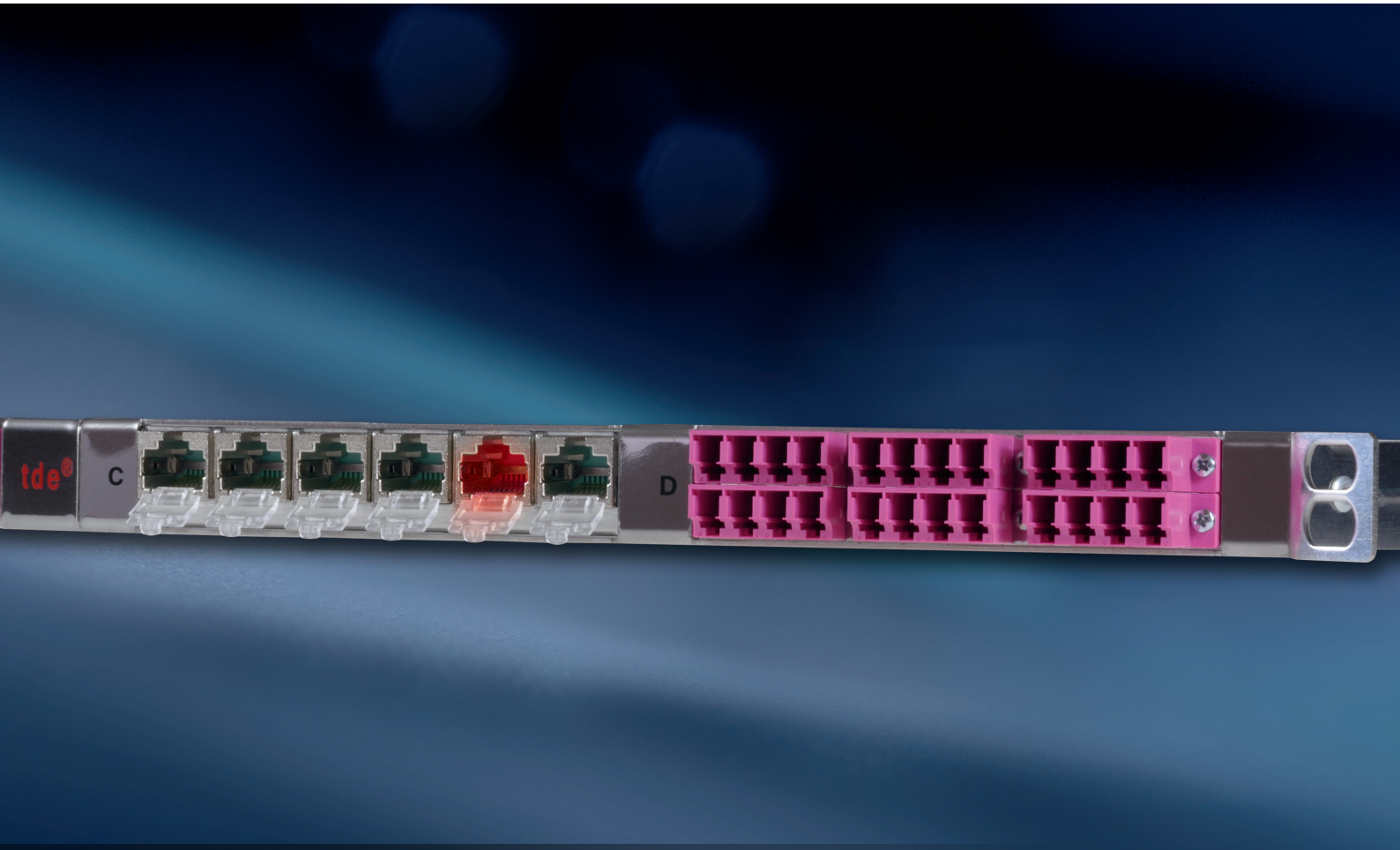
tde®
trans data elektronik GmbH

net.work.solution. made in Germany

ISO 9001
TL 9000
ISO 14001

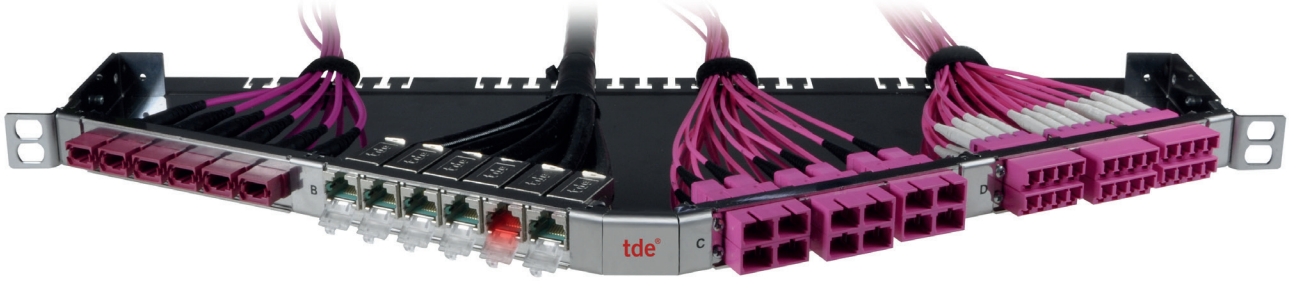


tSML tde Semi Modular Link System

Reduced to the maximum

MADE IN GERMANY
tde®
Since 25 Years

tde®
trans data elektronik GmbH



tSML tde Semi Modular Link System

The number of network connections in a Data Center is increasing constantly, due to the ever greater demands made on technology and capacity. A very high packing density and cabling with versatile potential for expansion are fundamental requirements of both server connections and pure storage area networks.

Standard cabling entails a high outlay for any modification to the network infrastructure, as whole sections of the existing cabling frequently have to be replaced and tested. The tSML – tde Semi Modular Link System starts where traditional systems stop.

The system components, ready-fitted with connectors and tested ex works, facilitate very fast installation of both twisted pair and fiber-optic cables. Ready-made trunk cables, providing a high number of pairs or fibers, can simply be plugged together using patch panels.

At the heart of the tSML – tde Semi Modular Link Systems are MPO and Telco connectors, with which 12 or 24 optical fibers copper pairs can be connected simultaneously. Fiber-optic and twisted pair modules can be combined on one rack unit without difficulty.

This also achieves a high level of investment security whilst doing something for the environment at the same time, as individual components can be replaced and reused when the network is modified, making a contribution to green IT.

Highly compact

Telco for 6x RJ45 GbE TP Links

tML® Systemcable (right) by comparison to the standard

MPO for 6x FO duplex links 10GbE or 1x 40/100 GbE

Produktmerkmale

> Maximum packing density
> Twisted pair and fiber-optic modules can be combined on 1U
> FO/TP Breakout Panel with Snap-In
> Quick and simple „plug and play“ installation
> Up to 1152 fibers on 0.5U (2304 fibers on 1U)
> Modules with LC, MPO or SC
> MPO with 12 or 24 fibers
> Available in OS2, OM3 and OM4 configurations
> OS2/OM3/OM4 with bend optimised fibers
> 48x LC Duplex Ports on 0.5U (96 fibers)
> 24x RJ45 Ports GbE or 10GbE on 0.5U shielded
> RJ45 optional with LID (Light ID) function
> Stable, shielded Telco connectors
> Energy-efficient
> System component reusability ensures environmental friendliness
> Migration on 40/100GbE possible
> „Made in Germany“

Technical Data

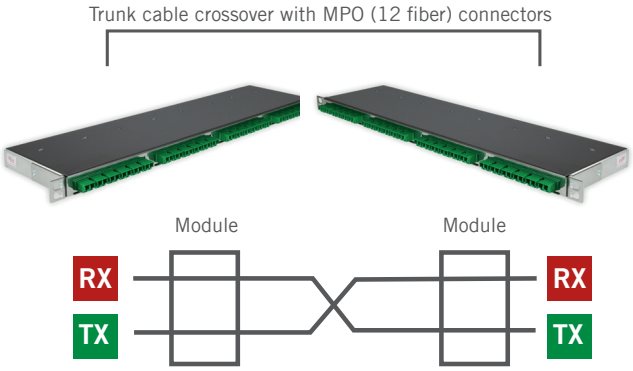
FO Connector Performance					
			insertion loss (dB)		return loss (dB)
Fiber	**Type**	**Wavelength**	**typical**	**max**	**min**
50/125µ OM3	**LC**	**850nm**	**≤ 0,20**	**0,35**	**30**
	MPO	850nm	≤ 0,20	0,35	25
50/125µ OM4	**LC**	**850nm**	**≤ 0,10**	**0,30**	**35**
	MPO	850nm	≤ 0,16	0,30	30
9/125µ	**LC**	**1550nm**	**≤ 0,10**	**0,25**	**55**
	LC APC	1550nm	≤ 0,10	0,25	75
	MPO APC	1550nm	≤ 0,10	0,25	75

All modules are tested
before delivery **(Plug & Play)**.

For all fiber optic connectors following applies:

- **> FO connector geometry according to IEC and better**
- **> 100% inspection of all MPO/MTP and SM connectors using interferometers**
- **> MPO/MTP plug has a defined fiber height of 1 - 3,5µ**
- **> Max. adjacent fiber height difference is 0,2µm and for all fibers 0,3µm**

tSML FO cabling plan



TIA/EIA-568-B.1 Method C
Method A and B on customer request

A crossover of both optical fibers is required for transmission between the transmitting and receiving diodes in any fiber-optic cabling system.

This is accomplished in a trunk cable in the tSML-system. A typical configuration therefore consists of an crossover MPO/MPO trunk cable and two standard modules.

tSML TP Link Performance

GHMT®

Certificate

No. z2577o-11-E

Customer:
tde – trans data elektronik GmbH
Im Defdahl 233
44141 Dortmund, Germany

Category 6A

Test sample(s):
Connector:
tBL RJ45 jack cat.6A ISO/IEC
Part-No.: TBL-RJ45KS
TBL-RJ45KSL
TBL-RJ45DC
TBL-RJ45DCL

Applied standard(s):
ISO/IEC 11801 Ed.2.2 (2011-06)
IEC 60603-7-51 Ed.1.0 (2010-03)

Results:
The sample meets the limits of the specified standards and regulations with respect to the parameters indicated above.

Connector, Category 6A

The test results which were determined in the course of the measurement refer to the submitted specimen. Any future technical modifications of the verified products are subject to the responsibility of the manufacturer.

This Certificate refers to the comprehensive test report no. P2577o-11-E and shall only be applicable in conjunction with the test report.

Bexbach, 09. August 2013

Dirk Wilhelm, engineer
(Chairman of the Managing Board)

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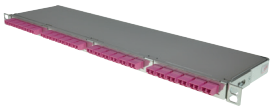
HOCHVERFÜGBARKEIT IM GANZEN
BEDINGT PRÄZISION IM DETAIL.

tSML FO Modules 19“/0.5U

4x MPO on 24x LC Duplex



Fiber	Part Number
9/125µ	**TSML-M24LCADK/MPP09E**
9/125µ	**TSML-M24LCDK/MPP09E**
50/125µ OM3	**TSML-M24LCDK/MPP50G3**
50/125µ OM4	**TSML-M24LCDK/MPP50G4**

4x MPO on 24x LC Duplex (angled)

Fiber	Part Number
9/125µ	**TSML-MS24LCAD/MPP09E**
9/125µ	**TSML-MS24LCD/MPP09E**
50/125µ OM3	**TSML-MS24LCD/MPP50G3**
50/125µ OM4	**TSML-MS24LCD/MPP50G4**

tSML HD FO Modules 19“/0.5U

8x MPO on 48x LC Duplex

Fiber	Part Number
9/125µ	**TSML-M48LCAD/MPP09E** [1]
9/125µ	**TSML-M48LCD/MPP09E** [1]
50/125µ OM3	**TSML-M48LCD/MPP50G3** [1]
50/125µ OM4	**TSML-M48LCD/MPP50G4** [1]

8x MPO on 48x LC Duplex (angled)

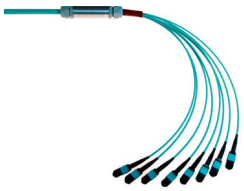
Fiber	Part Number
9/125µ	**TSML-MS48LCAD/MPP09E** [1]
9/125µ	**TSML-MS48LCD/MPP09E** [1]
50/125µ OM3	**TSML-MS48LCD/MPP50G3** [1]
50/125µ OM4	**TSML-MS48LCD/MPP50G4** [1]

tSML FO Trunk Cable MPO/MTP®

Patch cord (3mm)

Fiber	Part Number
50/125µ OM3	**TSMLMP/MP50I12G3-xxx** [2]
50/125µ OM4	**TSMLMP/MP50I12G4-xxx** [2]
9/125µ	**TSML-MP/MP09I12Exxx** [2]

Universal Cable



Fiber	Part Number
50/125µ OM3	**TSMLMP/MP50B yy** [3] **G3- xxx** [2]
50/125µ OM4	**TSMLMP/MP50B yy** [3] **G4- xxx** [2]
9/125µ	**TSMLMP/MP09B yy** [3] **E xxx** [2]

tSML FO/TP Breakout Modules 19“/0.5U

for 4x TP Trunks 10GbE or 4x FO partial front panels

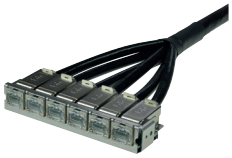
Description	Part Number
Stainless steel	**TSML-M-19/0.5HE-KB**

for 4x TP Trunks 10GbE or 4x FO partial front panels (angled)

Description	Part Number
Stainless steel	**TSML-MS-19/0.5HE-KB**

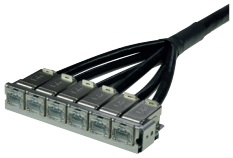
tSML TP RJ45 10GbE solution

TP Trunk Cable Snap-In both ends 6x RJ45



Description	Part Number
both ends connected	**TSML-MS06RJ45-xx** [4]
one end connected	**TSML-MS06RJ45-xx** [4] **U**

TP Trunk Cable Snap-In both ends 6x RJ45 with LID function



Description	Part Number
both ends connected	**TSML-MS06RJ45-xx** [4] **L**
one end connected	**TSML-MS06RJ45-xx** [4] **LU**

Detector for TP Trunk Cable with LID function

Description	Part Number
incl. battery	**TBL-LID-TOOL**

SSTP Patch cord RJ45/RJ45 TM31 Cat.6A

Description	Part Number
1 : 1 configured	**SS-H6AZyy** [7] **-Nzz** [7] **xxxx** [6]

[1] Can only be used in conjunction with tSML HD LC Duplex patch cords.

[2] xxx stands for the cable length in m (any lengths available)

[3] yy stands for the fiber count: 12, 24, 48, 72, 96, 144

[4] xx stands for the cable length in m (max. length 60m)

tSML FO/TP Breakout Modules 19“/0.5U accessories

Cover for Module 19“/0.5U straight

Description	Part Number
Stainless steel	**TSML-M-19/0.5HE-CO**

Cover for Module 19“/0.5U angled

Description	Part Number
Stainless steel	**TSML-MS-19/0.5HE-CO**

FO partial front panel Snap-In with 6x LC Duplex

Description	Part Number
Beige	**TSML-M06LCD-BG**
Blue	**TSML-M06LCD-BL**
Green	**TSML-M06LCD-GN**
Aqua	**TSML-M06LCD-TK**
Magenta	**TSML-M06LCD-VI**

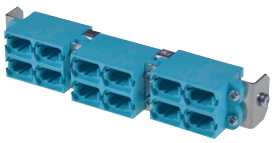
HD FO partial front panel Snap-In with 12x LC Duplex

Description	Part Number
Beige	**TSML-M12LCD-BG** [1]
Blue	**TSML-M12LCD-BL** [1]
Green	**TSML-M12LCD-GN** [1]
Aqua	**TSML-M12LCD-TK** [1]
Magenta	**TSML-M12LCD-VI** [1]

FO partial front panel Snap-In with 6x MPO Key up/down

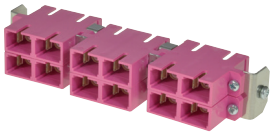
Description	Part Number
Green	**TSML-M06MP-GN**
Aqua	**TSML-M06MP-TK**
Magenta	**TSML-M06MP-VI**

FO partial front panel Snap-In with 12x MPO Key up/down



Description	Part Number
Green	**TSML-M12MP-GN**
Aqua	**TSML-M12MP-TK**
Magenta	**TSML-M12MP-VI**

FO partial front panel Snap-In with 6x SC Duplex



Description	Part Number
Beige	**TSML-M06SCD-BG**
Blue	**TSML-M06SCD-BL**
Green	**TSML-M06SCD-GN**
Aqua	**TSML-M06SCD-TK**
Magenta	**TSML-M06SCD-VI**

Blind plate Snap-In

Description	Part Number
Stainless steel	**TSML-M-BLIND**

tSML TP RJ45 1GbE solution

TP Module 19“/0.5U 4x Telco on 24x RJ45 GbE

Description	Part Number
shielded	**TSML-M24RJ45/TELCO-M**

TP Trunk Cable both ends Telco Female

Description	Part Number
shielded (Standard)	**TSML-TELCO-FF-Cxx** [5]
shielded (Industrial)	**TSML-TELCO-FF-xx** [5]

tSML HD FO Patch cord

FO Patch cord LC HD

Description	Part Number
50/125µ OM3	**L-TLC/TLC50D3Rxxxx** [6]
50/125µ OM4	**L-TLC/TLC50D4Rxxxx** [6]
9/125µ	**L-TLC/TLC09D-Rxxxx** [6]

tSML FO migration to 40GbE

FO Patch cord MPO Male/Female

Type B	Part Number
50/125µ OM3	**L-MP/MPP50I12G3B xxxx** [6]
50/125µ OM4	**L-MP/MPP50I12G4B xxxx** [6]
Type C	**Part Number**
50/125µ OM3	**L-MP/MPP50I12G3C xxxx** [6]
50/125µ OM4	**L-MP/MPP50I12G4C xxxx** [6]

[5] xx stands for the cable length in m (max. length 60m)

[6] xxxx stands for the cable length in cm

[7] yy stands for the boot and zz for the cable color. Colors: GR (grey), GN (green), BL (blue), GE (yellow), RT (red), OR (orange), SW (black)

tde®

trans data elektronik GmbH

For 25 years, the internationally successful company tde has specialised in developing and producing scalable cabling systems for highest packing densities. Numerous in-house developments and continuous improvements to the production process have made tde one of the most advanced fibre optics manufacturers in Europe. In addition to standard equipment such as polishing machines and interferometers the product range also includes laser cleaver, glue robots and fully-automatic machines to prepare the fibres.

tde plays an active part in the DKE/UK 412.7 standardisation committee (fibre optics connection technology and passive optical components) and is also represented on the international CENELEC TC 86BXA/WG 01 panel.

Situated in Dortmund, Germany, the company's top priority is to guarantee customers the highest possible standards in quality. So as to always ensure this aspiration tde employees use interferometers to inspect every pre-assembled connector for grinding geometry and make sure that no assembled product leaves the production site without inspection record. To ensure the highest standards in quality tde has a consistent and systematic quality management system and is certified according to ISO 9001 and ISO 14001. With the TL 9000 quality management system tde was the first German company to receive a special certification for the telecommunications industry in 2002.

Renowned customers

Numerous renowned companies place their trust in the network expert's continuous quality assurance, including the prestigious CERN research centre in Switzerland.

tde equipped almost the entire CERN project with fibre optic connections and installed more than 8,000 single and multi-mode MPO connections. Due to the production process especially optimised by tde using laser cleaving, the MPO connector performs extraordinarily well and is now standardised for data centre cable systems.

This makes the connector attractive for all areas in which high packing density takes first priority. Due to cutting-edge production processes and highest standards in quality tde ranks among the worldwide leading technology experts in the fields of multi-fibre and twisted pair technology. The network expert provides these fields with suitable solutions. One of the largest projects was the development of a mobile Telco-based cabling system for the German armed forces. For many years, this system has been in use at many military bases including Afghanistan.

It also serves as the basis for the tML®-system: The modular cabling system consists of the three core components module, trunk cable and module rack and is the result of many years of experience and improvement processes in the field of copper and fibre optics technology. Just like many other innovations made by tde it is protected by multiple patents.

Quality „Made in Germany“

The tde portfolio comprises full system solutions focusing on Plug & Play for high-speed datacom, telecom, industry, medical and defence applications. The network expert's system solutions are exclusively developed, produced and assembled in Germany.

With its very own service department responsible for planning and installation tde offers competent services from a single source. As a member of the "European Code of Conduct" tde is committed to energy efficiency in data centres and with its standardised, flexible and recyclable system components makes an active contribution to green IT. Customer service is provided by qualified employees with a background in distribution and production.

net. work. solution.

ISO 9001, TL 9000 and ISO 14001 certified

tde® trans data elektronik GmbH

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MADE IN GERMANY tde® Since 25 Years