A PERFECT ALLIANCE.

ODU HIGH-SPEED CONNECTIONS

Satisfy all standards and set new benchmarks.

DATA TECHNOLOGY

ODU – AN OVERVIEW

- More than 70 years of connector experience
- Turnover of € 135 million
- Over 1,650 employees worldwide
- 7 sales subsidiaries: China, Denmark, France, Italy, Sweden, UK and the USA
- Technologies: Design and development, machine tool and special machine construction, injection, stamping, turning, surface technology, assembly and cable assembly
- We operate in the following markets: medical, measurement and testing, military and security, industrial, energy, automotive

Certified quality

- DIN EN ISO 9001
- DIN ISO TS 16949
- DIN EN ISO 14001
- ISO 13485
- Vast range of UL, CSA, SCA, VG, MIL and VDE approvals
- UL-certified cable assembly

CUSTOMER-SPECIFIC SOLUTIONS

Contacts, connectors and cable assembly to meet the highest technical requirements – the products and services provided by ODU are characterized by their uncompromising customer and results-oriented focus.

- Precise implementation of the application-specific stipulations as regards to the design, function, cost and exclusivity
- Customized connector solutions originated from standard products
- Know-how and project dedicated resources under one roof
- Fast prototyping and quick production turn around

CREATING CONNECTIONS, BUILDING ALLIANCES, RELYING ON EACH OTHER

Technology that unites; connections that inspire

This is the driving force that we are committed to for more than 70 years: We provide high quality and innovative electrical connectors that create added value for our customers, and for all those that require the highest degree of efficiency and reliability in transmitting power, signals, data and media.

A PERFECT ALLIANCE – our belief is to develop the perfect connection. This translates not only in providing high quality and cost effective connector solutions, but also in developing strong partnerships based on trust and reliability as well as respect for our staff.
A PERFECT ALLIANCE based on mutual benefits, for products, companies and people.

ODU is one of the world's leading connector systems supplier and employs more than 1,650 people worldwide, generating sales of approximately 135 million Euros. Our products are technologically advanced and meet the highest quality standards. To achieve all this, we continuously invest in the development and production – ultimately in our very special expertise. In recent years numerous customer-tailored, application-specific connectors have led to an ongoing expansion of our standard product range, so that we now cover a broad spectrum of application areas. The balance between project work with its customer-specific solutions and the design-in of standard connectors will continue to shape our business in the future. This not only applies to emerging markets such as medical, military and security, and energy, but also to the special requirements of industrial electronics, measurement and testing, and automotive technology.

A PERFECT ALLIANCE – ODU Group's future growth relies on providing reliable connector solutions for various challenging applications and on our commitment to continuously expand our technology portfolio. This company brochure is our invitation to discover more information about ODU Group. We are an international technology company that devoted itself to create high quality customer oriented connector solutions.

Our creativity and innovative drive shape the future of our company and creates significant value for our customers.

ODU – A PERFECT ALLIANCE.

Dr. Joachim Belz

Dr.-Ing. Kurt Woelfl

ODU AND HIGH-SPEED – A PERFECT ALLIANCE

ODU provides reliable and innovative solutions to meet the demands of modern high-speed data transmission applications worldwide. ODU connectors provide ideal interfaces, ensuring high quality and reliability for high frequency data transmission for both analog and digital signals.

The high-speed transmission of data is a common requirement in a vast range of applications. Most of the time the connectors must be resistant to moisture, vibration and they must provide high mating cycles.

Standard interfaces connectors such as USB or RJ45, offer only very limited possibilities for these types of application requirements. Likewise, the integration of standard connectors in existing housings leads to substantial compromises in size, weight, handling and cost.

For these challenges ODU offers tailored solutions from a single source and without compromise. ODU provides reliable solutions for high data transmission and rugged applications.

- Large number of mating cycles
- Absolute contact stability for reliable operation
- High product functionality
- Unique plug position for safe working
- High current carrying capacity
- Flexible modularity
- Compact size
- Highest possible transmission reliability

All ODU connector systems are individually designed to customer requirements.

Reliable contact quality

The proven reliability of the lamella and springwire contacts guarantees optimal transmission quality.

Flexible modularity

A large number of different modules for power, data, signal and media transmission.

Environmental resistance

Heat, dirt, water and oil can quickly block connection points. ODU offers connectors in configurations with particularly high seal tightness (e.g. IP 69).

Safe cleaning

Autoclavable and sterilization safe connector solutions available for medical applications.

Compact style

High contact density, right-angle connectors and minimized housing models allow the use in the most compact applications.

Tried-and-tested in industry

Reliable connector solutions for rugged applications.

Large number of mating cycles

ODU connectors enable up to one million mating cycles.




UNLIMITED APPLICATIONS




WORLDWIDE NETWORK – FAST AND RELIABLE

Data transmission is an important requirement and the demands on connectors are many: these include compact design, reliable use and a high transmission bandwidth. The approved ODU connector series (e.g. Push-Pull circular connectors, modular rectangular connectors and AMC connectors) combine these requirements and enable high-speed transmissions of the highest quality.

FOR INDOOR AND OUTDOOR USE

- Robust for long life
- Compact design
- High density
- Small sizes, lightweight

Ethernet

The industrial standard for the supply of computers and electronic devices with information and energy within a network. Data transfer rates between **10 Mbit/s and 10 Gbit/s.**

USB 2.0

The Universal Serial Bus (USB) is a serial bus system designed for connecting a computer to external devices. Data transfer rates range from **12 Mbit/s to 480 Mbit/s.**

STANDARD COMMUNICATION PROTOCOLS

HDMI

The High Definition Multimedia Interface is an interface for the complete digital data transmission of image and sound data. Data transfer rates of up to **8.16 Gbit/s.**

USB 3.0

A further development of the USB 2.0 with a data transmission rate of **up to 5 Gbit/s**.

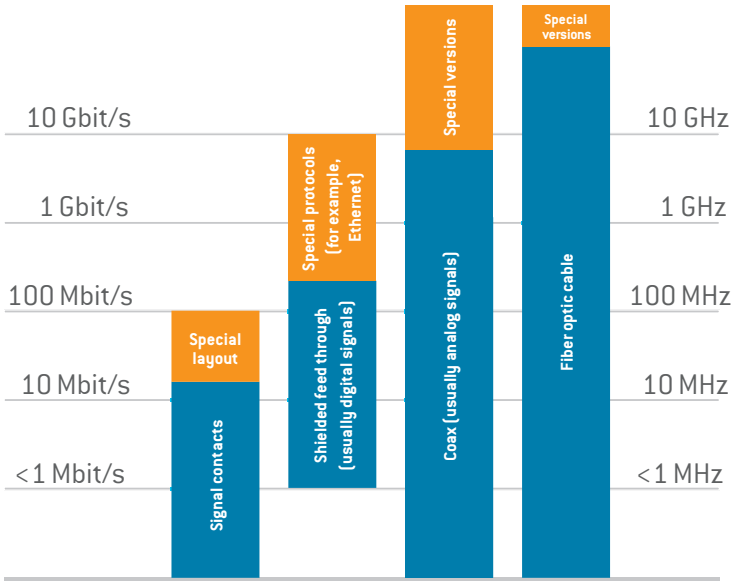
eSATA

Serial ATA was mainly developed for the data exchange between processor and hard disc. The further development of eSATA means that external devices can also be connected. Data transfer rates between **1.5 Gbit/s and 3.0 Gbit/s.**

Firewire

This is a serial high-speed connection technology for the PC periphery and is principally employed for video transmissions in real time. Data transfer rates between **400 Mbit/s and 3.2 Gbit/s.**

Transfer protocols and transfer rates



TYPICAL TRANSFER RATES:

Gbit-Ethernet	(1 Gbit/s – 10 Gbit/s)
HDMI	(8.16 Gbit/s)
USB 3.0 / Super Speed USB	(5 Gbit/s)
Firewire S3200	(3.2 Gbit/s)
eSata 2.0/1.5	(3.0 Gbit/s / 1.5 Gbit/s)
HD-Video	(2.4 Gbit/s)
Firewire S800	(800 Mbit/s)
USB 2.0	(480 Mbit/s)
Firewire S400	(400 Mbit/s)
Ethernet	(10 Mbit/s – 100 Mbit/s)
VDSL	(52 Mbit/s)
Profi-Bus	(12 Mbit/s)
USB 1.1	(12 Mbit/s)
RS 485	(10 Mbit/s)
FlexRay	(10 Mbit/s)
CAN-Bus	(1 Mbit/s)
RS232	(500 kbit/s)

REDEFINING STANDARDS

Standard connectors for common data transmission protocols are primarily designed for office environments. Harsh environment, such as dirt, moisture and countless pluggings are not taken in consideration into such standard designs. In order to respond to the higher demands, connectors are usually integrated into existing housings. This frequently leads to substantial compromises in size, weight, handling and costs.

BASIS


Firewire


Ethernet


HDMI


USB


eSata

COMMON MARKET DESIGN

ODU developed a cost effective high-speed generation of connectors.
The various designs are ideal for industrial applications and they optimally combine compactness, flexibility, mating cycles and the highest level of transmission reliability.

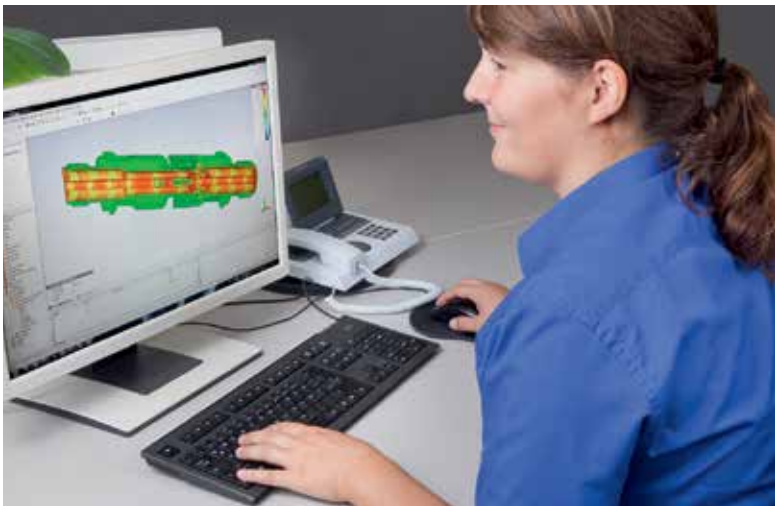
ODU SOLUTIONS

USB 2.0 and Gigabit-Ethernet combined

2 × 10 Gigabit-Ethernet combined with power

Fast-Ethernet for rail applications

KNOW-HOW IS THE FIRST STEP TO SUCCESS...



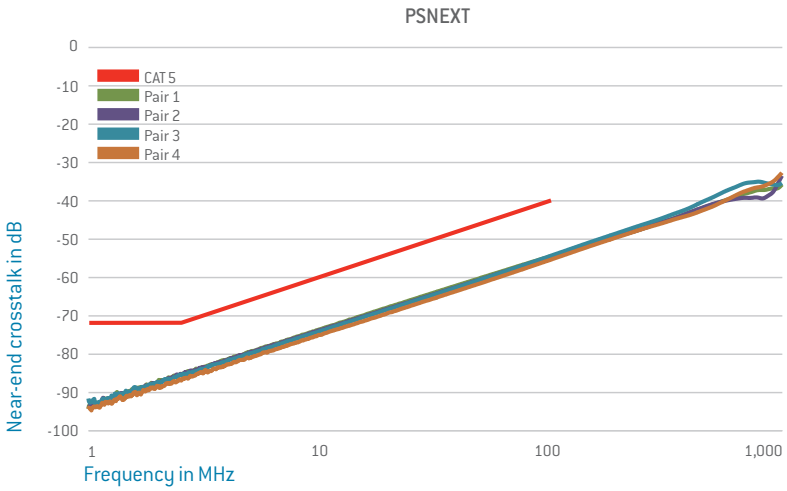
Specialist know-how and many years of experience turn a connector into an ODU high-speed connector; a process in which every detail counts.

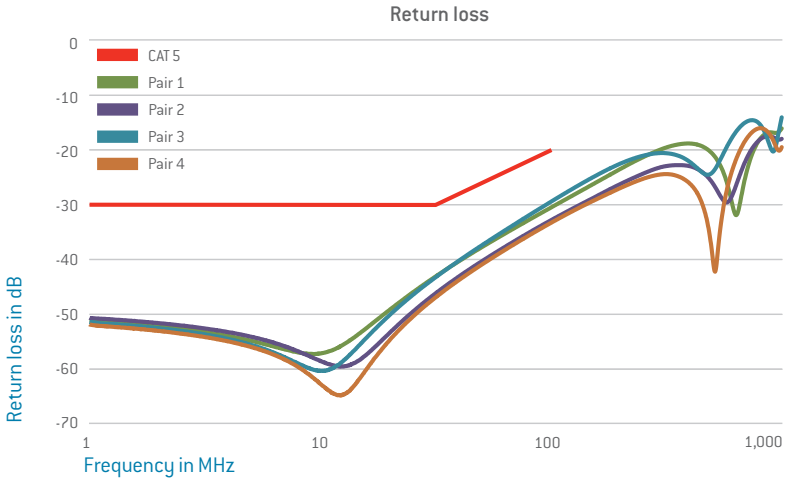
The selection of the insulation material requires special attention. The plastic must not only be matched to the demanding environmental conditions, but also to the sensitive high frequency parameters (for example, frequency-stable dielectric constant or low dissipation factor).

The special display and configuration of contacts produces a connector that enables data transfer rates of up to 10 Gbit/s. The optimization of the characteristic impedance and high return loss are key factors here. When creating the contact display ODU specialists use targeted field control to minimize crosstalk between the differential pairs.

This procedure means that CAT 6_A quality can be achieved without the need for a shielding plate.

... MAINTAINING ALL TECHNOLOGIES UNDER ONE ROOF IS THE SECOND.



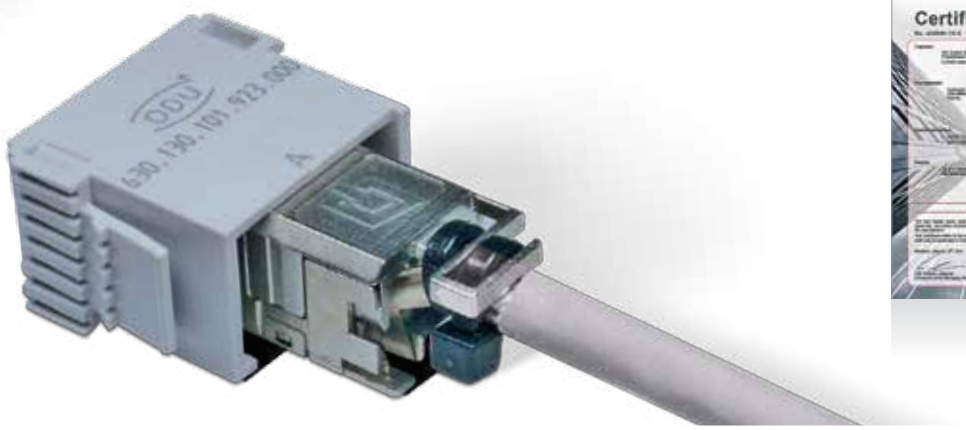


The use of simulation programs is a step towards further optimization as the expensive and tedious process of prototype construction can be dispensed with. It is possible to reach mass production status with the first prototypes in almost all the cases.

The transmission characteristics of a new connector version are measured using a vector network analyzer. Return loss, insertion loss, coupling attenuation and the delay as well as the near and far end crosstalk are compared with the required standards and constitute a firm element in the development process.

ODU delivers a wide range of high speed connectors that fulfill all the requirements for the transmission of high-speed protocols.
Our connector solutions can be used in a large variety of environmental conditions.

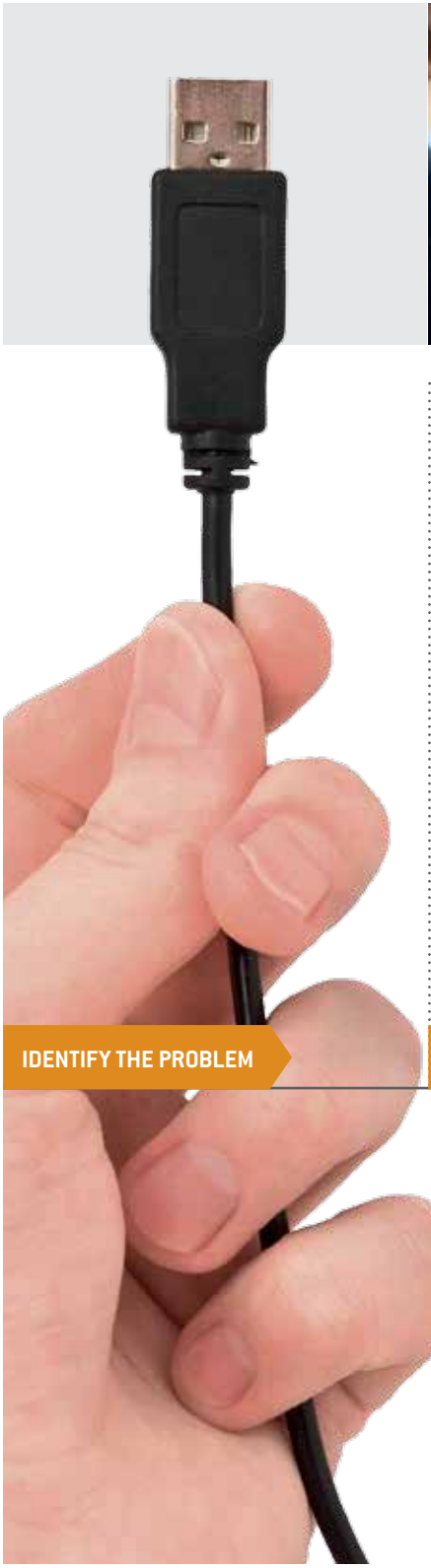
ODU high-speed connector attenuation levels lie considerably below the standard limiting values.



Certifications:

- IEC 11801:2010
- USB Specification Rev. 2.0:2000
- USB Specification Rev. 3.0:2011
- HDMI Specification Version 1.3a:2006
- IEEE 1394:2008

STEP BY STEP TO THE PERFECT CONNECTOR



IDENTIFY THE PROBLEM

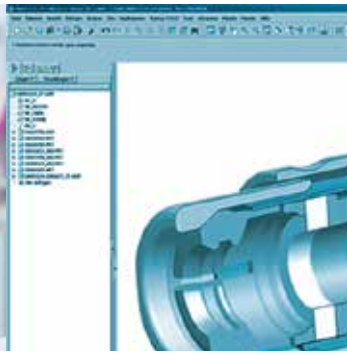
TALK WITH THE CUSTOMER

Clarify the requirements:

- Required protocol
- Mechanical requirements (pressure, mating cycles, vibration stability, etc.)
- Application area
- Cable
- Device connection

STANDARD ALIGNMENT

In most cases the specifications from the standards are known. But if, for example, two data protocols have to be combined in one connector, further research is needed into the applicable standards and the limits for such factors as the S-parameters, crosstalk and shielding attenuation.



DESIGN

Customized solution to the required environmental conditions (high number of mating cycles, water resistance, temperature, vibration resistance, pressure tightness).

In the RF simulation, data transmission designs are reviewed in a time efficient manner:

- Review of the characteristic impedance
- Insertion of compensation regions
- Calculation of the S-parameters
- EMC simulation

RF SIMULATION

Check of the stipulated limiting values:

- S-parameters and crosstalk
- Characteristic impedance using Time Domain Reflectrometry (TDR)
- Transfer impedance and coupling attenuation

RF MEASUREMENT

Upon customer request, an external test laboratory can carry out a certification process as long as the applicable standards do not impose any restrictions.

CERTIFICATION

The finished solution fulfills all data transmission parameters and additionally possesses all the specific characteristics required.

SYSTEM SOLUTION

TARGET MARKETS FOR POWERFUL CONNECTORS

ODU's connector solutions stand for high quality, reliability and flexibility. Customers from a wide range of sectors have good reason to rely on them.

Medical

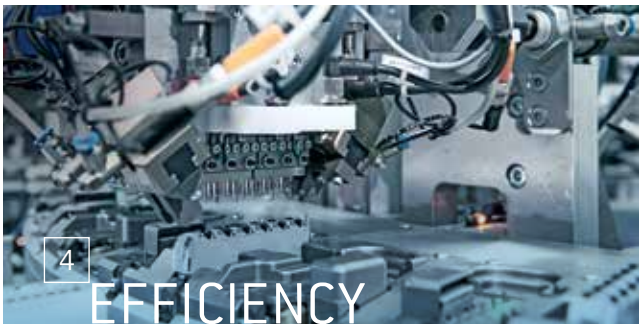
Reliability and the highest level of failure protection are indispensable to life in medical applications. ODU has the right connections that stand up to even medical technology's strict specifications.

Measurement and testing

Premium measuring instruments and procedures demand precision. And this is exactly what ODU's powerful connectors offer.

Military and security

ODU's military connector solutions provide high reliability even in harsh environments.



Industrial

Precise and failsafe control engineering is crucial in order for machines and systems to ensure a high level of functional capability and availability. Efficient products from ODU create secure connections and satisfy the widest range of requirements.

Energy

Constant availability of power is one of the central components of our modern world. ODU offers highly flexible solutions to ensure that forward-looking infrastructure projects can be implemented.

Automotive

Here ODU is making a valuable contribution in the form of extremely powerful connector systems: Our innovative contact technology satisfies many requirements, such as vibration and media resistance and the lowest possible weight.

SOLUTIONS FOR CHALLENGING APPLICATIONS

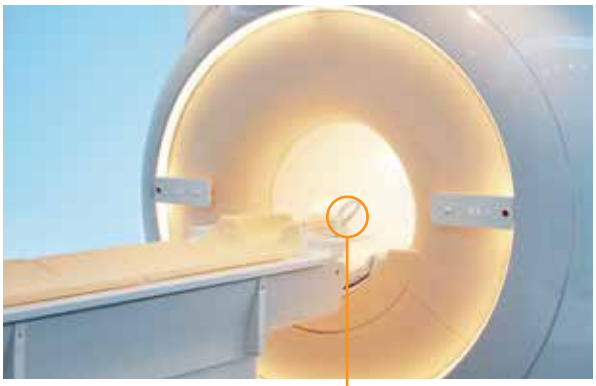
Military applications

Highly reliable solutions for the next-generation military systems that require an extensive use in harsh environments.

Photo: ROHDE & SCHWARZ

Interface for modern office communication

The multi-function pillar is a flexible energy and data connection system designed for the fast organization of office workplaces.
Category CAT 6_A, to 10 Gbit/s.



Medical applications

Diagnosis data are transmitted and evaluated online in medical technology. ODU connectors ensure reliable connections.

Test & measurement applications

CSP 2008 universal controller (Fig. at the left) and CSP 2008 RS422 expansion terminal from MICRO-EPSILON (Fig. at the right).

Industrial applications

A small, pressure-tight connection transmits the data rates according to FireWire 800 with power contacts in a shock-proof and vibration-proof design.

UNCOMPROMISING QUALITY

ODU-MAC®

What characterizes the modular rectangular connectors from ODU?

- High number of mating cycles
- High contact reliability
- Unlimited flexibility

ODU contacts with springwire technology enable up to 100,000 mating cycles and depending on the environmental conditions, up to one million. High mating cycles are not just a key factor in testing, but also in medical technology, MRI application- average number of 100,000 mating cycles in ten years.

Characteristics

- Signal, power, high current, fiber optic, pneumatic, fluid and BUS modules
- Very high mating cycles (> 100,000)
- Vibration protection
- Automatic docking and manual mating
- High packing density

Modularity

The flexible combination of modules for the transmission of data, power, signals, high frequency, light and compressed air frequently enable many individual connectors to be combined in one connector solution.

ODU-MAC® – MODULAR RECTANGULAR CONNECTORS

Various housing versions are available with side and straight cable outlet, EMC protection and spindle and lever locking.

Various contact inserts are also available for signals, power transmission and radio frequency.

Frame sizes can be selected freely (approx. 7.6 mm to 150 mm).
DIN housing for 10 to 34 units.
Aluminum frame for 3 to 60 units or more – based on the customer's request.

Ethernet connector

- Shielded feed through
- 4 contact positions for 100 Mbit-Ethernet
- Mating cycles: 5,000/60,000

10 Gbit-Ethernet connector

- Shielded feed through
- 8 contact positions for 10 Gbit-Ethernet
- 5,000 mating cycles

THE COST-EFFECTIVE INTERFACE SOLUTION

ODU MAC LC

Flexible and robust modular rectangular connectors

The ODU MAC LC product series include cost effective and highly reliable connector solutions.

Characteristics

- Simple packaging of the crimp contacts and modules, also independently of the frame
- Disassembly of the contacts from the insertion side
- Locking in place and dismantling of the modules in the zinc pressure cast frame without tools
- Earth termination with commercially available cable lugs and earth connection via guide system
- Up to 5,000 mating cycles
- High contact density: up to 370 contacts in one housing

ODU MAC LC – MODULAR RECTANGULAR CONNECTORS

Various housing models available with spindle and lever locking.

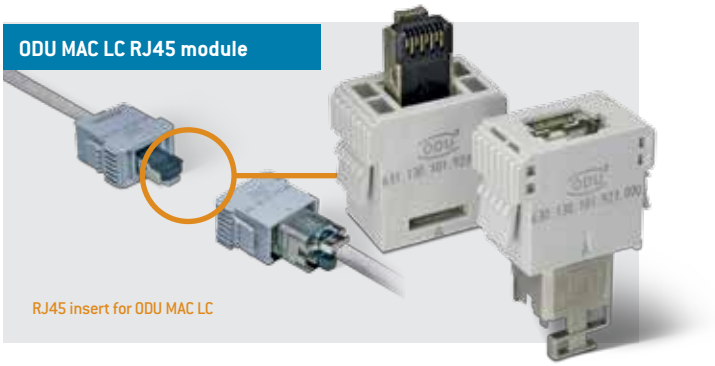
Various contact inserts for signals, power transmission and radio frequency.

4 frame sizes:
12, 18, 26 and 37 units
(approx. 51 mm to 111 mm).

ODU MAC LC USB module

- As a service interface without pin part

ODU MAC LC RJ45 module



- Certified for up to 10 Gbit-Ethernet CAT 6_A
- Backward compatible
- Can be contacted via a Standard-Ethernet connector

ALWAYS A GOOD CONNECTION

ODU MINI-SNAP®

Advantages of a Push-Pull locking system

- Quick and easy connect and lock
- Quick and easy unmating
- Blind insertion and separation are easy, even in hard-to-access locations
- Low space requirements for devices
- Clear, secure locking states
- Low force required
- Ideal for robotic applications
- Versatile coding possibilities

Diversity on call

- Push-Pull connectors made of metal
- 4 series: L, K, B, and F with 6 sizes: 1 to 40 contact positions, mixed insert arrangement; outer diameter 6.5 mm to 25 mm
- More than 300 catalog inserts
- Certified to UL, MIL and VDE
- Solder, crimp, and print termination
- 5,000 mating cycles
- IP 50 and IP 68
- Application-specific adjustment possible

CIRCULAR CONNECTORS WITH PUSH-PULL LOCKING

Series L

- Coding via pin and groove
- LP locking principle with locking fingers
- Protection degree: IP 50

Series K

- Coding via pin and groove
- LP locking principle with locking fingers
- Protection degree: IP 68

Series B

- Coding via pin and groove
- FP locking principle using conical sleeve
- Protection degree: IP 68
- Sealed with small outer diameter

Series F

- Coding using half-shells
- FP locking principle using conical sleeve
- Protection degree: IP 50 and IP 68

Receptacle with strain relief for series K, size 3

- 18 contact position for 100 Mbit-Ethernet with special signals
- 14 × 0.7 mm contacts for signal transmission
- 4 × 0.7 mm contacts in a shielded insert, 100 Mbit-Ethernet

RELIABLE CONNECTOR SOLUTIONS

ODU AMC®

Connector solutions for military applications

Fast and reliable data transfer is a must for the military and security technology.

The various designs of the ODU AMC connector series satisfy these requirements: In addition to the USB 2.0 version and the Ethernet designs with transfer rates of 100 Mbit to 10 Gbit, ODU also offers a connector that combines USB 2.0 and Ethernet transfer.

The connection systems in the ODU AMC series are smaller and lighter than the known MIL housings with RJ45 inserts. They are also extremely robust, versatile and very easy to handle. ODU AMC connectors are used in various soldier modernisation programmes. The individual ODU AMC versions are available in Push-Pull or Break-Away models and can be adapted to a wide range of applications.

Characteristics

- Push-Pull or Break-Away function
- Light, small and simple to operate
- Operating temperature from -51° C to +125° C
- Optimized mechanical coding
- Colour coding
- Easy-Clean version available
- Rugged and reliable
- System solution including cable assembly and overmolding
- Ready for use even under the most difficult environmental conditions
- Blind insertion
- Excellent shield properties (360°)
- Watertight (IP 68)
- More than 5,000 mating cycles

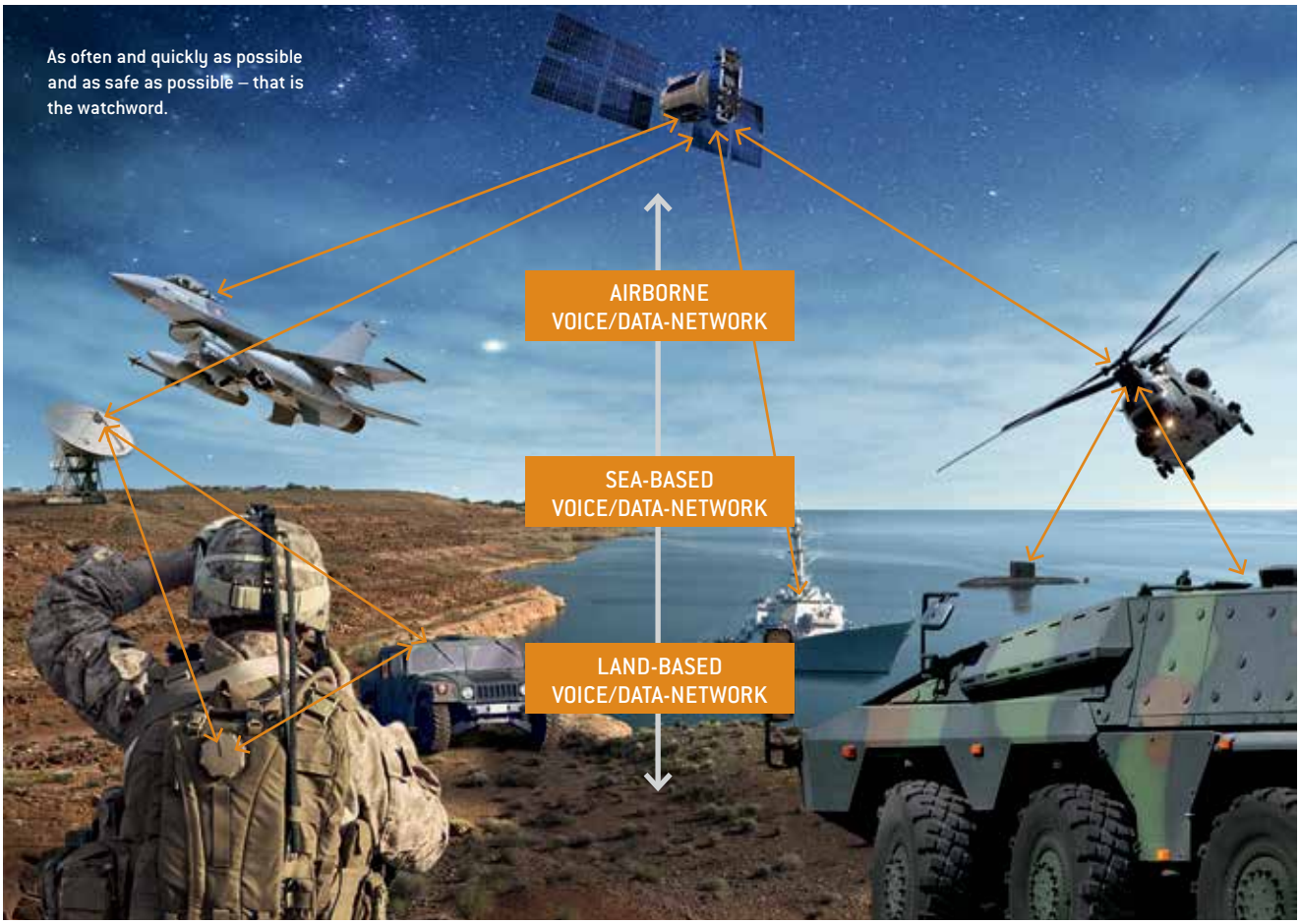
ODU AMC® – ADVANCED MILITARY CONNECTORS

Push-Pull

Break-Away

Easy-Clean

High-Density



POWER AND RELIABILITY

RUGGED HIGH-SPEED CONNECTORS

Rain, wind, water, snow or frost

The robust circular connectors easily stand up to the toughest environmental conditions. Whether in use on container cranes or in melting furnaces, the solid housings have been designed for the most adverse circumstances.

The proven ODU SPRINGTAC contacts with springwire technology can be used to transfer signals all the way up to the high current range. They ensure a reliable and trouble-free connection even when used in vibrating environments.

Characteristics

- Transmission rates from 100 Mbit/s (Fast-Ethernet) to 1 Gbit/s (Gigabit-Ethernet)
- More than 50,000 mating cycles in the standard version. Quick-change heads can increase the number of mating cycles as needed
- Low weight thanks to aluminum housing
- 360° EMC protection
- 100 % functional reliability under even the most difficult environmental conditions, such as dust and dirt
- Vibration resistance thanks to the proven ODU contact technology (ODU SPRINGTAC)
- Temperature resistance
- Easy assembly

RUGGED HIGH-SPEED CONNECTORS

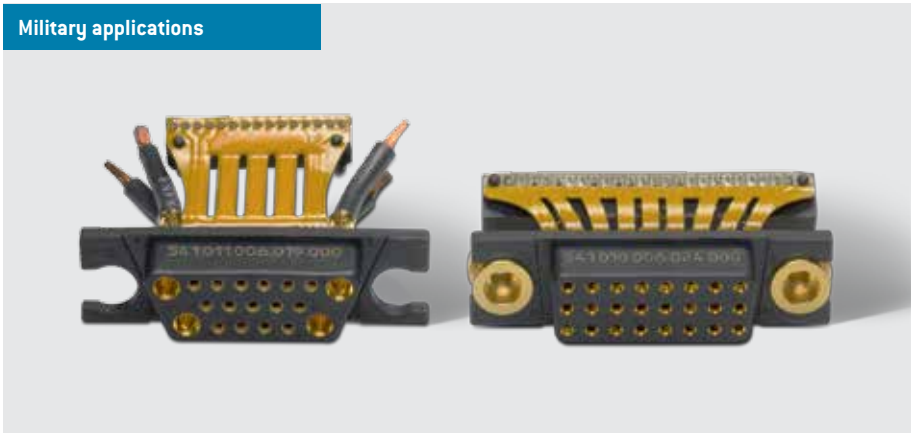
ODU DOCK connector with MAC adaptor:

- 4 contact positions for 100 Mbit-Ethernet
- Solder and crimp version
- Available in various sizes
- Different inserts available for up to 10 Gbit-Ethernet

Railway coupling applications:

- Data rates up to 1 Gbit-Ethernet
- Aluminum housing with quick change head for the highest number mating cycles
- 360° shielding

Military applications



- LVDS signal
- Compact design
- System supplier

INDIVIDUAL CABLE ASSEMBLY

Reliable connector and cable assembly solution provider

Insufficient experience in assembling connectors and cables can result in an end product with impaired system function. This is a problem that many assemblers face due to a lack of connector experience. ODU has over 70 years of experience in developing connectors that stand for the highest quality on the market and also sound experience in cable assembly.

We therefore offer our customers pre-assembled component solutions. Our high levels of expertise in development and manufacturing teamed with the most modern manufacturing facilities in Europe, China and the USA allow us to offer our customers tested assemblies both locally and globally in combination with logistics services. We can assemble connectors for high signal transfer rates according to customer specifications based on well-founded test results from our own electromechanical laboratory. Naturally also with the corresponding test certificates! Thanks to our excellent supplier management system, we guarantee quick and precise delivery with consistently high quality from the low to high volume projects within the group.

WE OFFER DIVERSE PRODUCT TECHNOLOGIES

- Freely assembled connectors
- Assembly with heat shrink parts
- Extruded assembly
- Solder and crimp technology with accompanying check
- Combined solutions

VALUE ADDED SERVICES

- 100% final inspection
- Production possible in cleanroom in accordance with EN ISO 14644-1
- Extrusion in vacuum procedure
- Extrusion in high pressure-temperature procedure
- EMC-compatible assembly
- Customer-specific labelling
- Production possible in accordance with UL (File: E333666)

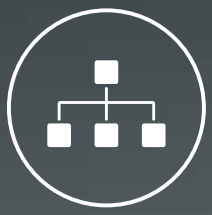
PERFECT INTERACTION

Everyone talks about functioning assemblies – we make them!

As manufacturers of a diverse range of high-end contacts, circular and rectangular connectors and also customer- and application-specific connectors, absolute quality and reliability are core values in our corporate and product philosophy. Our cable assembly department continuously improves our product technology and testing methods to ensure high quality results. The result is always perfect interaction between cable and connector.

We offer cost effective versatile modular connector solutions that can transfer data, power, signal, high frequency, light and compressed air.

ODU FULFILLS ALL COMMON SYSTEM REQUIREMENTS



Ethernet
10 Mbit/s to 10 Gbit/s

USB 2.0

USB 3.0

Firewire

HDMI

eSATA

100, 1,000 OR 10,000 MBIT?

Our high-speed connectors meet all the requirements for use with common Industrial Ethernet protocols.

Whether EtherCAT or Profinet – with ODU connectors you will never run into speed limits.

100 MBIT-ETHERNET CONNECTORS

Backward compatible with 10 Mbit-Ethernet

Fast-Ethernet

Tested in accordance with IEC 11801:2010 CAT 5 connectors (comparable to EN 50173 and IEC 61935).

S-parameters @ 100 MHz

Return Loss	< -30 dB
Insertion Loss	> -0.10 dB
NEXT	< -48 dB
FEXT	< -50 dB
Delay	< 1.25 ns

Modules/inserts Sizes 0 + 1 + 2

Cable options

- Cable diameter
  - Size 0: max. 4.2 mm
  - Size 1: max. 6.2 mm
  - Size 2: max. 9.9 mm
- Categories: CAT5, CAT6, CAT6$_A$, CAT7, CAT7$_A$
- Design: UTP, S/UTP, S/STP, SF/FTP
- Wires: 4

Mating cycles

- ODU MINI-SNAP: 5,000
- ODU AMC: 5,000
- ODU-MAC: 5,000 / 60,000 / 100,000
- ODU MAC LC: 5,000
- Rugged Connectors: 50,000

Other protocols

Can also be used for all common Industrial Ethernet protocols, such as Varan, Ethernet/IP, EtherCAT, Powerlink, Sercos, Profinet

Design options

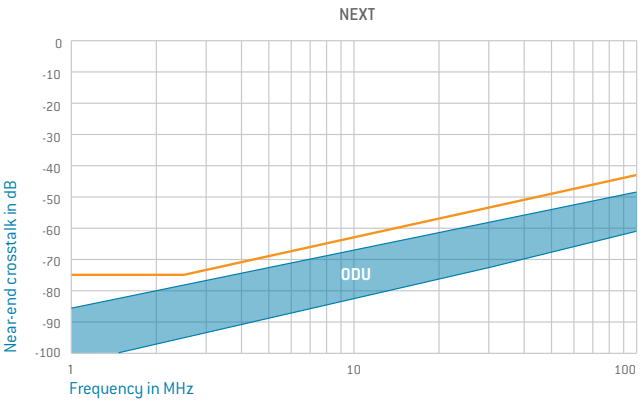
Crimp contact, solder contact and print contact

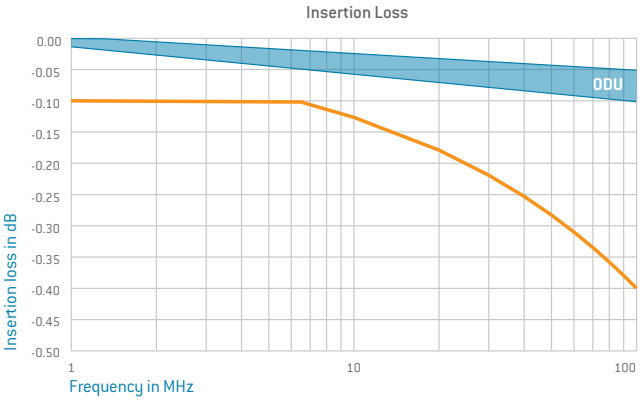
Certification

IEC 11801 – CAT 5 Component
RoHS 2002/95/EC

Product series

ODU AMC, ODU MINI-SNAP (L, K, B), ODU-MAC, ODU MAC LC and Rugged Connectors





1 GBIT-ETHERNET CONNECTORS

Backward compatible with 100 Mbit-Ethernet

Gigabit-Ethernet

Tested in accordance with IEC 11801:2010 CAT 5 connectors (comparable to EN 50173 and IEC 61935).

S-parameters @ 100 MHz

Return Loss	< -30 dB
Insertion Loss	> -0.15 dB
NEXT	< -50 dB
FEXT	< -55 dB
Delay	< 1.25 ns

Modules/inserts Sizes 1 + 1,5 + 2

Cable options

- Cable diameter
  - Size 1: max. 4.2 mm
  - Size 1.5: max. 8.0 mm (only AMC)
  - Size 2: max. 9.9 mm
- Categories: CAT5, CAT6, CAT6$_A$, CAT7, CAT7$_A$
- Design: S/UTP, S/STP, SF/FTP
- Wires: 8

Mating cycles

- ODU MINI-SNAP: 5,000
- ODU AMC: 5,000
- ODU-MAC: 5,000 / 60,000 / 100,000
- ODU MAC LC: 5,000
- Rugged Connectors: 50,000

Other protocols

Can also be used for all common Gigabit-Ethernetcapable Industrial Ethernet protocols, such as EtherCAT

Design options

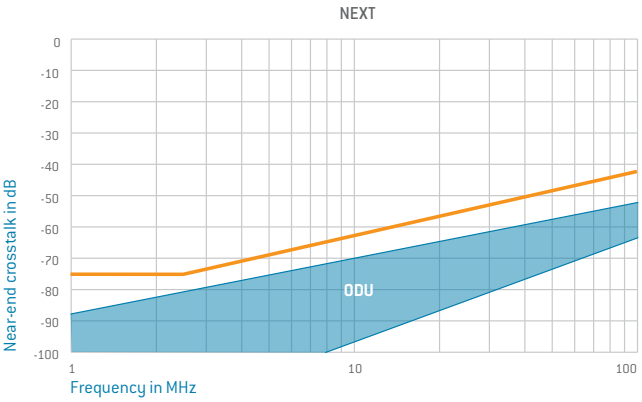
Crimp contact, solder contact and print contact

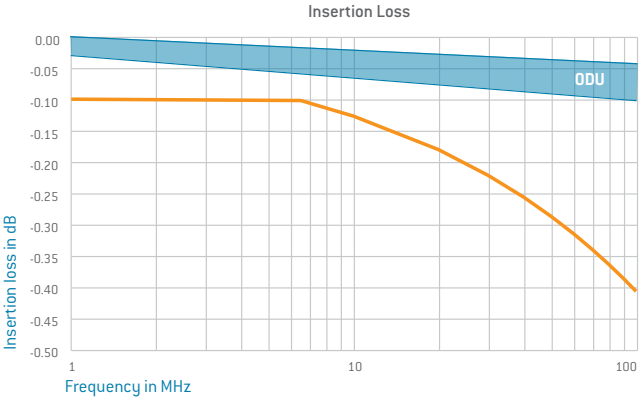
Certification

RoHS 2002/95/EC
IEC 11801-CAT5 Component

Product series

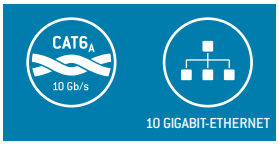
ODU AMC, ODU MINI-SNAP (L, K, B), ODU-MAC, ODU MAC LC and Rugged Connectors





10 GBIT-ETHERNET CONNECTORS

Backward compatible with 1 Gbit-Ethernet



Tested in accordance with IEC 11801:2010 CAT6$_A$ connectors (comparable to EN 50173).

S-parameters @ 600 MHz

Return Loss	< -20 dB
Insertion Loss	> -0.40 dB
NEXT	< -40 dB
FEXT	< -45 dB
Delay	< 1.25 ns

Modules/inserts Sizes 2

Cable options

- Cable diameter
  Size 2 — max. 9.9 mm
- Categories — CAT6$_A$, CAT7, CAT7$_A$
- Design — S/UTP, S/STP, SF/FTP
- Wires — 8

Mating cycles

- ODU MINI-SNAP — 5,000
- ODU AMC — 5,000
- ODU-MAC — 5,000
- ODU MAC LC — 5,000

Design options

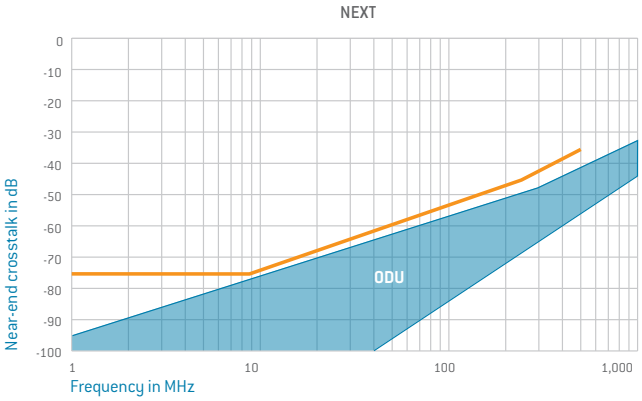
Crimp contact, solder contact and print contact

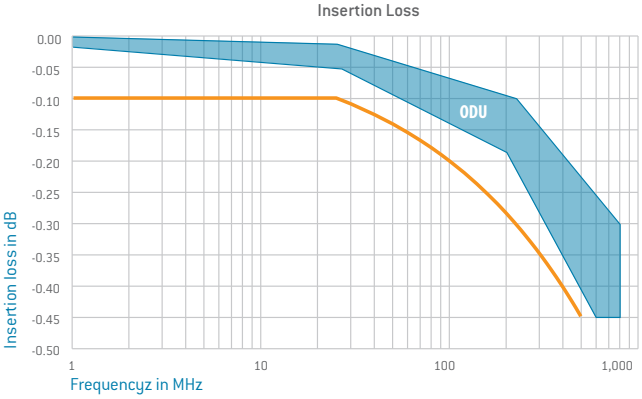
Certification

RoHS 2002/95/EC

Product series

ODU AMC, ODU MINI-SNAP (L, K, B), ODU-MAC and ODU MAC LC





USB 2.0 CONNECTORS

Backward compatible with USB 1.0

Tested in accordance with Universal Serial Bus Specification Rev. 2.0:2000 (including 4 m cable).

S-parameters @ 400 MHz

Return Loss	< -10 dB
Insertion Loss	> -5.00 dB
Delay	< 20 ns
Impedance	90 Ω ± 15 Ω

Modules/inserts Sizes 00 + 0

Cable options

- Cable diameter

Size 00	max. 3.5 mm
Size 0	max. 4.2 mm

- Wires: $2_{HS} + 2_{Power}$ (4)

Mating cycles

- ODU MINI-SNAP: 5,000
- ODU AMC: 5,000
- ODU-MAC: 5,000 / 100,000
- ODU MAC LC: 5,000

Design options

Crimp contact and print contact

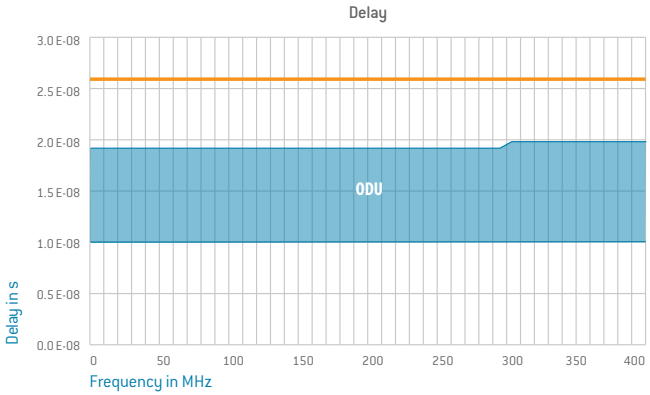
Certification*

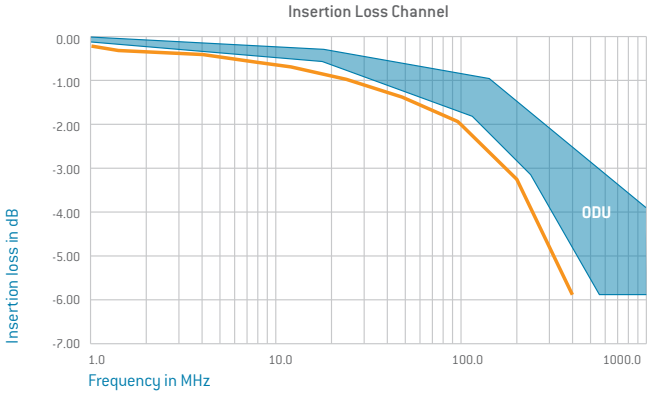
RoHS 2002/95/EC

Product series

ODU AMC, ODU MINI-SNAP (L, K, B), ODU-MAC and ODU MAC LC

* USB certification is not possible because the exact compliance with the standard USB plug size is required in order to pass the compliance test. All data transmission specifications for USB connections are satisfied.





USB 3.0 CONNECTORS

Backward compatible with USB 2.0 & USB 1.0

Tested in accordance with Universal Serial Bus Specification Rev. 3.0:2011 (including 3 m cable & 2x USB 3.0 type A connector).

S-parameters @ 7,500 MHz

Insertion Loss	> -25 dB
NEXT	< -23 dB
Impedance	90 Ω ± 15 Ω

Modules/inserts Sizes 0

Cable options

- Cable diameter
  Size 0 max. 6.6 mm
- Wires $2 \times 2_{SS} + 2_{HS} + 2_{Power}$

Mating cycles

- ODU AMC High-Density 5,000
- ODU-MAC 5,000

Design options

Crimp contact and print contact

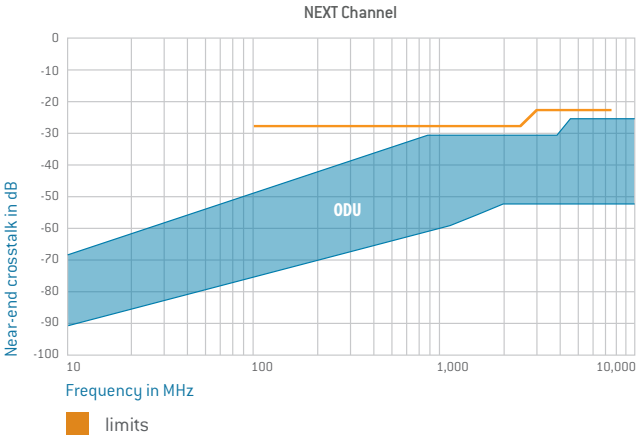
Certification*

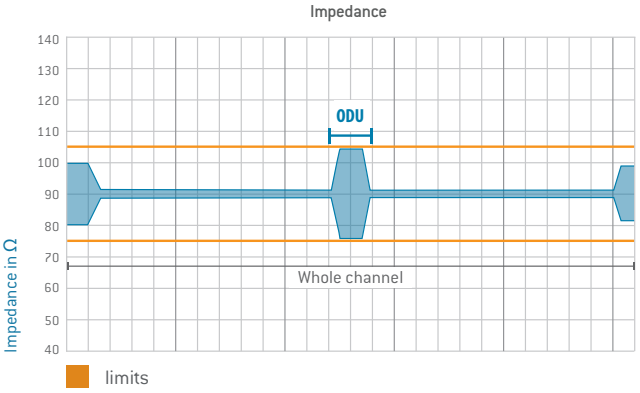
RoHS 2002/95/EC

Product series

ODU AMC High-Density and ODU-MAC

* USB certification is not possible because the exact compliance with the standard USB plug size is required in order to pass the compliance test. All data transmission specifications for USB connections are satisfied.





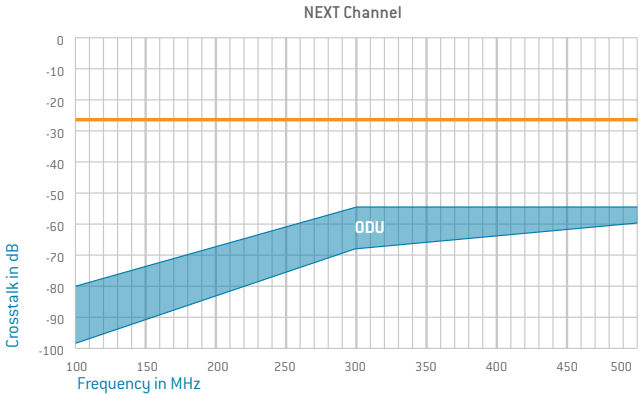
FIREWIRE S400 CONNECTORS

Firewire

Tested in accordance with IEEE1394:1995 (including 4.5 m cable).

S-parameters @ 400 MHz

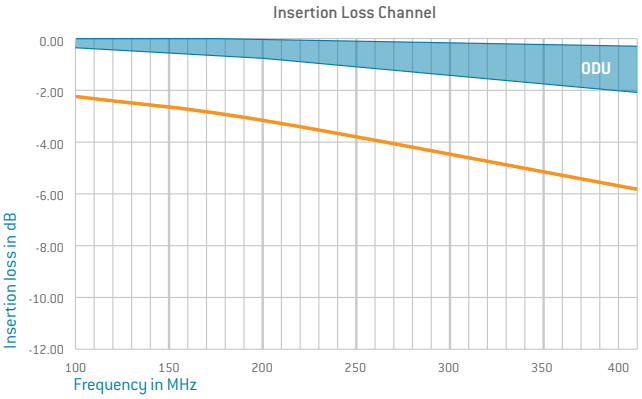
NEXT	< -55 dB
Insertion Loss	> -2 dB
Impedance	110 Ω ± 6 Ω



Modules/inserts Sizes 0

Cable options

- Cable diameter
  Size 0 max. 4.2 mm
- Wires 4



Mating cycles

- ODU MINI-SNAP 5,000
- ODU AMC 5,000
- ODU-MAC 5,000 / 100,000
- ODU MAC LC 5,000

Design options

Crimp contact and print contact

Certification

RoHS 2002/95/EC

Product series

ODU AMC, ODU MINI-SNAP (L, K, B), ODU-MAC and ODU MAC LC

HDMI 1.3 CONNECTORS

Tested in accordance with High-Definition Multimedia Interface Specification Rev. 1.3a:2006 (including 3 m cable).

S-parameters @ 4,125 MHz

Insertion Loss	> -30 dB
NEXT	< -20 dB
Impedance	100 Ω ± 15 Ω

Modules/inserts Sizes 2

Cable options

- Cable diameter
  Size 2 — max. 9.9 mm
- Wires — 4 x 2 + 7 (15)

Mating cycles

- ODU MINI-SNAP — 5,000
- ODU AMC — 5,000
- ODU-MAC — 5,000

Design options

Crimp contact and print contact

Certification

RoHS 2002/95/EC

Product series

ODU AMC, ODU MINI-SNAP (L, K, B), ODU-MAC and ODU MAC LC