solutions
- + Fiber-only and hybrid systems
- + High number of mating cycles
- + Available as fully assembled solutions



Expanded Beam Performance

Expanded Beam

Physical Contact

Polymer Optical Fiber



Printed on certified
recycled paper.

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 that are derived from the respective standard data transmission protocol.

All dimensions are in mm.
Some figures are for illustrative purposes only. Subject to change without notice. Errors and omissions excepted. We reserve the right to change our products and their technical specifications at any time in the interest of technical improvement. This publication supersedes all prior publications.

ODU CONNECTOR SOLUTIONS / B / 0325 / EN

This publication is also available as a PDF file that can be downloaded from www.odu-connectors.com