

tSML - FO Module 19"/0.5U straight 4x MPO/MTP[®] Male/24x LC Duplex 50/125 μ OM4



tSML - tde Semi Modular Link

tSML is a modular developed cabling system, which consists of two core components: module and trunk cable. The system components, preterminated 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. Up to 96x LC duplex and/or 48 x RJ45 of haven can be accommodated in such a way on 1U. At the heart of the System are MPO/MTP[®] and Telco connectors, with which 12 optical fibers or 24 copper pairs can be connected simultaneously. Fiber-optic and twisted pair modules can be combined on 1U within a panel without difficulty.

The end faces of the connectors are optimized by means of Lasercleaving and machine polish. The MPO/MTP[®] plug has a defined fiber height of 1 - 3.5 μ . The max. adjacent fiber height difference is 0.2 μ m and for all fibers 0.3 μ m. All system components (modules, trunk cables and patch cords) are coordinated for the reaching of the performance particularly. The module is marked with sequential serial number and article number. The modules are ROHS compliant.



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Technical Data

| | |
|-------|--|
| Entry | 4 x MPO/MTP [®] Male Adapter (magenta) back |
| Exit | 24 x LC Duplex Adapter (magenta) front |
| Tests | Interferometer, Insertion Loss, Return Loss and Visual Final Inspection; all measured values are electronically archived |
| | QS-Managementssystem ISO 9001, ISO 14001 and TL 9000 |

tSML - FO Modules 19" 0.5U

| | |
|-------------|------------------------|
| Box | stainless steel |
| Front plate | stainless steel |
| Dimensions | 19", 0.5U, depth 11 cm |

FO Adapters

| | |
|-----------------|--------------------------|
| Type | LC Duplex |
| Application | Multimode OM4 |
| Design | One-Piece without flange |
| Connector style | SC simplex |
| Color | Magenta |
| Material | Plastic |
| Sleeve | Zirkonia Straight Split |
| Shutter | -- |
| Manufacturer | tde |

FO Adapters

| | |
|-----------------|--------------------------|
| Type | MPO/MTP [®] |
| Application | Multimode OM4 |
| Design | without Flange |
| Connector style | SC Simplex |
| Key Orientation | Type A, Key up/down |
| Color | Magenta |
| Material | Plastic |
| Sleeve | -- |
| Shutter | -- |
| Standards | IEC 61754-7 TIA 604-5 |
| Manufacturer | US Conec |

FO Connectors

The end faces of the connectors are optimized by means of Lasercleaving and machine polish. The MPO/MTP[®] plug has a

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defined fiber height of 1 - 3.5 μ m. The max. adjacent fiber height difference is 0.2 μ m and for all fibers 0.3 μ m.

Connector

| | |
|--------------|---|
| Type | MPO/MTP [®] Male Push Pull Locking with Elite Pins (magenta) |
| Ferrule | 12 Fiber MM Elite [®] ferrule, PPS |
| Boot colour | Black |
| Manufacturer | tde/US Conec |

Optical Performance

| Fiber | Type | Wavelength | Insertion loss typ. | Insertion loss max. | Return loss min. |
|------------------|----------------------|---------------|---------------------|---------------------|------------------|
| 50/125 μ OM4 | MPO/MTP [®] | 850 / 1300 nm | ≤ 0.16 dB | 0.30 dB | 30 dB |

FO Connectors

| | |
|-----------------------|---|
| Connector Type | LC Unibody Simplex |
| Housing | Plastic, Magenta |
| Ferrule | Zirkonia Staight Split, Spring-loaded Axially |
| Ferrule Hole | 126 μ |
| Mating Cycles | 1.000 |
| Operating Temperature | -40°C up to +75°C |
| Strain Relief to | 100 N |
| Manufacturer | tde |

Optical performance

| Fiber | Type | Wavelength | Insertion loss typ. | Insertion loss max. | Return loss min. |
|------------------|------|---------------|---------------------|---------------------|------------------|
| 50/125 μ OM4 | LC | 850 / 1300 nm | ≤ 0.10 dB | 0.30 dB | 35 dB |

FO Fiber

| | |
|------|---|
| Type | Draka OM4 50/125 μ m bend-insensitive multimode fiber (C32) |
|------|---|

| Standards and Norms | IEC 60793-2-10: type A1a.3 | ITU G.651.1 | TIA/EIA-492 AAAD |
|---------------------|----------------------------|---------------------------|--------------------|
| | ISO/IEC 11801 category OM4 | EN 60793-2-10: type A1a.3 | ANSI/TIA/EIA-568.C |
| | ISO/IEC 24764 | EN 50173-1 category OM4 | IEEE 802.3 |

Optical properties

| | | |
|---|----------------|-------------|
| Maximum attenuation value of cable at 850 nm | IEC 60793-1-40 | ≤ 3.0 dB/km |
| Maximum attenuation value of cable at 1300 nm | IEC 60793-1-40 | ≤ 1.0 dB/km |

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| | | |
|--|----------------|-------------------------------|
| Attenuation limit according to IEC 60793-2-10, 850 nm | IEC 60793-1-40 | ≤ 2.5 dB/km |
| Attenuation limit according to IEC 60793-2-10, 1300 nm | IEC 60793-1-40 | ≤ 0.8 dB/km |
| Inhomogeneity of OTDR trace for any two 1000 metre fiber lengths | IEC 60793-1-40 | Max. 0.1 dB/km |
| Fiber bending loss R=7.5 mm 850/1300 nm | IEC 60793-1-40 | ≤ 0.2 dB / ≤ 0.5 dB |
| Fiber bending loss R=15 mm 850/1300 nm | IEC 60793-1-40 | ≤ 0.1 dB / ≤ 0.3 dB |

Bandwidth

| | | |
|---|----------------|--------------------|
| Overfilled (OFL) modal bandwidth at 850 nm | IEC 60793-1-41 | ≥ 3500 MHz*km |
| Overfilled (OFL) modal bandwidth at 1300 nm | IEC 60793-1-41 | ≥ 500 MHz*km |
| Effective Modal Bandwidth (EMB) at 850 nm | IEC 60793-1-49 | ≥ 4700 MHz*km |
| Group index of refraction at 850 nm | IEC 60793-1-22 | 1.482 |
| Group index of refraction at 1300 nm | IEC 60793-1-22 | 1.477 |

Geometrical / mechanical properties

| | | |
|--|-------------------|---|
| Core diameter | IEC/EN 60793-1-20 | 50 ± 2 μ m |
| Cladding diameter | IEC/EN 60793-1-20 | 125.0 ± 1.0 μ m |
| Cladding non-circularity | IEC/EN 60793-1-20 | $\leq 0.7\%$ |
| Core non-circularity | IEC/EN 60793-1-20 | $\leq 5\%$ |
| Core -cladding concentricity error | IEC/EN 60793-1-20 | ≤ 1 μ m |
| Primary coating diameter - uncoloured | IEC/EN 60793-1-21 | 242 ± 5 μ m |
| Primary coating diameter - coloured | IEC/EN 60793-1-21 | 250 ± 15 μ m |
| Primary coating non-circularity | IEC/EN 60793-1-21 | $\leq 5\%$ |
| Primary coating-cladding concentricity error | IEC/EN 60793-1-21 | ≤ 6 μ m |
| Proof stress level | IEC/EN 60793-1-30 | ≥ 0.7 ($\approx 1\%$) GPa |
| Typical average strip force | IEC/EN 60793-1-32 | 1.7 N |
| Strip force (peak) | IEC/EN 60793-1-32 | 1.3 N $\leq F_{\text{peak,strip}} \leq 8.9$ N |
| Numerical aperture | IEC/EN 60793-1-43 | 0.200 ± 0.015 |

Product variants & accessories

| Art.-No. | Description |
|----------------------|---|
| TSML-M24LCADK/MPP09E | tSML - FO Module 19"/0.5U straight 4x MPO/MTP [®] Male/24x LC APC Duplex 9/125 μ OS2 |
| TSML-M24LCDK/MPP09E | tSML - FO Module 19"/0.5U straight 4x MPO/MTP [®] Male/24x LC Duplex 9/125 μ OS2 |
| TSML-M24LCDK/MPP50G3 | tSML - FO Module 19"/0.5U straight 4x MPO/MTP [®] Male/24x LC Duplex 50/125 μ OM3 |
| TSML-M24LCDK/MPP50G4 | tSML - FO Module 19"/0.5U straight 4x MPO/MTP [®] Male/24x LC Duplex 50/125 μ OM4 |