Data Center

Fiber Optic Solutions

International Edition 2018

Fiber optic solutions you can trust

Contents

A legacy spanning over 25 years

Opterna powers the heart of the digital ecosystem through reliable fiber optic connectivity solutions that are the foundation of every successful organization.

OPTERNA

Established in 1992 as an U.S.-based opto-electronic product company, Opterna has grown into a world class technology company operating in Europe, Asia-Pacific, Middle East and Africa. Over two decades, we cut our teeth leading some of the world's largest fiber optic projects. Over that time, we have evolved as a business through a decade of ideation and product development across a variety of market segments.

OPTERNA's mission is to provide connectivity solutions that continuously add value over the 'life-cycle' of the network. Our products power the most demanding areas of the infrastructure, which are subject to frequent human interaction and constant change. We provide the highest return on investment by simplifying and speeding up the most dynamic network areas. This approach benefits the people managing the infrastructure and those connected to it.

JKH Holdings

OPTERNA is a daughter company of JKH Holdings; a group of innovative companies providing a range of products and services from fiber optics to healthcare and consulting.
These organisations are connected by an unyielding commitment to change lives through technology and bold thinking.


OPTERNA
AT LIFE SPEED®

Operations that span four continents

OPTERNA has fully-owned world-class manufacturing facilities in America, Europe, Asia-Pacific, the Middle East and Africa. We also have sales personnel and technical support staff in these locations, so that we can provide excellent local support to our clients.


MIDDLE EAST
United Arab Emirates - Dubai
AFRICA
Tunisia - Ben Arous
ASIA
India - Kochi
India - Hyderabad
China - Shenzen

Connectivity for the next BIG thing

Data Centers are rapidly becoming the life-support mechanism of the digital age. Slowly but surely, everything will be connected to everything and the Internet of Things (IoT) will become an inevitable reality.

Engineers are preparing their hardware and software solutions, so that businesses and individuals can exploit the fresh revenue streams, and information streams this new age offers.

Data Centers are no longer inter-dependent entities. They are part of a collosal inter-connected mesh, commonly known as 'The Cloud'. This cloud system supports a seemingly infinite array of applications and services which are hosted on physical and virtual servers. A new breed of data centers will emerge that place computing power closer to the EDGE. Bandwidth hungry applications such as video on demand, will require a vast array of micro-data centers to support them.

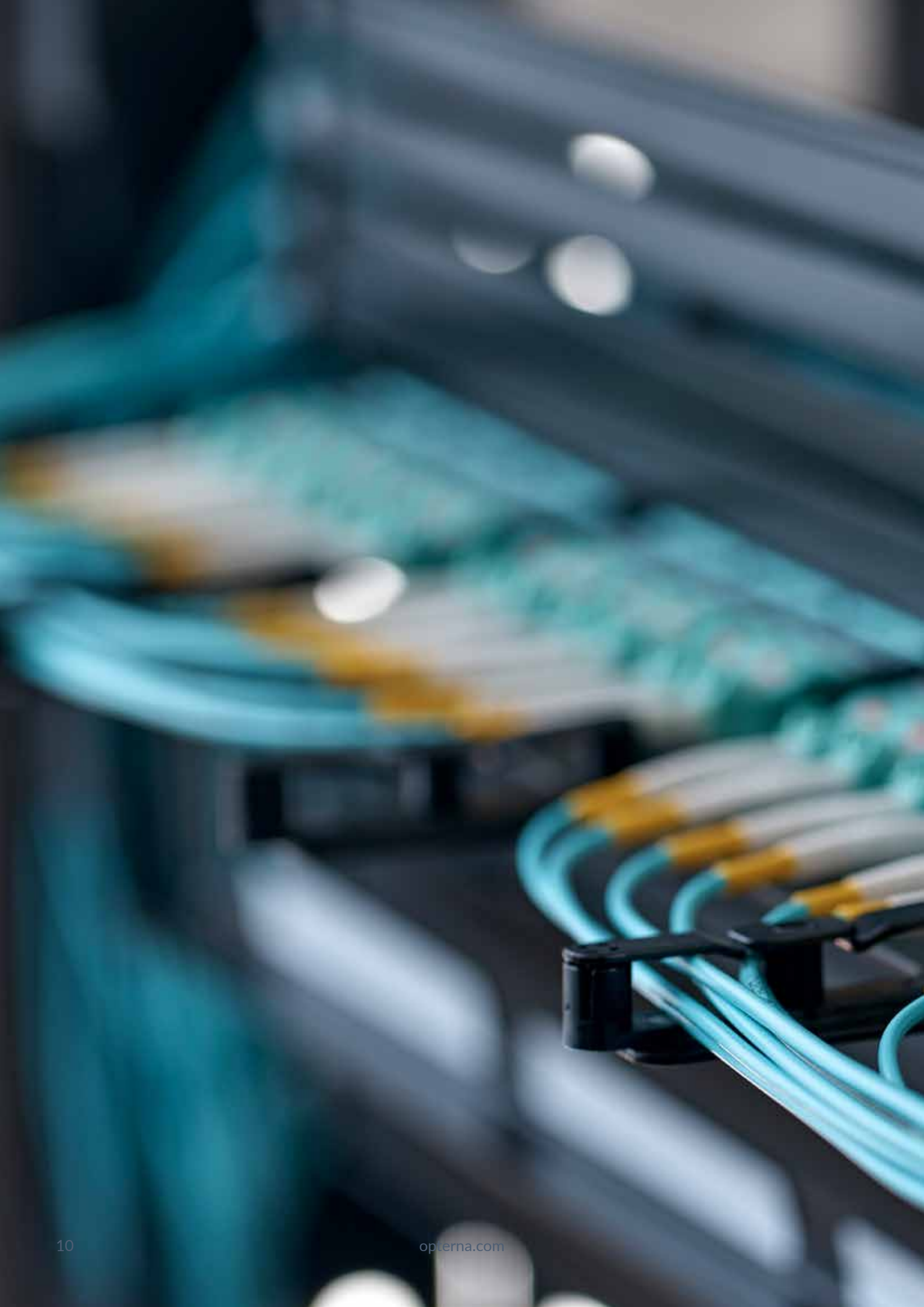
In the midst of all of this rapid growth and dynamic change, we see one true constant remaining and that's 'Fiber Optics'. If data centers are the heart of the digital eco-system, then fiber optics are surely the complex network of veins that deliver vital data to the connected world.

We cannot predict what the next BIG thing will be, but what we do know is that fiber optics will be there to deliver it.

Trust in Fiber? Trust OPTERNA!

Data centers are constantly evolving to satisfy the business-critical requirements of today and the inevitable demands of tomorrow.

OPTERNA solutions are dense and modular allowing operators to scale up their operations on a ‘pay as you grow’ basis. Our connectivity is ready for 100G, 200G, 400G and beyond.



UHD High Density Chassis

The UHD Chassis offers extreme packing density, exceptional connector access, and the flexibility to manage next generation data rates.

"The solution that allows you to transition fibers, splice fibers, patch fibers and TAP fibers all in a single chassis..."

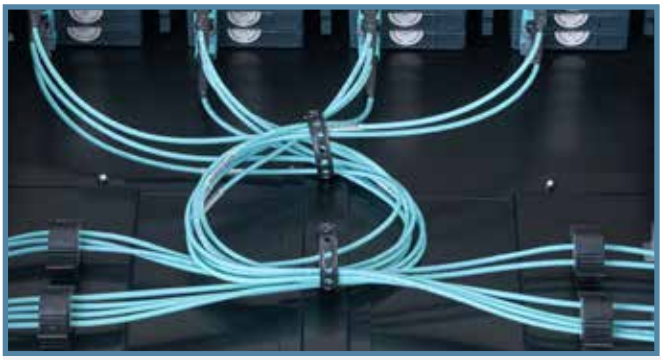
The Ultra-High-Density chassis (UHD) is a modular, standards-based, pre-terminated distribution platform designed to increase port density, improve connector access, and efficiently utilize valuable rack space in data centers.

The DataOpt UHD Chassis can accomodate a staggering 72 LC ports or 72 MPO ports per 1U of rack space. The chassis has a maximum capacity of twelve front or rear installable modules (per 1U) that allow multiple fiber connections to be quickly and efficiently installed and maintained. Integrated fiber management features are provided to secure trunk cables, separate patch cords and maintain safe bend radius during fiber routing.

UHD High Density Chassis

1 **Fast and safe access to connectors**

Slide out each row for fast, unobscured access to connectivity.



2 **Optional rear cable management**

The rear cable support shelf is optional and can be removed for shallower racks.

3 **Tool-less installation of modules**

Modules can be inserted into the UHD chassis in seconds without special tools.

4 **Insert modules from rear or front**

One person can populate the UHD chassis from either side of the rack with ease.

5 **Available as 1U, 2U and 4U**

The UHD is suitable for server connections, switch connections, MoR or EoR.

6 **Up to 864 fibers per 1U (MPO 12)**

Bench-mark packing density allows operators to achieve a better cost-per-port.

Fiber Optic, Ultra High-Density Chassis, **UHD**

Features and benefits

- Available in 1U, 2U and 4U height variants
- Most efficient rack utilization (72 x ports per 1U)
- Fast installation of modules from front or rear
- Fast moves, adds and changes (lower OPEX)
- Easy migration to 40G, 100G and beyond
- Future-proofed with super low-loss connectivity
- Wide range of modules for different applications
- Excellent patch cord routing and guidance
- Clear port identification and traceability
- Robust and secure steel construction

The Ultra-High Density chassis (UHD) is a modular, standards-based, pre-terminated distribution platform designed to increase port density, improve connector access, and efficiently utilize valuable rack space in Data Centers. The UHD Chassis in its basic configuration will serve 72 LC ports per 1U (144 fibers) for all network topologies including 10G, 40G and 100G deployments utilizing high performance 8-fiber, 12-fiber and 24-fiber MPO technology.

The UHD Chassis solution has a maximum capacity of twelve front or rear installable modules (per 1U) that allows multiple fiber connections to be quickly and efficiently installed and maintained, while supporting regular moves, adds and changes. Integrated fiber management features are provided to secure trunk cables, separate patch cords and maintain safe bend radius during fiber routing.

Technical data

Mechanical data	Value
Dimensions (WxDxH)	519mm (20.43”) x 565mm (22.24”) x 1U/2U/4U (1U = 44.45mm)
Weight	1U (4.0 kg), 2U (8.5kg) and 4U (13.8kg)
Material	Steel chassis (powder coated), plastic ABS
Chassis height	1U (44.45mm), 2U (88.9mm) and 4U (177.8mm)
Color	Black RAL 9005
Capacity	12 x modules per 1U (3 x rows and 4 x modules per row)
Density	72 x LC/MPO ports per 1U (144 fibers)
Mounting type	465mm (19”)

Environmental data

Description	Value
Free of halogen	Yes
2011/65/EC RoHS	Fully compliant

Ordering information

UHD Chassis Black (RAL9005)

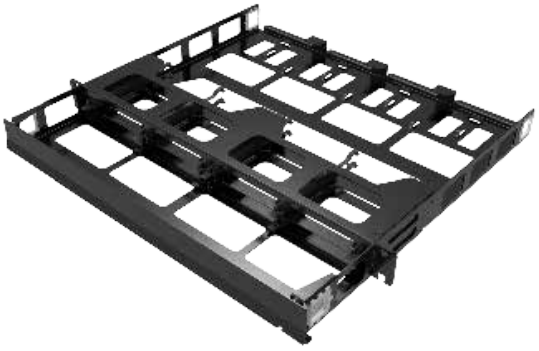
Part number	Description
UHDC1U0412BK1	1U UHD Chassis, 4 modules per row, 12 modules total, short version, Black
UHDC1U1412BK1	1U UHD Chassis, 4 modules per row, 12 modules total, including rear cable shelf, Black
UHDC2U0424BK1	2U UHD Chassis, 4 modules per row, 24 modules total, short version, Black
UHDC2U1424BK1	2U UHD Chassis, 4 modules per row, 24 modules total, including rear cable shelf, Black
UHDC4U0448BK1	4U UHD Chassis, 4 modules per row, 48 modules total, short version, Black
UHDC4U1448BK1	4U UHD Chassis, 4 modules per row, 48 modules total, including rear cable shelf, Black

UHD Cable Management Accessories

Part number	Description
UHD-CABLE-CLAMP-10P	Cable Holder-3.5mm (packing unit 10 pieces)
UHD-CABLE-GROMMET-3.5MM-10P	Rubber Grommet For Cable Holder-3.5mm (packing unit 10 pieces)
UHD-PATCH-CORD-CLIP-10P	Patch cord guiding clip (packing unit 10 pieces)

Fiber Optic, Skeleton Chassis, **SKC**

Features and benefits



- Available in 1U and 2U height variants
- Efficient rack utilization (48 x ports per 1U and 120 ports per 2U)
- Fast installation of modules from front or rear
- Fast moves, adds and changes (lower OPEX)
- Easy migration to 40G, 100G and beyond
- Future-proofed with super low-loss connectivity
- Wide range of modules
- Option door assembly and rear cable manager
- Clear port identification and traceability
- Robust and secure steel construction

The Skeleton chassis (SKC) is a modular, standards-based, pre-terminated distribution platform designed to increase port density, improve connector access, and efficiently utilize valuable rack space in Data Centers. The SKC Chassis in its basic configuration will serve 48 LC ports per 1U (96 fibers) or 120 LC ports per 2U (240 fibers) for all network topologies including 10G, 40G and 100G deployments utilizing high performance 8-fiber, 12-fiber and 24-fiber MPO technology.

The SKC Chassis solution facilitates front or rear installable modules (per 1U) that allows multiple fiber connections to be quickly and efficiently installed and maintained, while supporting regular moves, adds and changes. An optional front cable manager and door assembly can be added to the front of the chassis, and a cable manager can also be added at the rear for incoming trunk cable.

Technical data

Mechanical data	**Value**
Dimensions Chassis (WxDxH)	491mm (19.33”) x 110mm (4.33”) x 1U/2U (1U = 44.45mm/2U = 89mm)
Dimensions Rear Cable Manager (WxDxH)	445mm (17.51”) x 112mm (4.72”) x 1U/2U x
Dimensions Cable Manager Door assembly (WxDxH)	445mm (17.51”) x 120mm (4.72”) x 1U/2U (1U = 44.45mm/2U = 89mm)
Weight Chassis	1U (1.5 kg), 2U (2.5kg)
Material	Steel chassis (powder coated), plastic ABS
Color	Black RAL 9005, Bengal Silver
Capacity	4 x modules per row (2 x rows per 1U/5 x rows per 2U)
Density	48 x LC or MPO ports per 1U/120 x LC or MPO ports per 2U
Mounting type	465mm (19”)

Environmental data

Description	Value
Free of halogen	Yes
2011/65/EC RoHS	Fully compliant

Ordering information

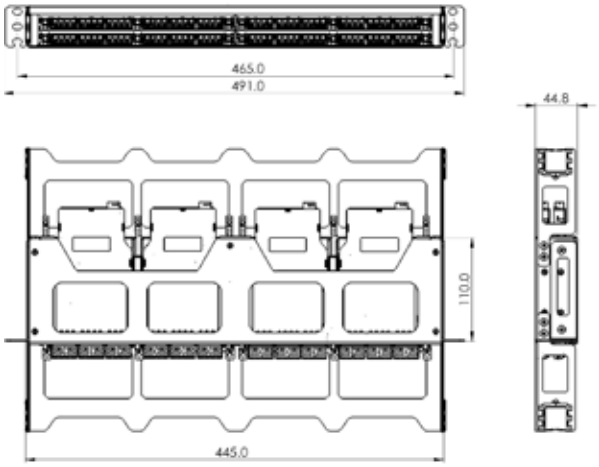
1U SKC Skeleton Chassis Black (RAL9005)

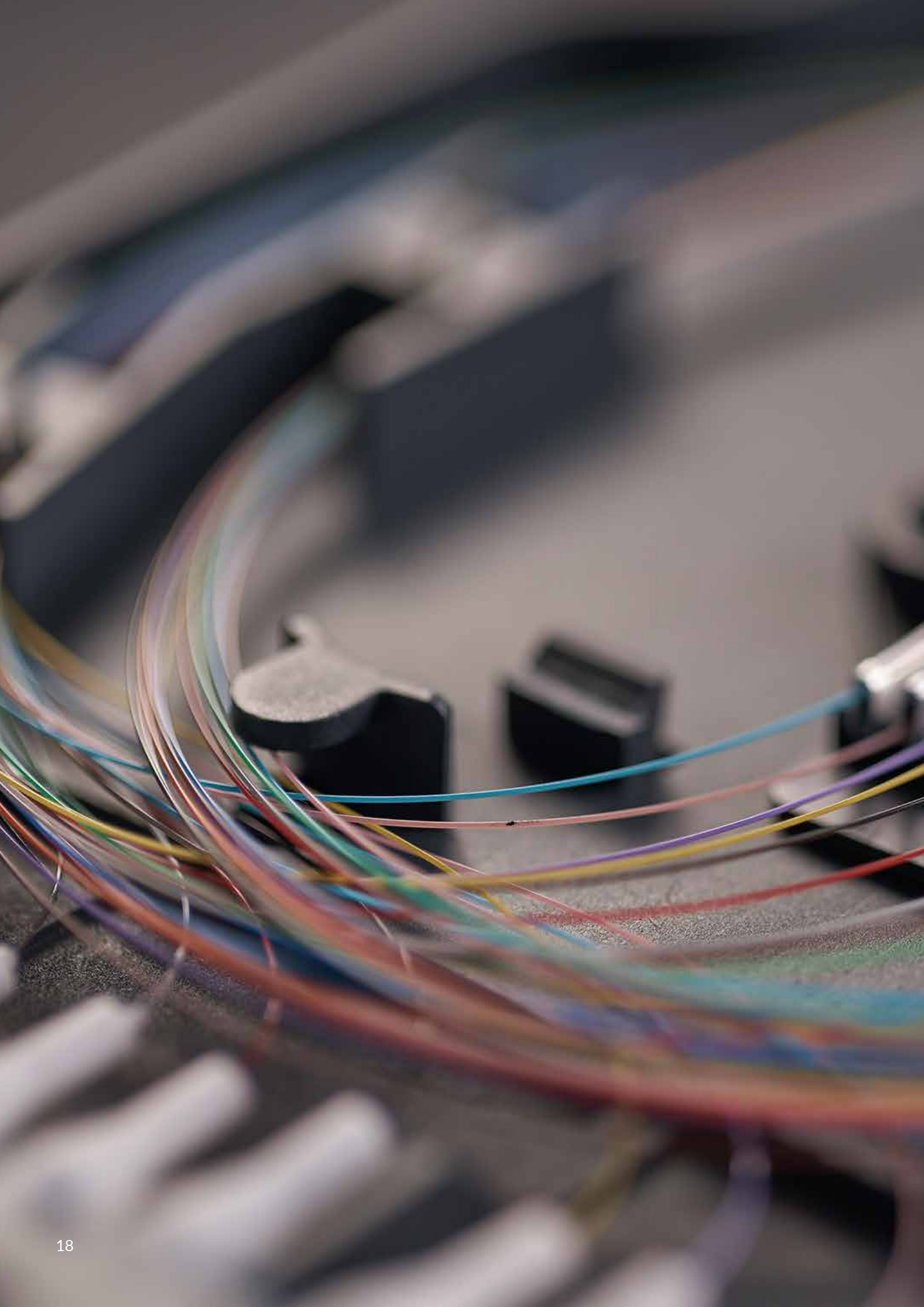
Part number	Description
SKC1U0408BK1	1U SKC Chassis, 4 modules per row, 8 modules total, black
SKC1UFCMBK1	1U Front cable manager (excluding door) for skeleton chassis, black
SKC1UFDMBK1	1U Front cable manager (including door) for skeleton chassis, black
SKC1URCMBK1	1U Rear cable manager for skeleton chassis, black

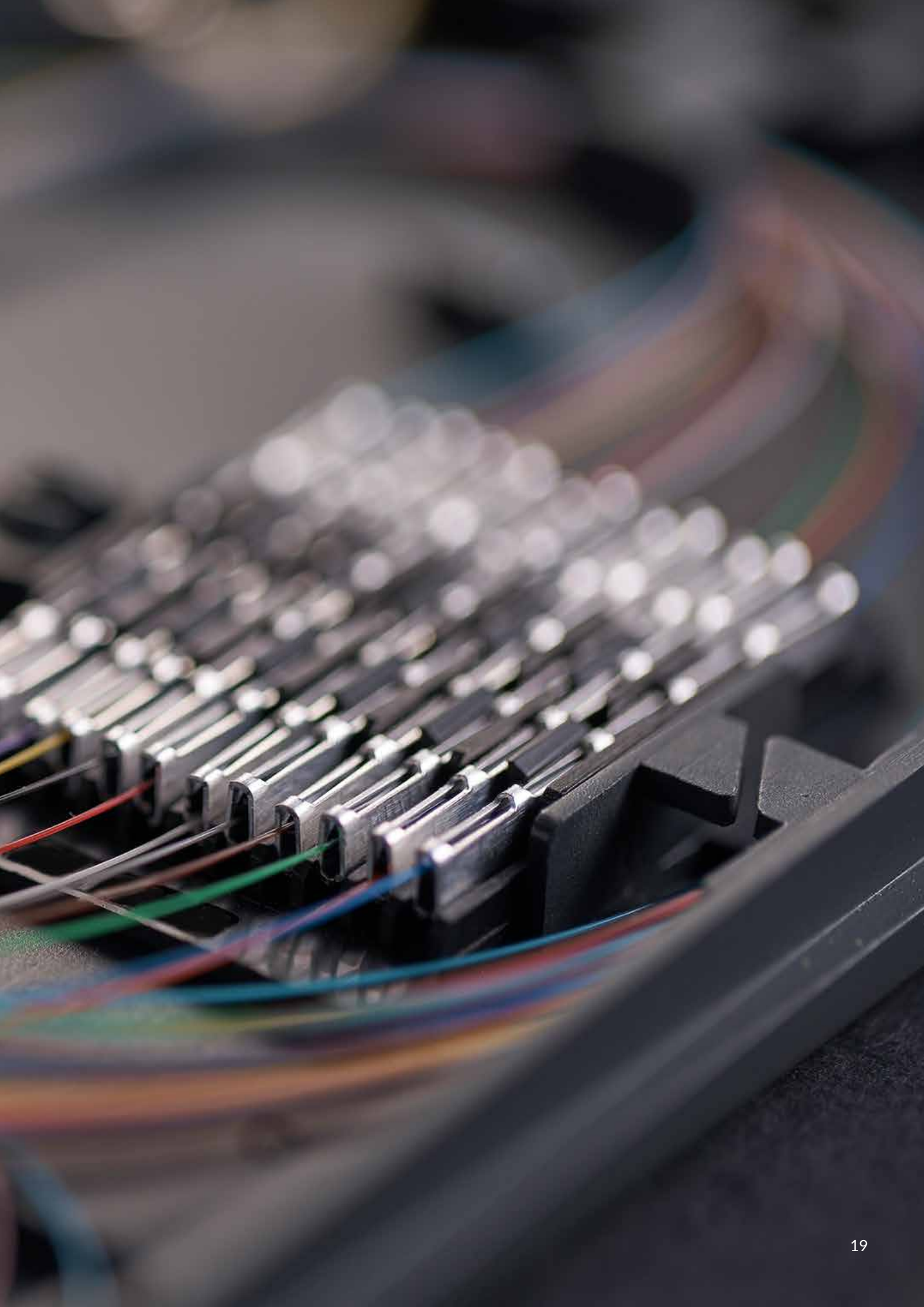
2U SKC Skeleton Chassis Black (RAL9005)

Part number	Description
SKC2U0420BK1	2U SKC Chassis, 4 modules per row, 20 modules total, black
SKC2UFCMBK1	2U Front cable manager (excluding door) for skeleton chassis, black
SKC2UFDMBK1	2U Front cable manager (including door) for skeleton chassis, black
SKC2URCMBK1	2U Rear cable manager for skeleton chassis, black

Drawing (including optional cable managers)







UHD High Density Modules

UHD Modules are compact, modular building blocks allowing operators to build infrastructures quickly and easily. They are diverse and flexible enough to suit all applications, topologies and data rates.

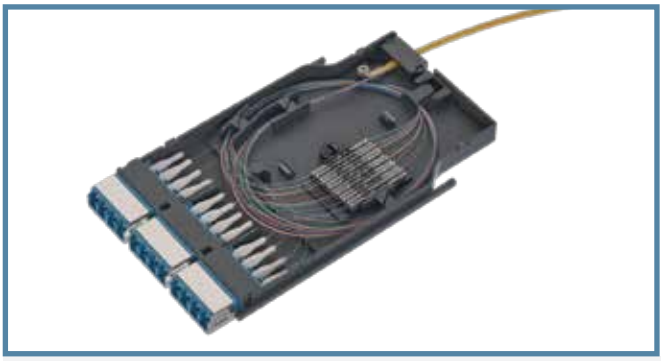
"Modules can be inserted or removed in a matter of seconds without the need for special tools..."

UHD modules are extremely compact cassettes that can be inserted into the UHD chassis from the front or rear. Each module typically has a port-count of 12 fibers, although OPTERNA also offer 8 fiber systems to match emerging SR4 parallel optics.

Every common application and connectivity method can be achieved with the UHD modules including splicing, patching, MPO to LC transition, MPO conversion and TAP monitoring. This diverse range of modules can be mixed and matched in the same chassis so that users can scale up their network as their business evolves.

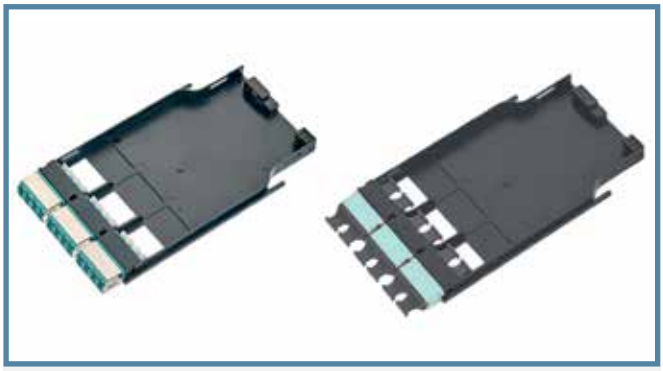
UHD High Density Modules

1 **Wide selection of module types**
Suitable for splicing, patching, converting, transitioning or TAP monitoring.



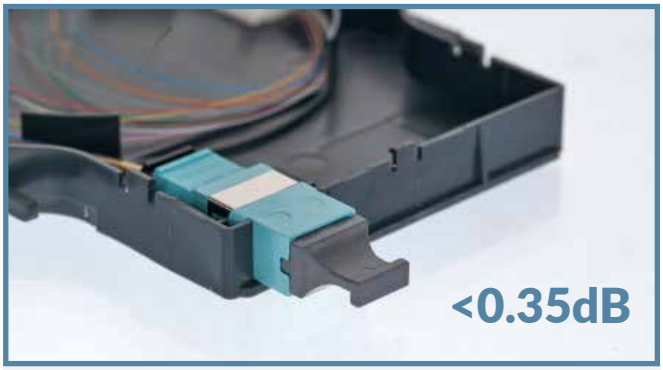
2 **Suitable for ANT splice protectors**
Heat-shrink or ANT type splice protectors can be used within splice modules.

3 **Base-8 and Base-12 ready!**
Suitable for legacy 12 fiber backbones or next generation 8 fiber topologies



4 **LC and MPO patching modules**
Perfect for patching backbone trunk cables directly to the rear of the module.

5 **TAP Monitoring Modules**
Unobtrusive testing of optical links with LC or MPO connectivity



6 **Ultra Low Loss performance**
OPTERNA offer transition modules with ULL performance lower than 0.35dB

Fiber Optic, Modules, UHD, **MPO-LC Transition**

Features and benefits

- Extremely compact design
- Tool-less installation with snap-fixation
- Shuttered LC adapters for dust & laser protection
- Available in OS2, OM3 and OM4 fiber types
- Ultra-low loss performance ≤ 0.35 dB
- Available in Base-8 or Base-12 configurations
- Bend-optimised fiber as standard
- Clear port identification and traceability
- Facilitates easy upgrade to 40G

MPO to LC transition modules allow users to convert Base-8 or Base-12 MPO backbone trunk cables to Base-2 LC adaptors so as to match the transceivers of nearby switches and servers. The MPO connection at the rear of the module provides a high degree of flexibility because the transition module can be easily upgraded to an MPO conversion or patching module at a later stage. This allows users to upgrade from 1G/10G data rates (serial optics) to 40G or 100G data rates (parallel optics).

Transition modules are available with low-loss (LL) or ultra-low loss (ULL) performance depending on the application and distance. With simple inter-connect topologies, low-loss is normally sufficient, however in longer more complex links an ultra-low loss performance may be required.

Technical data

Mechanical data	Value
Dimensions (WxDxH)	86mm (3.38”) x 167mm (6.57”) x 12.1mm (0.47”)
Weight	85 grams (0.085 kg)
Material / colour	PC/ABS Anthracite Grey RAL 7016
Adapter type front	Shuttered LC Quad
Adapter quantity front	2 (Base-8), 3 (Base-12)
Adapter colour front	Blue (OS2), Green (OS2 APC), Aqua (OM3), Heather Violet (OM4)

Optical data	Value
Fiber category	OS2 - 9/125 bend-insensitive, OM3/4/5 - 50/125 µm bend-optimised
Module IL (Low Loss)	Single mode OS2 ≤ 1.0dB Multimode OM3/OM4 ≤ 0.50dB
Module IL (Ultra Low Loss)	Single mode OS2 ≤ 0.60dB Multimode OM3/OM4 ≤ 0.35dB
Module return loss	Singlemode OS2 UPC ≥ 0.50dB Singlemode OS2 APC ≥ 0.60dB Multimode OM3/OM4 ≥ 0.30dB

Ordering information

Base-12 MPO to LC Transition Modules OS2 (A1/A2)

Part number	Description
TM0147S1210ASZ	Base-12 MPO (Male) to LC UPC, OS2 (A1/A2), Polarity Type AS*
TM0147T1210ASZ	Base-12 MPO (Male) to LC UPC, OS2 (A1/A2), Polarity Type AS*, Ultra Low Loss

*Other polarity types available on request such as AF, NS and NF)

Base-8 MPO to LC Transition Modules OM3

Part number	Description
TM0136M0810NS3	Base-8 MPO (Male) to LC UPC, OM3, Polarity NS*, Ultra Low Loss
TM0134M0810NS3	Base-8 MPO (Female) to LC UPC, OM3, Polarity NS*, Ultra Low Loss

*Other polarity types available on request such as AS, AF and NF)

Base-12 MPO to LC Transition Modules OM3

Part number	Description
TM0146M1210AS3	Base-12 MPO (Male) to LC UPC, OM3, Polarity Type AS*, Ultra Low Loss
TM0146M1210NS3	Base-12 MPO (Male) to LC UPC, OM3, Polarity NS*, Ultra Low Loss
TM0144M1210AS3	Base-12 MPO (Female) to LC UPC, OM3, Polarity Type AS* Ultra Low Loss
TM0144M1210NS3	Base-12 MPO (Female) to LC UPC, OM3, Polarity NS*, Ultra Low Loss

*Other polarity types available on request such as AF and NF)

Base-8 MPO to LC Transition Modules OM4

Part number	Description
TM0136M0810NS4	Base-8 MPO (Male) to LC UPC, OM4, Polarity NS*, Ultra Low Loss
TM0134M0810NS4	Base-8 MPO (Female) to LC UPC, OM4, Polarity NS*, Ultra Low Loss

*Other polarity types available on request such as AS and NF)

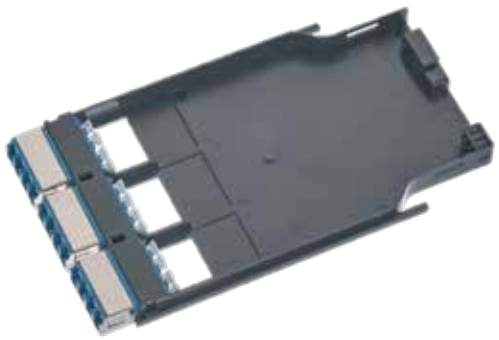
Base-12 MPO to LC Transition Modules OM4

Part number	Description
TM0146M1210AS4	Base-12 MPO (Male) to LC UPC, OM4, Polarity Type AS*, Ultra Low Loss
TM0146M1210NS4	Base-12 MPO (Male) to LC UPC, OM4, Polarity NS*, Ultra Low Loss
TM0144M1210AS4	Base-12 MPO (Female) to LC UPC, OM4, Polarity Type AS*, , Ultra Low Loss
TM0144M1210NS4	Base-12 MPO (Female) to LC UPC, OM4, Polarity NS*, Ultra Low Loss

*Other polarity types available on request such as AS and NF)

Fiber Optic, Modules, UHD, **LC Patching**

Features and benefits



- Extremely compact design
- Tool-less installation
- MPO and LC patching modules types
- Rear cable clamp for fast one-man installation
- Shuttered adapters for dust/laser protection
- Coloured adaptors by performance
- 4 and 6 port variants available
- Clear trunk cable separation

Users building a Base-2 LC link may choose to connect LC trunk harnesses at the rear of the module with LC patch cords at the front. This is common with serial links where equipment ports on the server and switch are both LC duplex type. The most common fiber-count would be 12-fiber so as to maximize the density of the module (6 x LC duplex ports).

Technical data

Mechanical data	Value
Dimensions (WxDxH)	86mm (3.38”) x 167mm (6.57”) x 12.1mm (0.47”)
Weight	85 grams (0.085 kg)
Material / colour	PC/ABS Anthracite Grey RAL 7016
Adapter type front	Shuttered LC Quad or MPO Duplex
Adapter quantity front	2 (4-port), 3 (6-port)
Adapter colour front	Blue (OS2), Green (OS2 APC), Aqua (OM3), Heather Violet (OM4)

Environmental data

Description	Value
Free of halogen	Yes
2011/65/EC RoHS	Fully compliant

Ordering information

LC Patching Modules OS2

Part number	Description
PM4LCUUBU	Patching Module, 4 x LC ports (2 x LC Quad) OS2, Blue
PM6LCUUBU	Patching Module, 6 x LC ports (3 x LC Quad) OS2, Blue
PM4LCUUGN	Patching Module, 4 x LC-APC ports (2 x LC Quad) OS2, Green
PM6LCUUGN	Patching Module, 6 x LC-APC ports (3 x LC Quad) OS2, Green

LC Patching Modules OM3

Part number	Description
PM4LCUUAQ	Patching Module, 4 x LC ports (2 x LC Quad) OM3, Aqua
PM6LCUUAQ	Patching Module, 6 x LC ports (3 x LC Quad) OM3, Aqua

LC Patching Modules OM4

Part number	Description
PM4LCUUHV	Patching Module, 4 x LC ports (2 x LC Quad) OM4, Heather Violet
PM6LCUUHV	Patching Module, 6 x LC ports (3 x LC Quad) OM4, Heather Violet

Fiber Optic, Modules, UHD, **MPO Patching Module**

Features and benefits

- Extremely compact design
- Duplex MPO adapter design
- Key Up/Key Down as standard
- Tool-less installation
- Suitable for 40G and 100G parallel optics
- Rear cable clamp for fast one-man installation
- Coloured adaptors to denote performance
- 4 and 6 port variants available
- Clear trunk cable separation

Base-8, 12 and 24 MPO-MPO patching modules

MPO patching modules can be used in 'Greenfield' data centers to connect MPO backbone trunk cables at the rear of the module, to MPO patch cords at the front of the module. This connection method is common when the transceivers on the server or switch are parallel MPO type (such as QSFP for 40G). Alternatively, MPO patching modules can be used to connector MPO-LC equipment harnesses at the front of the module. This is an effective way of connecting to high-density switches where space is of a premium.

Technical data

Mechanical data	Value
Dimensions (WxDxH)	86mm (3.38") x 167mm (6.57") x 12.1mm (0.47")
Weight	85 grams (0.085 kg)
Material / colour	PC/ABS Anthracite Grey RAL 7016
Adapter type front	MPO Duplex
Adapter quantity front	4-port and 6-port
Adapter colour front	Yellow (OS2 APC), Aqua (OM3), Heather Violet (OM4), Black/Gray (OS2, OM3 and OM4)

Environmental data

Description	Value
Free of halogen	Yes
2011/65/EC RoHS	Fully compliant

Ordering information

MPO Patching Modules OS2

Part number	Description
PM4MPOUDYL	Patching Module, 4 x MPO ports (2 x duplex) OS2, Yellow, Key Up/Key Down
PM6MPOUDYL	Patching Module, 6 x MPO ports (3 x duplex) OS2, Yellow, Key Up/Key Down

MPO Patching Modules OM3

Part number	Description
PM4MPOUDAQ	Patching Module, 4 x MPO ports (2 x duplex) OM3, Aqua, Key Up/Key Down
PM6MPOUDAQ	Patching Module, 6 x MPO ports (3 x duplex) OM3, Aqua, Key Up/Key Down

MPO Patching Modules OM4

Part number	Description
PM4MPOUDHV	Patching Module, 4 x MPO ports (2 x duplex) OM4, Heather Violet, Key Up/Key Down
PM6MPOUDHV	Patching Module, 6 x MPO ports (3 x duplex) OM4, Heather Violet, Key Up/Key Down

MPO Patching Modules OS2, OM3 or OM4

Part number	Description
PM4MPOUDBK	Patching Module, 4 x MPO ports (2 x duplex) OM4, Black, Key Up/Key Down
PM6MPOUDBK	Patching Module, 6 x MPO ports (3 x duplex) OM4, Black, Key Up/Key Down
PM4MPOUUGY	Patching Module, 4 x MPO ports (2 x duplex) OM4, Gray, Key Up/Key Up
PM6MPOUUGY	Patching Module, 6 x MPO ports (3 x duplex) OM4, Gray, Key Up/Key Up

Fiber Optic, Modules, UHD, **Splicing**

Features and benefits

- Extremely compact design
- Up to 12 fibers per module
- Tool-less installation
- Shuttered adapters for dust/laser protection
- Available in OS1, OS2, OM3 and OM4
- Strain relief for cable jacket and kevlar
- Available for pigtail and ribbon splicing
- Clear port identification and traceability
- Safe internal routing of fibers
- For cable 3.3-3.5mm and 5mm
- Suitable for OFBLT ben-limiting conduit

Splicing modules allow users to fusion splice micro cables, loose-tube cables or ribbon cables to factory assembled pigtails. The splice clip is interchangeable allowing different splice protectors to be integrated into the same module such as heat-shrink, ribbon or sandwich (ANT) type. A transparent cover protects the internal fibers and provides a visual reference of the installation.

Protective conduit can also be snapped into the rear of the module in cases where higher density cables are spliced or where non-standard cable constructions are used. Fusion splicing is generally more common in singlemode applications where operators consolidate cables into high-density cross-connect racks.

Technical data

Mechanical data	Value
Dimensions (WxDxH)	86mm (3.38”) x 167mm (6.57”) x 12.1mm (0.47”)
Weight	85 grams (0.085 kg)
Material / colour	PC/ABS Anthracite Grey RAL 7016
Adapter type front	Shuttered LC Quad
Adapter quantity front	3 x LC Quad (12 fiber)
Adapter colour front	Blue (OS2), Green (OS2 APC), Aqua (OM3), Heather Violet (OM4)

Optical data	Value
Fiber count	12 fiber (8 fiber on request)
Weight	OS2 - 9/125, OM3/4/5 - 50/125 bend-optimised
Module insertion loss IL	Single mode OS2 ≤0.50dB max Multimode OM3/OM4 ≤0.50dB max
Module return loss RL	Singlemode OS2 UPC ≥ 0.55dB Singlemode OS2 APC ≥ 0.60dB Multimode OM3/OM4 ≥ 0.30dB

Environmental data

Description	Value
Free of halogen	Yes
2011/65/EC RoHS	Fully compliant

Ordering information

LC Splicing Modules OS2 (A1/A2)

Part number	Description
SM1210ZHSLTIA	Splicing Module, 12 fiber, LC-PC, OS2 (A1), Heatshrink Large, TIA code
SM1211ZHSLTIA	Splicing Module, 12 fiber, LC-APC, OS2 (A1), Heatshrink Large, TIA code
SM1210ZHSRTIA	Splicing Module, 12 fiber, LC-PC, OS2 (A1), Heatshrink Ribbon, TIA code
SM1211ZHSRTIA	Splicing Module, 12 fiber, LC-APC, OS2 (A1), Heatshrink Ribbon, TIA code
SM1210ZHSRUNI	Splicing Module, 12 fiber, LC-PC, OS2 (A1), Heatshrink Ribbon, UNI code
SM1211ZHSRUNI	Splicing Module, 12 fiber, LC-APC, OS2 (A1), Heatshrink Ribbon, UNI code
SM1210ZANTTIA	Splicing Module, 12 fiber, LC-PC, OS2 (A1), ANT crimp, TIA code
SM1211ZANTTIA	Splicing Module, 12 fiber, LC-APC, OS2 (A1), ANT crimp, TIA code

LC Splicing Modules OM3

Part number	Description
SM12103HSLTIA	Splicing Module, 12 fiber, LC-PC, OM3, Heatshrink Large, TIA code
SM12103HSRTIA	Splicing Module, 12 fiber, LC-PC, OM3, Heatshrink Ribbon, TIA code
SM12103HSRUNI	Splicing Module, 12 fiber, LC-PC, OM3, Heatshrink Ribbon, UNI code
SM12103ANTTIA	Splicing Module, 12 fiber, LC-PC, OM3, ANT Crimp, TIA code

LC Splicing Modules OM4

Part number	Description
SM12104HSLTIA	Splicing Module, 12 fiber, LC-PC, OM4, Heatshrink Large, TIA code
SM12104HSRTIA	Splicing Module, 12 fiber, LC-PC, OM4, Heatshrink Ribbon, TIA code
SM12104HSRUNI	Splicing Module, 12 fiber, LC-PC, OM4, Heatshrink Ribbon, TIA code
SM12104ANTTIA	Splicing Module, 12 fiber, LC-PC, OM4, ANT Crimp, TIA code

Fiber Optic, Modules, UHD, **MPO Conversion**

Features and benefits

- Converts Base-8, 12 and 24 backbones
- Support emerging Base-8 SR4 topologies
- Allows 100% fiber utilization in the backbone
- Fast and tool-less installation
- Facilitates direct patching to transceiver
- Ultra-Low Loss performance
- Available in multimode OM3/OM4
- Compatible with UHD chassis 1U, 2U and 4U

MPO conversion modules provide an easy upgrade path for users who want to convert their pre-installed MPO backbone cables to match evolving transceiver requirements. This process allows users to achieve 100% fiber utilization from their existing infrastructure without wasting any of the fibers. For example, two Base-12 backbone trunks can be converted to three Base-8 MTP connectors (40G SR4) or alternatively they can be converted to a single Base-24 MTP connector (100G SR10).

Conversion harnesses are also available in cases where the optical link budget does not allow for a module based system (with 2 x mated MPO/MTP pairs). This might be the case if the link is built as a cross-connect topology.

Technical data

Mechanical data	Value
Dimensions (WxDxH)	86mm (3.38”) x 167mm (6.57”) x 12.1mm (0.47”)
Weight	85 grams (0.085 kg)
Material / colour	PC/ABS Anthracite Grey RAL 7016
Adapter type front	MPO duplex
Adapter quantity front	Front max. 3 (6-port), Rear max. 2 (4-port)
Adapter colour front	Aqua (OM3), Heather Violet (OM4)

Optical data	Value
Fiber count	Subject to configuration
Fiber category	OM3/4 - 50/125 µm bend-optimised
Module insertion loss IL	Multimode OM3/OM4 ≤ 0.50dB max
Module return loss RL	Multimode OM3/OM4 ≥ 0.30dB

Environmental data

Description	Value
Free of halogen	Yes
2011/65/EC RoHS	Fully compliant

Ordering information

MPO Conversion Modules OM3

Part number	Description
CM0447UD0637UD12	4 × MPO12 (Male) rear, KU/KD, 6 × MPO8 (Male) front, KU/KD, OS2
CM0445UD0637UD12	4 × MPO12 (Female) rear, KU/KD, 6 × MPO8 (Male) front, KU/KD, OS2
CM0447UD0267UD12	4 × MPO12 (Male) rear, KU/KD, 2 × MPO24 (Male) front, KU/KD, OS2
CM0445UD0267UD12	4 × MPO12 (Female) rear, KU/KD, 2 × MPO24 (Male) front, KU/KD, OS2
CM0267UD0637UD12	2 × MPO24 (Male) rear, KU/KD, 6 × MPO8 (Male) front, KU/KD, OS2
CM0265UD0637UD12	2 × MPO24 (Female) rear, KU/KD, 6 × MPO8 (Male) front, KU/KD, OS2

MPO Conversion Modules OM3

Part number	Description
CM0446UD0636UD13	4 × MPO12 (Male) rear, KU/KD, 6 × MPO8 (Male) front, KU/KD, OM3
CM0444UD0636UD13	4 × MPO12 (Female) rear, KU/KD, 6 × MPO8 (Male) front, KU/KD, OM3
CM0446UD0266UD13	4 × MPO12 (Male) rear, KU/KD, 2 × MPO24 (Male) front, KU/KD, OM3
CM0444UD0266UD13	4 × MPO12 (Female) rear, KU/KD, 2 × MPO24 (Male) front, KU/KD, OM3
CM0266UD0636UD13	2 × MPO24 (Male) rear, KU/KD, 6 × MPO8 (Male) front, KU/KD, OM3
CM0264UD0636UD13	2 × MPO24 (Female) rear, KU/KD, 6 × MPO8 (Male) front, KU/KD, OM3

MPO Conversion Modules OM4

Part number	Description
CM0446UD0636UD14	4 × MPO12 (Male) rear, KU/KD, 6 × MPO8 (Male) front, KU/KD, OM4
CM0444UD0636UD14	4 × MPO12 (Female) rear, KU/KD, 6 × MPO8 (Male) front, KU/KD, OM4
CM0446UD0266UD14	4 × MPO12 (Male) rear, KU/KD, 2 × MPO24 (Male) front, KU/KD, OM4
CM0444UD0266UD14	4 × MPO12 (Female) rear, KU/KD, 2 × MPO24 (Male) front, KU/KD, OM4
CM0266UD0636UD14	2 × MPO24 (Male) rear, KU/KD, 6 × MPO8 (Male) front, KU/KD, OM4
CM0264UD0636UD14	2 × MPO24 (Female) rear, KU/KD, 6 × MPO8 (Male) front, KU/KD, OM4

NOTE: The configurations above have been created on the assumption that a Female to Female MPO patch cord will be used to connect from the front of the conversion module to the transceiver in the switch. Transceiver ports are always male (pinned), therefore it is good practice to use a patch cord that is female on both ends. This prevents the risk of damaging the transceiver port by accidentally plugging in a male (pinned) connector.

Fiber Optic, Modules, UHD, **LC to LC TAP Monitoring**

Features and benefits

- Extremely compact design (tool-less installation)
- Allows completely passive TAP monitoring
- Minimal disruption to network
- Easy installation and servicing from the front side
- Available in OS2 and OM3/OM4 fiber types
- Ultra-low loss connector/splitter performance
- Color-coded TAP ports for easy identification
- Different split ratios available (50:50, 70:30)
- Clear port identification and traceability

LC to LC TAP modules allow users to monitor serial traffic passively without disrupting the live transmission signal. Splitters inside the module split the input signal into two separate fibers, one that is used for monitoring and the other for the continuation of the input signal. The central black adapter in the module is used for monitoring ports 1,2,3 and 4 respectively.

Technical data

Mechanical data	Value
Dimensions (W xw D x H)	86mm (3.38”) x 167mm (6.57”) x 12.1mm (0.47”)
Weight	85 grams (0.085 kg)
Material / colour	PC/ABS Anthracite Grey RAL 7016
Adapter type front	Shuttered LC Quad
Adapter TAP colour	Red
Adapter LIVE colour	Blue (OS2 PC), Black (OM3/OM4)

Optical data Singlemode OS2 (50:50 split)	Value
Max. Insertion Loss Live Link/Tap Link SM-1310 nm	4.6dB/4.6dB
Splitter loss for TAP modules	3.6 dB LIVE / 3.6 dB TAP

Optical data Singlemode OS2 (70:30 split)	Value
Max. Insertion Loss Live Link/Tap Link SM-1310 nm	3.0dB/7.0dB
Splitter loss for TAP modules	2.0 dB LIVE / 6.0 dB TAP

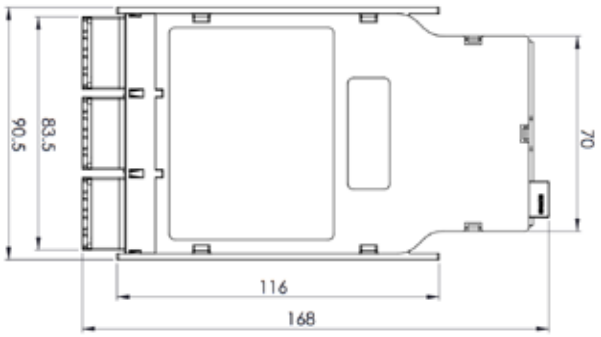
Optical data Multimode OM4 (50:50 split)	Value
Max. Insertion Loss Live Link/Tap Link MM-850 nm	3.9dB/3.9dB
Splitter loss for TAP modules	3.6 dB LIVE / 3.6 dB TAP
Max. Insertion Loss Live Link/Tap Link MM-850 nm	4.1dB

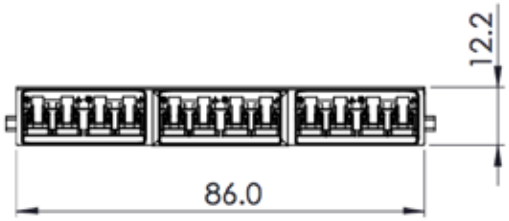
Optical data Multimode OM4 (70:30 split)	Value
Max. Insertion Loss Live Link/Tap Link MM-850 nm	2,1dB/6.9dB
Splitter loss for TAP modules	1.8 dB LIVE / 6.6 dB TAP
Max. Insertion Loss Live Link/Tap Link MM-850 nm	4.1dB

Environmental data

Description	Value
Free of halogen	Yes
2011/65/EC RoHS	Fully compliant

Technical drawing





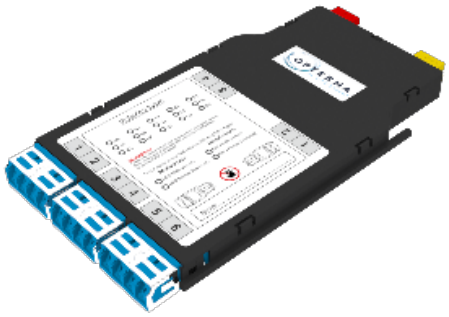
Ordering information

Description	Part code
LC to LC TAP module, 12 fibers, 4 x TAP ports, 50% TAP, Singlemode OS2	TAPMA1250-502A
LC to LC TAP module, 12 fibers, 4 x TAP ports, 70% TAP, Singlemode OS2	TAPMA1270-302A
LC to LC TAP module, 12 fibers, 4 x TAP ports, 50% TAP, Multimode OM4	TAPMA1250-504A
LC to LC TAP module, 12 fibers, 4 x TAP ports, 70% TAP, Multimode OM4	TAPMA1270-304A

Fiber Optic, Modules, UHD, **MPO to LC TAP Monitoring**

Features and benefits

- Extremely compact design (tool-less installation)
- Allows completely passive TAP monitoring
- Minimal disruption to network
- Easy installation and servicing from the front side
- Available in OS2 and OM3/OM4 fiber types
- Ultra-low loss connector/splitter performance
- Color-coded TAP ports for easy identification
- Different split ratios available (50:50, 70:30)
- Clear port identification and traceability



MPO to LC TAP modules allow users to monitor serial traffic passively without disrupting the live transmission signal. Splitters inside the module split the input signal into two separate fibers, one which is used for monitoring and the other for the continuation of the input signal. The MPO port at the rear of the module can be used for monitoring all of the 6 ports by means of a MPO to LC harness. This method facilitates TAP monitoring without consuming any any additional space in the chassis.

Technical data

Mechanical data	Value
Dimensions (W xw D x H)	86mm (3.38”) x 167mm (6.57”) x 12.1mm (0.47”)
Weight	85 grams (0.085 kg)
Material / colour	PC/ABS Anthracite Grey RAL 7016
Adapter type front	Shuttered LC Quad front/Duplex MPO rear
Adapter TAP colour	Red
Adapter LIVE colour	Blue (OS2 PC), Black (OM3/OM4)

Optical data Singlemode OS2 (50:50 split)	Value
Max. Insertion Loss Live Link/Tap Link SM-1310 nm	3.6 dB / 3.6 dB
Splitter loss for TAP modules	3.6 dB LIVE / 3.6 dB TAP

Optical data Singlemode OS2 (70:30 split)	Value
Max. Insertion Loss Live Link/Tap Link SM-1310 nm	3.25 dB / 7.25 dB
Splitter loss for TAP modules	2.0 dB LIVE / 6.0 dB TAP

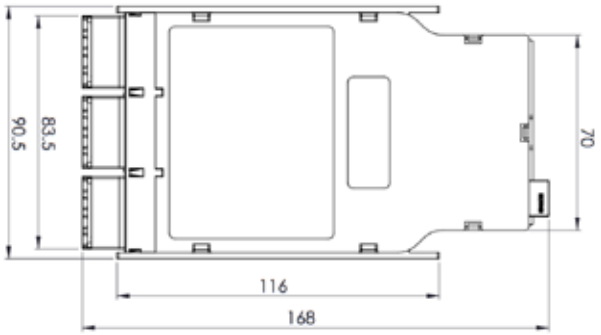
Optical data Multimode OM4 (50:50 split)	Value
Max. Insertion Loss Live Link/Tap Link MM-850 nm	3.9dB/3.9dB
Splitter loss for TAP modules	3.6 dB LIVE / 3.6 dB TAP
Max. Insertion Loss Live Link/Tap Link MM-850 nm	4.1dB

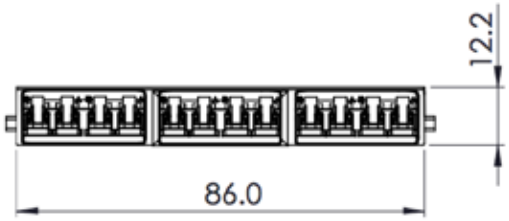
Optical data Multimode OM4 (70:30 split)	Value
Max. Insertion Loss Live Link/Tap Link MM-850 nm	2,1dB/6.9dB
Splitter loss for TAP modules	1.8 dB LIVE / 6.6 dB TAP
Max. Insertion Loss Live Link/Tap Link MM-850 nm	4.1dB

Environmental data

Description	Value
Free of halogen	Yes
2011/65/EC RoHS	Fully compliant

Technical drawing





Ordering information

Description	Part code
MPO to LC TAP module, 12 fibers, 6 x ports, 50% TAP, Singlemode OS2	TAPMB1250-502A
MPO to LC TAP module, 12 fibers, 6 x ports, 70% TAP, Singlemode OS2	TAPMB1270-302A
MPO to LC TAP module, 12 fibers, 6 x ports, 50% TAP, Multimode OM4	TAPMB1250-504A
MPO to LC TAP module, 12 fibers, 6 x ports, 70% TAP, Multimode OM4	TAPMB1270-304A

Fiber Optic, Modules, UHD, **MPO to MPO TAP Monitoring**

Features and benefits

- Extremely compact design (tool-less installation)
- Allows completely passive TAP monitoring
- Minimal disruption to network
- TAP monitor 6 x 10G LC ports or 1 x 40G port
- Easy installation and servicing from the front side
- Available in OS2 and OM3/OM4 fiber types
- Ultra-low loss connector/splitter performance
- Color-coded TAP ports for easy identification
- Different split ratios available (50:50, 70:30)
- Clear port identification and traceability

MPO to MPO TAP modules allow users to monitor serial traffic passively without disrupting the live transmission signal. Splitters inside the module split each of the input signals into two separate fibers, one of which is used for monitoring and the other for the continuation of the input signal.

The MPO TAP port at the front or rear of the module can be used for monitoring all of the 6 ports by means of a MPO to LC harness. This method facilitates TAP monitoring without consuming any any additional space in the chassis.

Technical data

Mechanical data	Value
Dimensions (W xw D x H)	86mm (3.38”) x 167mm (6.57”) x 12.1mm (0.47”)
Weight	85 grams (0.085 kg)
Material / colour	PC/ABS Anthracite Grey RAL 7016
Adapter type front	Shuttered LC Quad front/Duplex MPO rear
Adapter TAP colour	Red
Adapter LIVE colour	Blue (OS2 PC), Black (OM3/OM4)

Optical data Singlemode OS2 (50:50 split)	Value
Max. Insertion Loss Live Link/Tap Link SM-1310 nm	3.6 dB / 3.6 dB
Splitter loss for TAP modules	3.6 dB LIVE / 3.6 dB TAP

Optical data Singlemode OS2 (70:30 split)	Value
Max. Insertion Loss Live Link/Tap Link SM-1310 nm	2.0 dB / 6.0 dB
Splitter loss for TAP modules	2.0 dB LIVE / 6.0 dB TAP

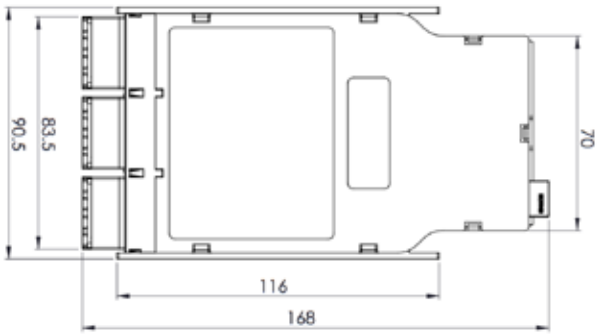
Optical data Multimode OM4 (50:50 split)	Value
Max. Insertion Loss Live Link/Tap Link MM-850 nm	3.8 dB / 3.8 dB
Splitter loss for TAP modules	3.8 dB LIVE / 3.8 dB TAP
Max. Insertion Loss Live Link/Tap Link MM-850 nm	4.1dB

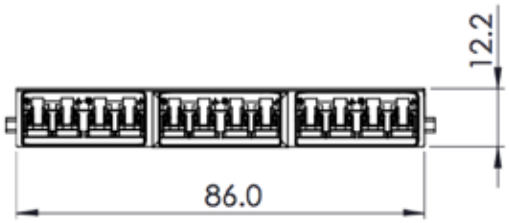
Optical data Multimode OM4 (70:30 split)	Value
Max. Insertion Loss Live Link/Tap Link MM-850 nm	1.8 dB / 6.6 dB
Splitter loss for TAP modules	1.8 dB LIVE / 6.6 dB TAP
Max. Insertion Loss Live Link/Tap Link MM-850 nm	4.1dB

Environmental data

Description	Value
Free of halogen	Yes
2011/65/EC RoHS	Fully compliant

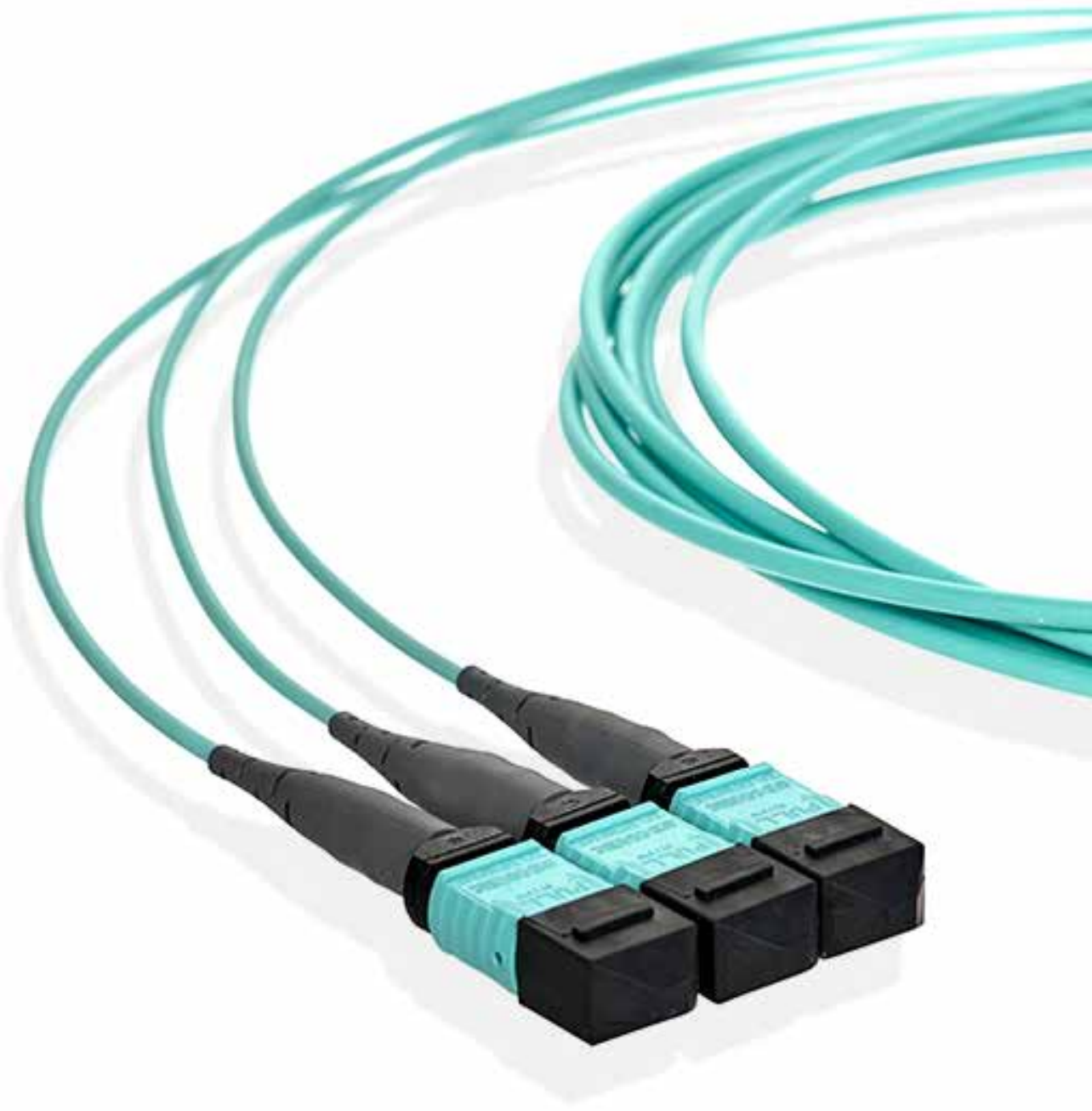
Technical drawing





Ordering information

Description	Part code
MPO to MPO TAP module, 12 fibers, 6 x TAP ports rear, 50%, Singlemode OS2	TAPMC1250-502A
MPO to MPO TAP module, 12 fibers, 6 x TAP ports rear, 70%, Singlemode OS2	TAPMC1270-302A
MPO to MPO TAP module, 12 fibers, 6 x TAP ports rear, 50%, Multimode OM4	TAPMC1250-504A
MPO to MPO TAP module, 12 fibers, 6 x TAP ports rear, 70%, Multimode OM4	TAPMC1270-304A
MPO to MPO TAP module, 12 fibers, 6 x TAP ports front, 50%, Singlemode OS2	TAPMD1250-502A
MPO to MPO TAP module, 12 fibers, 6 x TAP ports front, 70%, Singlemode OS2	TAPMD1270-302A
MPO to MPO TAP module, 12 fibers, 6 x TAP ports front, 50%, Multimode OM4	TAPMD1250-504A
MPO to MPO TAP module, 12 fibers, 6 x TAP ports front, 70%, Multimode OM4	TAPMD1270-304A



MPO Cable Assemblies

High-density MPO cable assemblies that combine ‘ultra-low-loss’ performance with ‘best-in-class’ flexibility and practicality in the field.

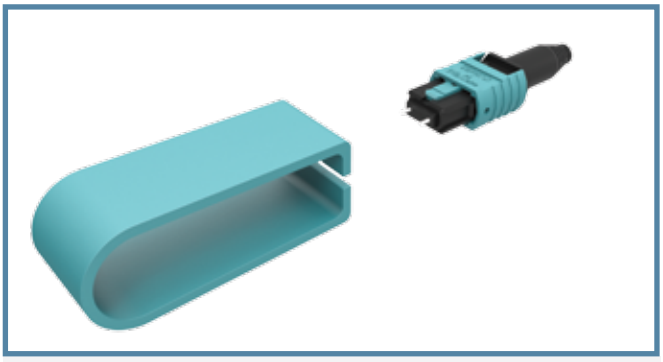
“Assemblies can be converted from polarity Type A assemblies to polarity Type B assemblies, or from male to female or vice versa….”

OPTERNA offers unique MPO connectivity that can be gender-flipped and polarity-flipped in the field, so that one assembly can serve multiple applications. This flexibility is extremely valuable to operators who are struggling to manage legacy infrastructures and emerging next generation infrastructures.

Legacy infrastructures generally have a female, type A assembly, whereas todays requirements are generally for a male, type B assembly. With the OPTERNA product, you have a higher degree of flexibility whether you want to take advantage of it or not.

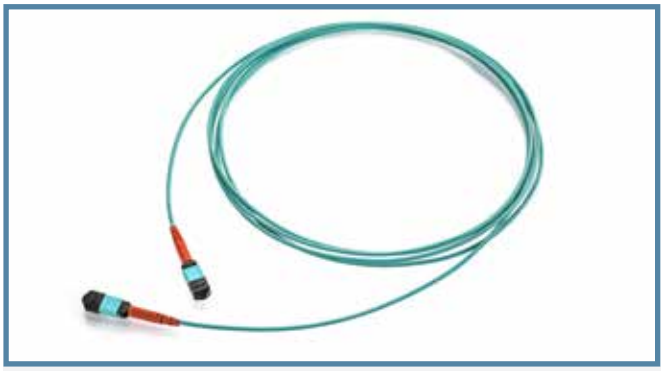
MPO Cable Assemblies

1 **Ultra Low Loss Connectivity**
Mated MPO performance as low as 0.35dB for improved link-budgets.



2 **MPO gender-change in the field**
Remove guiding pins from male assemblies to produce female assemblies.

3 **Retractable key to change polarity**
Simply retract the key on one side and extract it on the other to change polarity.



4 **Base-8, 12 and 24 assemblies**
OPTERNA cover all standard Base types to suit legacy 10G and future 40G/100G.

5 **Made to measure harnesses**
Harnesses that are compact and perfectly tailored to suit switches and servers.

6 **Conversion Harnesses**
Convert legacy Base-12 and Base-24 MPO infrastructures to next-generation Base-8.

Fiber Optic, Single-Stranded Trunk Cable, **MPO-MPO**

Features and benefits

- Fiber-count 12 and 24 fibers
- Over-jacketed for increased protection
- Bend-insensitive/bend optimized fibers
- Plenum (OFNP / FT6), LSZH Riser OFNR (FT-4-ST1)
- OS2, OM3 and OM4 performance types
- Colored outer-jacket to denote performance
- Ultra-low loss connector performance
- Suitable for routing in trays, racks and under raised floors
- Colored jacket for easy identification
- Compact 3mm strands for easy routing within racks and panels

Opterna single-stranded trunks provide the backbone connection between patch panels in the data center. Single stranded trunks offer a high degree of flexibility and scalability and Opterna offer these with a secondary jacket to give a higher degree of protection within cable path ways.

Single-stranded trunks provide a scalable solution for users who wish to deploy just 12 or 24 fibers in a single cable rather than high fiber-count multi-stranded cables. This bite-sized approach makes it easier to redeploy cables if necessary and it helps to spread the costs of periodical installations.

With this cable construction, you get the best of both worlds because the cable is robust and protected in the pathways yet compact and flexible inside racks and in front of equipment. Opterna recommend that trunk cables are configured with male connectors at each end and polarity type B. This simplifies the upgrade path to higher data rates such as 40G and 100G.

Technical data

Mechanical data	Value	12	24
Design	mm	1 x 12 bare fiber	1 x 24 bare fiber
Sub-unit nominal diameter	mm	2.9mm ±0.2	3.6mm ±0.2
Outer cable nominal diameter	mm	4.5mm ±0.2	5.6mm ±0.2
Max installation tension	N	440	
Max. operation tension	N	132	
Min. bending radius without tension	mm	10 x cable Ø	
Min. bending radius under maximum tension	ºC	20 x cable Ø	

Optical data	Value
Fiber category	OS2 - 9/125 bend insensitive OM3/4 bend-optimized
Trunk IL (LL/Low Loss)	Single mode OS2 ≤1.5dB Multimode OM3/OM4 ≤0.70dB
Trunk IL (ULL/Ultra Low Loss).	Single mode OS2 ≤0.70dB Multimode OM3/OM4 ≤0.50dB
Trunk RL (Return Loss)	Singlemode OS2 UPC ≥ 50dB Singlemode OS2 APC ≥ 60dB Multimode OM3/OM4 ≥ 30dB

Environmental data

Description	Value
Installation	LSZH (-10º C to +60º C), PLENUM (0º C to +60º C)
Transport and storage	- 40º C to +70º C
Operating temperature	-10ºC to +70º C
Free of halogen	Yes
2011/65/EC RoHS	Fully compliant

Ordering information

Example	TA01	46	M	46	L	**O**	B	100	4	750	4	030M
Character		1	2	3	4	-	5	6	7	8	9	10

1. MPO type side A

44 = MPO PLUS 12 fiber Female (no pins)
45 = MPO PLUS APC 12 fiber Female (no pins) OS2 only
46 = MPO PLUS 12 fiber Male (pinned)
47 = MPO PLUS APC 12 fiber Male (pinned) OS2 only
64 = MPO PLUS 24 fiber Female (no pins)*
65 = MPO PLUS APC 24 fiber Female (no pins)* OS2 only
66 = MPO PLUS 24 fiber Male (pinned)*
67 = MPO PLUS APC 24 fiber Male (pinned)* OS2 only

2. MPO performance side A

L = Multimode Low Loss
M = Multimode Ultra Low Loss
S =Singlemode Low Loss
T = Singlemode Ultra Low Loss

3. MPO type side B

44 = MPO PLUS 12 fiber Female (no pins)
45 = MPO PLUS APC 12 fiber Female (no pins) OS2 only
46 = MPO PLUS 12 fiber Male (pinned)
47 = MPO PLUS APC 12 fiber Male (pinned) OS2 only
64 = MPO PLUS 24 fiber Female (no pins)*
65 = MPO PLUS APC 24 fiber Female (no pins)* OS2 only
66 = MPO PLUS 24 fiber Male (pinned)*
67 = MPO PLUS APC 24 fiber Male (pinned)* OS2 only

4. Cable jacket type

L = Low Smoke Zero Halogen
P = Plenum

5. Polarity type

A = Type A
B = Type B
C = Type C

6. Tail length (from secondary jacket to connector)

050 = 0.5 meter
100 = 1 meter (standard)

7. Fiber Type

Z = OS2 G657 (A.1/A.2) Corning SMF-28)
2 = OS2 G657 (A.2)
3 = Multimode OM3
4 = Multimode OM4

8. Total length in meters

010M = length 10 meters
050M = length 50 meters
100M = length 100 meters

Fiber Optic, Multi-Stranded Trunk Cable, **MPO-MPO**

Features and benefits

- Fiber-count 48 to 144 fibers
- Fast installation in 'zone applications'
- Bend-insensitive/bend optimized fibers
- Plenum (OFNP / FT6), LSZH Riser OFNR (FT-4-ST1)
- OS2, OM3 and OM4 performance types
- Colored outer-jacket to denote performance
- Ultra-low loss connector performance
- Suitable for routing in trays, racks and under raised floors
- Colored jacket for easy identification
- Compact 3mm strands for easy routing within racks and panels

Opterna trunk cables provide the backbone connection between UHD chassis and modules in the data center. Single stranded trunks offer a high degree of flexibility and scalability and Opterna offer these cables either with a single outer-jacket or with a secondary jacket which provides a higher degree of protection.

Opterna multi-stranded trunks provide an extremely fast and space-efficient solution for users who wish to deploy many fibers in a single cable rather than multiple single-stranded cables. Multi- stranded trunks are suitable for zone distribution applications such as EoR or MoR applications.

Multi-stranded cables offer a higher degree of protection within cable trays and basket but also maintain a high degree of cable flexibility within racks and panels due to the compact 3mm sub- strands.

Technical data

Mechanical data	Value	48	72	96	144
Design	mm	4 x 12	6 x 12	8 x 12	12 x 12
Sub-unit	mm	3.0mm ±0.1	3.0mm ±0.1	3.0mm ±0.1	3.0mm ±0.1
Sub-unit sheath thickness	mm	0.5	0.5	0.5	0.5
Outer sheath thickness	mm	1.4 nominal	1.4 nominal	1.4 nominal	1.4 nominal
Cable outer diameter	mm	10.3 ±0.5	12.2 ±0.5	14.1 ±0.5	18.1 ±0.5
Max installation tension	N	660			
Max. operation tension	N	200			
Min. bending radius without tension	mm	10 x cable Ø			
Min. bending radius under maximum tension	°C	20 x cable Ø			

Optical data	Value
Fiber category	OS2 - 9/125 bend insensitive OM3/4 bend-optimized
Channel IL (LL/Low Loss)	Single mode OS2 ≤1.5dB Multimode OM3/OM4 ≤0.70dB
Channel IL (ULL/Ultra Low Loss).	Single mode OS2 ≤0.70dB Multimode OM3/OM4 ≤0.50dB
Channel RL (Return Loss)	Singlemode OS2 UPC ≥ 50dB Singlemode OS2 APC ≥ 60dB Multimode OM3/OM4 ≥ 30dB

Environmental data

Description	Value
Operating temperature	-10ºC to +70º C
Free of halogen	Yes
2011/65/EC RoHS	Fully compliant

Ordering information

Example	T	A	04	44	M	44	L	**O**	B	100	4	030M
Character		1	2	3	4	5	6	-	7	8	9	10

1. Type of furcation

A = Neoprene sleeve (no protection sleeve)

B = Opterna branded housing (no furcation protection)

C = Opterna branded housing (no furcation protection)

2. Qty of MPO (each side)

04 = 4 x MPO

06 = 6 x MPO

08 = 8 x MPO

12 = 12 x MPO

3. MPO type side A (left side)

44 = MPO PLUS 12 fiber Female (no pins)

45 = MPO PLUS APC 12 fiber Female (no pins) OS2 only

46 = MPO PLUS 12 fiber Male (pinned)

47 = MPO PLUS APC 12 fiber Male (pinned) OS2 only

4. MPO performance side A (left side)

M = Multimode Ultra Low Loss (ULL)

S = Singlemode Standard

T = Singlemode Ultra Low Loss (ULL)

5. MPO type side B (right side)

See option 3

6. Cable jacket type

L = Low Smoke Zero Halogen

P = Plenum

7. Polarity type

A = Type A

B = Type B

C = Type C

8. Tail length (from secondary jacket to connector)

050 = 0.5 meter

100 = 1 meter (standard)

9. Fiber Type

Z = OS2 G657 (A.1/A.2) Corning SMF-28)

2 = OS2 G657 (A.2)

3 = Multimode OM3

4 = Multimode OM4

10. Total length in meters

010M = length 10 meters

050M = length 50 meters

100M = length 100 meters

"OPTERNA are able to offer alternative pre-terminated systems based on individual requirements. Please contact us for more support in this matter ...."

Fiber Optic, Jumpers, MPO to MPO

Features and benefits

- Fiber-count 12 and 24 fibers
- Suitable for 8 fiber SR4 deployments (12 fiber)
- Type B standard (other polarities available)
- Female – Female standard
- Compact 3mm diameter for easy routing
- Bend-insensitive/bend optimized fibers
- Plenum and LSZH jacket types
- OS2, OM3 and OM4 performance types
- Colored outer-jacket to denote performance
- Ultra-low loss connector performance

Opterna MPO/MTP patch cords provide the connection to equipment transceivers on switches or servers that use an MPO interface such as the QSFP (SR4). These patch cords can either be added to the end of a permanent structured cabling links or they can be used to connect two pieces of equipment directly.

MPO/MTP patch cords are supplied as standard with female connectors and a Type B polarity. This configuration is essential when connecting to male (pinned) transceivers not only from a gender perspective but also a transmit/receive functionality stand-point. Other configurations are available to suit legacy backbone cabling that requires a male (pinned) patch cord or a Type A polarity.

Technical data

Mechanical data	Value	12	24
Design	mm	1 x 12 bare fiber	1 x 24 bare fiber
Cable nominal diameter	mm	3.0mm ±0.2	3.6mm ±0.2
Max installation tension	N	200	440
Max. operation tension	N	66	132
Min. bending radius without tension	mm	10 x cable Ø	
Min. bending radius under maximum tension	ºC	20 x cable Ø	

Optical data	Value
Fiber category	OS2 - 9/125 bend insensitive OM3/4 bend-optimized
Channel IL (LL/Low Loss)	Single mode OS2 ≤1.5dB Multimode OM3/OM4 ≤0.70dB
Channel IL (ULL/Ultra Low Loss).	Single mode OS2 ≤0.70dB Multimode OM3/OM4 ≤0.50dB
Channel RL (Return Loss)	Singlemode OS2 APC ≥ 60dB Multimode OM3/OM4 ≥ 30dB

Environmental data

Description	Value
Installation	LSZH (-10º C to +60º C), PLENUM (0º C to +60º C)
Transport and storage	- 40º C to +70º C
Operation	LSZH (-20ºC to +70º C), PLENUM (0º C to +70º C)
Free of halogen	Yes
2011/65/EC RoHS	Fully compliant

Ordering information

Base-12, MPO to MPO Jumpers OS2 (A2), Type A, LSZH

Part number	Description
PC45S45L30A2**XXX**M	Base-12, Type-A, Female-Female, LSZH, OS2 (A2), Low Loss, xxx meters
PC45T45L30A2**XXX**M	Base-12, Type-A, Female-Female, LSZH, OS2 (A2), Ultra Low Loss, xxx meters
PC47S45L30A2**XXX**M	Base-12, Type-A, Male-Female, LSZH, OS2 (A2), Low Loss, xxx meters
PC47T45L30A2**XXX**M	Base-12, Type-A, Male-Female, LSZH, OS2 (A2), Ultra Low Loss, xxx meters
PC47S47L30A2**XXX**M	Base-12, Type-A, Male-Male, LSZH, OS2 (A2), Low Loss, xxx meters
PC47T47L30A2**XXX**M	Base-12, Type-A, Male-Male, LSZH, OS2 (A2), Ultra Low Loss, xxx meters

Base-12, MPO to MPO Jumpers OM3, Type A, LSZH

Part number	Description
PC44M44L30A3**XXX**M	Base-12, Type-A, Female-Female, LSZH, OM3, Ultra Low Loss, xxx meters
PC46M44L30A3**XXX**M	Base-12, Type-A, Male-Female, LSZH, OM3, Ultra Low Loss, xxx meters
PC46M46L30A3**XXX**M	Base-12, Type-A, Male-Male, LSZH, OM3, Ultra Low Loss, xxx meters

Base-12, MPO to MPO Jumpers OM4, Type A, LSZH

Part number	Description
PC44M44L30A4**XXX**M	Base-12, Type-A, Female-Female, LSZH, OM4, Ultra Low Loss, xxx meters
PC46M44L30A4**XXX**M	Base-12, Type-A, Male-Female, LSZH, OM4, Ultra Low Loss, xxx meters
PC46M46L30A4**XXX**M	Base-12, Type-A, Male-Male, LSZH, OM4, Ultra Low Loss, xxx meters

NOTE: Please pay attention to the way in which length of cable should be defined.

010M = length 10 meters
050M = length 50 meters
500M = length 50 meters

Fiber Optic, Jumpers, MPO to MPO

Ordering information

Base-12, MPO to MPO Jumpers OM3, Type B, LSZH

Part number	Description
PC44M44L30B3xxxM	Base-12, Type-B, Female-Female, LSZH, OM3, Ultra Low Loss, xxx meters
PC46M44L30B3xxxM	Base-12, Type-B, Male-Female, LSZH, OM3, Ultra Low Loss, xxx meters
PC46M46L30B3xxxM	Base-12, Type-B, Male-Male, LSZH, OM3, Ultra Low Loss, xxx meters

Base-12, MPO to MPO Jumpers OM4, Type B, LSZH

Part number	Description
PC44M44L30B4xxxM	Base-12, Type-B, Female-Female, LSZH, OM4, Ultra Low Loss, xxx meters
PC46M44L30B4xxxM	Base-12, Type-B, Male-Female, LSZH, OM4, Ultra Low Loss, xxx meters
PC46M46L30B4xxxM	Base-12, Type-B, Male-Male, LSZH, OM4, Ultra Low Loss, xxx meters

NOTE: Please pay attention to the way in which length of cable should be defined.

010M = length 10 meters
050M = length 50 meters
500M = length 50 meters

Ordering information

Base-24, MPO to MPO Jumpers OS2 (A2), Type A, LSZH

Part number	Description
PC65S65L36A2XXXM	Base-24, Type-A, Female-Female, LSZH, OS2 (A2), Low Loss, xxx meters
PC65T65L36A2XXXM	Base-24, Type-A, Female-Female, LSZH, OS2 (A2), Ultra Low Loss, xxx meters
PC67S65L36A2XXXM	Base-24, Type-A, Male-Female, LSZH, OS2 (A2), Low Loss, xxx meters
PC67T65L36A2XXXM	Base-24, Type-A, Male-Female, LSZH, OS2 (A2), Ultra Low Loss, xxx meters
PC67S67L36A2XXXM	Base-24, Type-A, Male-Male, LSZH, OS2 (A2), Low Loss, xxx meters
PC67T67L36A2XXXM	Base-24, Type-A, Male-Male, LSZH, OS2 (A2), Ultra Low Loss, xxx meters

Base-24, MPO to MPO Jumpers OM3, Type A, LSZH

Part number	Description
PC64M64L36A3XXXM	Base-24, Type-A, Female-Female, LSZH, OM3, Ultra Low Loss, xxx meters
PC66M64L36A3XXXM	Base-24, Type-A, Male-Female, LSZH, OM3, Ultra Low Loss, xxx meters
PC66M66L36A3XXXM	Base-24, Type-A, Male-Male, LSZH, OM3, Ultra Low Loss, xxx meters

Base-24, MPO to MPO Jumpers OM4, Type A, LSZH

Part number	Description
PC64M64L36A4XXXM	Base-24, Type-A, Female-Female, LSZH, OM4, Ultra Low Loss, xxx meters
PC66M64L36A4XXXM	Base-24, Type-A, Male-Female, LSZH, OM4, Ultra Low Loss, xxx meters
PC66M66L36A4XXXM	Base-24, Type-A, Male-Male, LSZH, OM4, Ultra Low Loss, xxx meters

NOTE: Please pay attention to the way in which length of cable should be defined.

010M = length 10 meters
050M = length 50 meters
500M = length 50 meters

Fiber Optic, Harness, UHD, **MPO to LC Uni-boot, (Polarity Switchable)**

Features and benefits

- Compact 3mm round cable (8/12 fiber)
- Compact 3.6mm round cable (24 fibers)
- Bend-insensitive/bend optimized fibers
- OS2, OM3 and OM4 performance types
- Color-coded shroud to denote performance
- Pulling tab for easy access to connectors in high-density environments
- Fast polarity reversal with unique rotating connector keys (subject to connector choice)
- Ultra-low loss performance

Opterna MPO-LC uni-boot harnesses provide fast and precise connections from patch panels to high-density servers and switches. The furcation housing is extremely compact and with a cable diameter of only 3mm, the single cord construction reduces cable consumption by as much as 50% compared to conventional figure '8' duplex cables. Harnesses can be supplied with straight tails or staggered tails to match the particular equipment and port numbering scheme on equipment.

An optional pulling tab at the rear of the connector provides unparalleled access to connectors, and allows users to make fast moves, adds and changes even in applications where LC ports are stacked directly adjacent to one another. Polarity reversal is also possible with the Opterna uni-boot connectors (TYPE 2) thanks to a simple locking trigger which allows the shroud to be pulled back and the connectors to be rotated 180º.

Technical data

Mechanical data	Value
Cable diameter	3.0mm/3.6mm (MPO side) and 2.0mm (LC uni-boot tail)
Durability	Min. 500 cycles

Fiber category	OS2 - 9/125 bend insensitive (A.1 or A.2) OM3/4 bend-optimized	
Test Wavelength (nm)	850nm (Multimode), 1550nm (Singlemode)	
IL Low Loss (LL)	Singlemode OS2 ≤1.0dB	Multimode OM3/OM4 ≤0.50dB
RL MPO/MTP (LL)	Singlemode OS2 APC ≥ 60dB	Multimode OM3/OM4 ≥ 30dB
IL Ultra Low Loss (ULL)	Singlemode OS2 ≤0.60dB	Multimode OM3/OM4 ≤0.35dB
RL MPO/MTP (ULL)	Singlemode OS2 APC ≥ 65dB	Multimode OM3/OM4 ≥ 30dB
RL (LC)	Singlemode OS2 UPC ≥ 55dB Multimode PC ≥ 30dB	Singlemode OS2 APC ≥ 65dB

Environmental data

Description	Value
Operating temperature	-10º to +70º
Free of halogen	Yes
2011/65/EC RoHS	Fully compliant

Technical drawing

Type 1 Straight tails

Type 2 Staggered tails of 15mm (1 shortest)

Type 3 Staggered of 15mm (1 longest)

Type 4 Staggered tails of 15mm (1 & 2 shortest)

Type 5 Staggered tails of 15mm (1 & 2 longest)

The different fan-out tail lengths are made to suit different types of switches and servers. The numbering on the tail relates to the port numbering on the equipment. The reason for changing the length and number of the tail is because sometimes the harness enters the switch from a different point (right, left, bottom or top). This has an impact on the number and the length of the tail.

NOTE: When connecting harnesses to Opterna UHD Modules, please use TYPE 1 tail with equal length.

Ordering information

Example	HA01	34	L	1E	E	L	NS	1	750	4	030M
Character		1	2	3	4	5	6	7	8	9	10

1. MPO type side A

34 = MPO PLUS 8 fiber Female (no pins)
35 = MPO PLUS APC 8 fiber Female (no pins)
36 = MPO PLUS 8 fiber Male (pinned)
37 = MPO PLUS APC 8 fiber Male (pinned)
44 = MPO PLUS 12 fiber Female (no pins)
45 = MPO PLUS APC 12 fiber Female (no pins)
46 = MPO PLUS12 fiber Male (pinned)
47 = MPO PLUSAPC 12 fiber Male (pinned)
64 = MPO PLUS 24 fiber Female (no pins)*
65 = MPO PLUS APC 24 fiber Female (no pins)*
66 = MPO PLUS 24 fiber Male (pinned)*
67 = MPO PLUS APC 24 fiber Male (pinned)*

2. MPO performance side A

L = Multimode Low Loss
M = Multimode Ultra Low Loss
S =Singlemode Low Loss
T = Singlemode Ultra Low Loss

3. Connector type side B

1K = LC UPC Uni-boot with Push-Pull tab, Polarity switchable
1L = LC APC Uni-boot with Push-Pull tab, Polarity switchable
1N = LC UPC Uni-boot with Standard tab, Polarity switchable
1O = LC APC Uni-boot with Standard tab, Polarity switchable

4. Performance side B

A = Singlemode APC
C = Singlemode UPC
D = Multimode Low Loss
E = Multimode Ultra Low Loss

5. Cable jacket type

L = Low Smoke Zero Halogen
P = Plenum

6. Polarity type

AS = Type A Straight
AF = Type A Flipped
NS = Type Neutral Straight
NF = Type Neutral Flipped

7. Furcation tail type

1 = Straight tails
2 = Staggered 15mm (1 shortest)
3 = Staggered 15mm (1 longest)
4 = Staggered 15mm (1 & 2 shortest)
5 = Staggered 15mm (1 & 2 longest)

8. Tail length (in mm) from front of housing

600 = 600mm standard (150mm shortest)

9. Fiber Type

Z = OS2 G657 (A.1 Corning SMF-28)
2 = OS2 G657 (A.2)
3 = Multimode OM3
4 = Multimode OM4

10. Length in meters including tail length

005M = length 0.5 meters
050M = length 5 meters
500M = length 50 meters

The furcation of the OPTERNA harness system is extremely compact so that the assembly does not block vital air-flow channels or impede access to critical switch connections.

The housing is stackable thanks to a slot-feature integrated into the housing. We can also group harnesses into pairs at the front of high-density switches and servers.

Fiber Optic, **MPO to MPO Conversion Harness**

Features and benefits

- Compact 3.6mm round cable (24 fiber)
- Converts Base-12 and Base-24 backbones
- Bend-insensitive/bend optimized fibers
- OS2, OM3 and OM4 performance types
- Can be used to connect switch ports directly
- Miniature furcation housing
- Provides easy upgrades to Base-8 transceiver ports for 40G, 100G and 200G
- Ultra-low loss performance

Conversion harnesses can either be used to to convert from one type of MPO connector to another, or they can be used as agreggation harnesses connecting different types of switch ports. Conversion harnesses are a low-loss alternative to conversion modules because they eliminate one mated MTP pair across the link.

Many of today's legacy infrastructures are built using a Base-12 backbone design, however history demonstrates that this fiber-count is never required on higher data rate switches or servers. Currently, 8 fibers is the preferred fiber-count for 40G (SR4) transceivers and this will remain the prefered choice for 100G, 200G, 400G and beyond. The MPO conversion harness allows users who have built their network with 12 fibers to convert to an 8 fiber or 24 fiber connector which matches the transceivers on their equipment. This conversion process can easily be achieved without wasting any of the fibers in the backbone cable.

Base-24 connectivity has emerged because of its deployment for 100G transceivers (SR10) using 2 x 10 lanes of fibers. However, transceivers with 20 fibers are decreasing in popularity as those transceivers with 8 fibers gradually increase. Conversion harnesses are available for users who still use SR10 transceivers, or for those who prefer to use a 24 fiber backbone because of its space-saving benefits.

Technical data

Mechanical data	Value
Cable diameter	3.6mm (24 fiber cable) and 3.0mm (8 and 12 fiber cable)
Durability	Min. 500 cycles

Channel loss	Value	
Fiber category	OS2 - 9/125 bend insensitive (A.1 or A.2) OM3/4 bend-optimized	
Test Wavelength (nm)	850nm (Multimode), 1550nm (Singlemode)	
MPO 8/12 IL Ultra Low Loss (ULL) per mated pair	Singlemode OS2 ≤0.70dB	Multimode OM3/OM4 ≤0.50dB
MPO 8/12 RL MPO/MTP (ULL) per mated pair	Singlemode OS2 APC ≥ 60dB	Multimode OM3/OM4 ≥ 35dB
MPO 24 IL Ultra Low Loss (ULL) per mated pair	Singlemode OS2 ≤0.70dB	Multimode OM3/OM4 ≤0.50dB
MPO 24 RL MPO/MTP (ULL) per mated pair	Singlemode OS2 APC ≥ 60dB	Multimode OM3/OM4 ≥ 35dB

Environmental data

Description	Value
Operating temperature	-10º to +70º
Free of halogen	Yes
2011/65/EC RoHS	Fully compliant

Ordering information

MPO to MPO Conversion Harness OS2 (A2), LSZH

Conversion harnesses OS2, Low Smoke Zero Halogen (LSZH)	
CHA0247T0337L10752xxxM	2 x MPO12 (Male) to 3 x MPO8 (Female), LSZH, OS2, straight tail 075cm, xxx meters
CHA0244T0337L10752xxxM	2 x MPO12 (Female) to 3 x MPO8 (Female), LSZH, OS2, straight tail 075cm, xxx meters
CHA0247T0165L10752xxxM	2 x MPO12 (Male) to 1 x MPO24 (Female), LSZH, OS2, tail 075cm, total length xxx meters
CHA0247T0165L10752xxxM	2 x MPO12 (Female) to 1 x MPO24 (Female), LSZH, OS2, tail 075cm, total length xxx meters
CHA0166T0337L10752xxxM	1 x MTP24 (Male) to 3 x MPO8 (Female), LSZH, OS2, tail 075cm, total length xxx meters
CHA0165T0337L10752xxxM	1 x MTP24 (Female) to 3 x MPO8 (Female), LSZH, OS2, tail 075cm, total length xxx meters

Note: xxx = Total cable length in meters including tails. 005M = 0.5 meters, 050M = 5.0 meters, 500M = 50.0 meters

MPO to MPO Conversion Harness OM3, LSZH

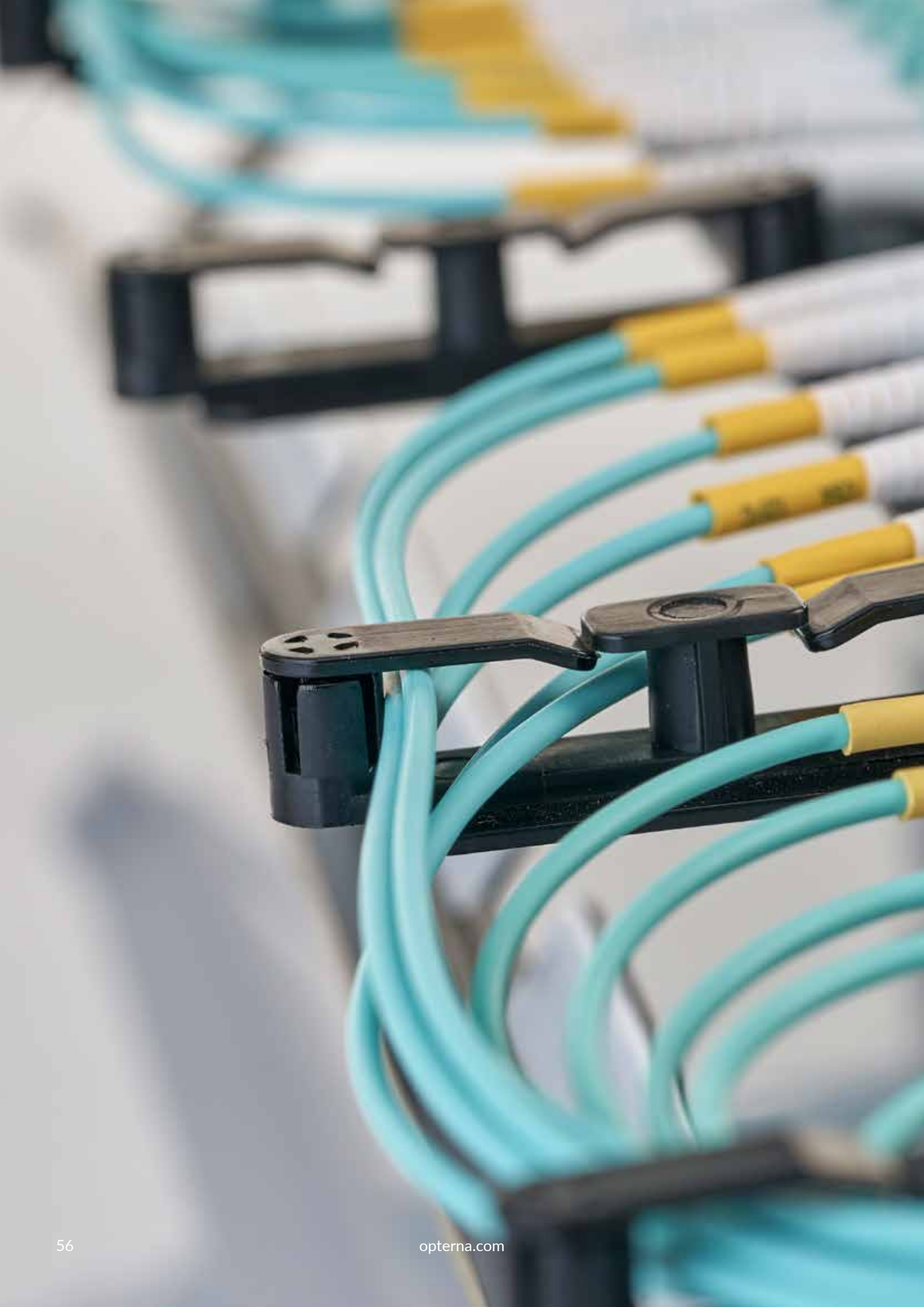
Conversion harnesses OM3, Low Smoke Zero Halogen (LSZH)	
CHA0246M0334L10753xxxM	2 x MPO12 (Male) to 3 x MPO8 (Female), LSZH, OM3, straight tail 075cm, xxx meters
CHA0244M0334L10753xxxM	2 x MPO12 (Female) to 3 x MPO8 (Female), LSZH, OM3, straight tail 075cm, xxx meters
CHA0246M0164L10753xxxM	2 x MPO12 (Male) to 1 x MPO24 (Female), LSZH, OM3, tail 075cm, total length xxx meters
CHA0244M0164L10753xxxM	2 x MPO12 (Female) to 1 x MPO24 (Female), LSZH, OM3, tail 075cm, total length xxx meters
CHA0166M0334L10753xxxM	1 x MTP24 (Male) to 3 x MPO8 (Female), LSZH, OM3, tail 075cm, total length xxx meters
CHA0164M0334L10753xxxM	1 x MTP24 (Female) to 3 x MPO8 (Female), LSZH, OM3, tail 075cm, total length xxx meters

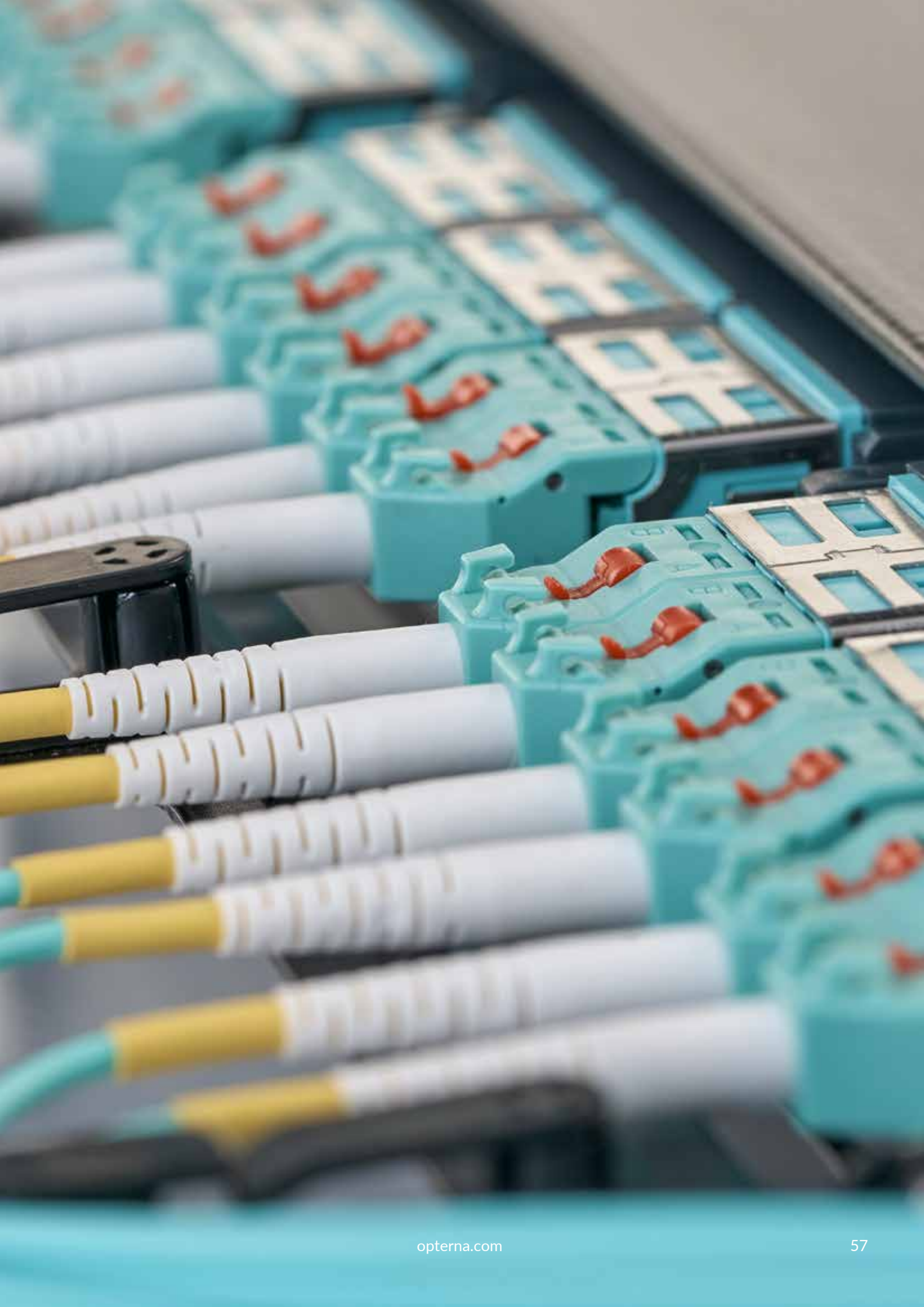
Note: xxx = Total cable length in meters including tails. 005M = 0.5 meters, 050M = 5.0 meters, 500M = 50.0 meters

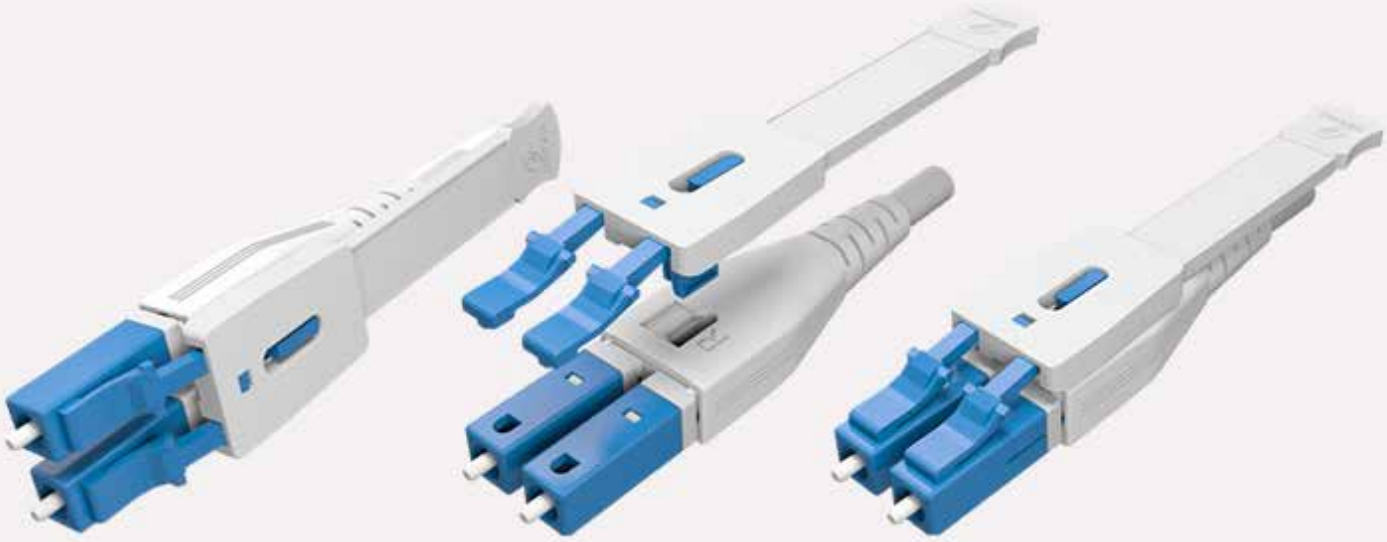
MPO to MPO Conversion Harness OM4, LSZH

Conversion harnesses OM4, Low Smoke Zero Halogen (LSZH)	
CHA0246M0334L10754xxxM	2 x MPO12 (Male) to 3 x MPO8 (Female), LSZH, OM4, straight tail 075cm, xxx meters
CHA0244M0334L10754xxxM	2 x MPO12 (Female) to 3 x MPO8 (Female), LSZH, OM4, straight tail 075cm, xxx meters
CHA0246M0164L10754xxxM	2 x MPO12 (Male) to 1 x MPO24 (Female), LSZH, OM4, tail 075cm, total length xxx meters
CHA0244M0164L10754xxxM	2 x MPO12 (Female) to 1 x MPO24 (Female), LSZH, OM4, tail 075cm, total length xxx meters
CHA0166M0334L10754xxxM	1 x MTP24 (Male) to 3 x MPO8 (Female), LSZH, OM4, tail 075cm, total length xxx meters
CHA0164M0334L10754xxxM	1 x MTP24 (Female) to 3 x MPO8 (Female), LSZH, OM4, tail 075cm, total length xxx meters

Note: xxx = Total cable length in meters including tails. 005M = 0.5 meters, 050M = 5.0 meters, 500M = 50.0 meters







LC Cable Assemblies

Ultra Low Loss LC Uni-boot assemblies that can be polarity switched in the field. A unique and innovative push-pull tab provides unparalled packing density and access when patched.

"These LC assemblies can be stacked directly adjacent to each other without any impact on access and speed of patching...."

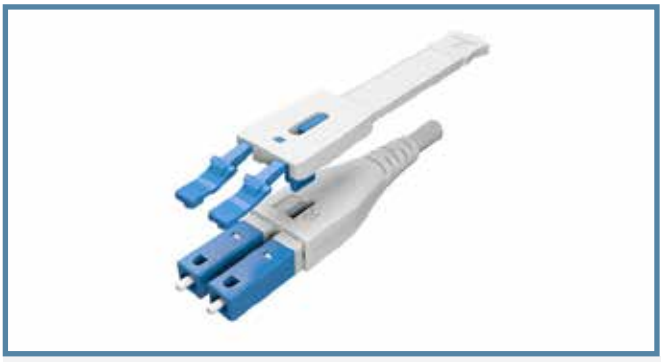
OPTERNA LC assemblies are provided with ultra-low-loss performance as standard, so that operators can extend the length of their optical links or alternatively add more hops across the link. As data rates increase, the optical loss budget decreases. OPTERNA want to provide operators with the same degree of flexibility that they enjoyed at lower data rates.

Each LC assembly is fitted with a special latch that can be removed and fitted to the opposite side of the connector. This allows the polarity to be changed in he field. We dont expect our customers to do this, but in large and diverse networks there is occasionally a need to make minor adjustments in the field.

LC Cable Assemblies

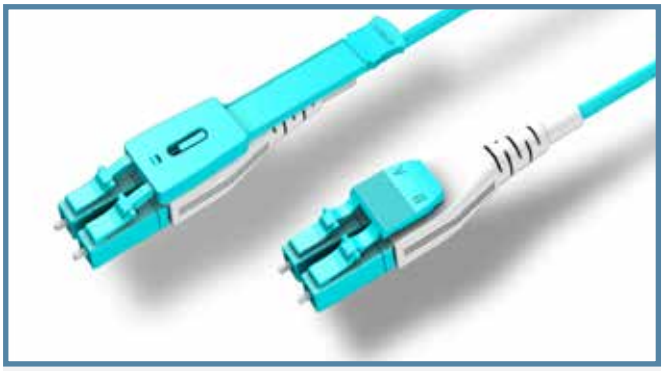
1 **Push-pull tab for fast, easy access**

Unbeatable access to connectivity even in areas with the highest packing density



2 **Polarity switchable in the field**

Easily remove latch of connector and fit to opposite side for polarity flip.

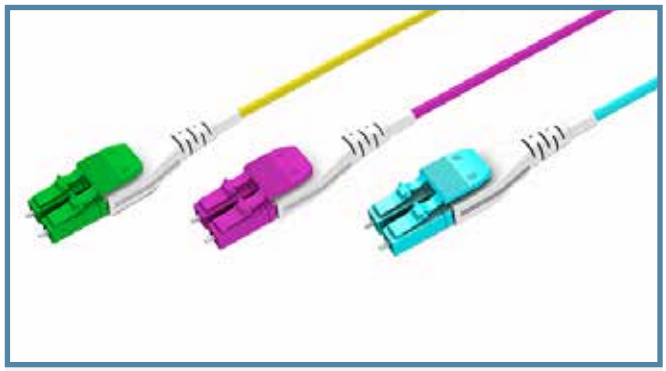


3 **Push-pull tab or standard latch**

LC's are available with or without push-pull tab depending on density requirements

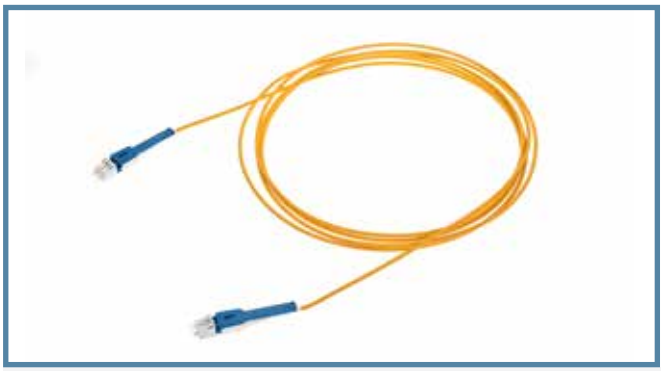
4 **Excellent labelling opportunity**

The flat surface of the pulling tab offers an excellent opportunity for identification



5 **Colours for easy identification**

Available in blue, green, aqua and heather violet depending on performance.

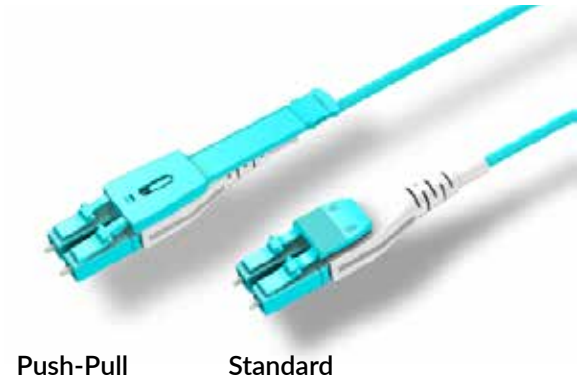


6 **Ultra Low loss performance**

Our ultra-low-loss assemblies support extended each at higher data rates.

Fiber Optic, Patch Cord, **Uni-boot LC, Polarity Switchable (Standard/Push-Pull)**

Features and benefits



Push-Pull **Standard**

- Compact 2mm round cable
- Bend-insensitive/bend optimized fibers
- OS2, OM3 and OM4 performance types
- Color-coded shroud to denote performance
- Pulling tab for easy access to connectors in high-density environments
- Fast polarity reversal with unique rotating latch (push-pull or standard)
- Ultra-low loss
- Low-profile housing design

Opterna LC Uni-boot patch cords are designed to reduce the cable congestion at the front of high-density patch panels and switches and reduce the time it takes to make routine MAC's (Moves, Adds and Changes). With a diameter of only 2mm, the single cord construction reduces cable consumption by as much as 50% compared to conventional figure '8' duplex cables.

A convenient pulling tab (option) at the rear of the connector provides unparalleled access to connectors, and allows users to disconnect assemblies even in applications where LC ports are stacked adjacent to one another. Polarity reversal is fast and simple with the Opterna uni-boot assemblies, thanks to a removable tab which can be fitted to the opposite side of the connector when rotated 180°.

Technical data

Mechanical data	Value
Cable diameter	2.0mm round
Durability	Min. 500 cycles

Channel loss	Value
Fiber category	OS2 - 9/125 bend insensitive (A.1 or A.2) OM3/4 bend-optimized
Test Wavelength (nm)	850nm (Multimode), 1550nm (Singlemode)
Insertion Loss (IL) max	Singlemode OS2 ≤0.25dB Multimode OM3/OM4 ≤0.20dB
Return Loss (RL) min.	Singlemode OS2 PC ≥ 55dB Singlemode OS2 APC ≥ 65dB Multimode OM3/OM4 ≥ 30dB

Environmental data

Description	Value
Operating temperature	-10° to +70°
Free of halogen	Yes
2011/65/EC RoHS	Fully compliant

Ordering information

LC Uni-boot Push-Pull, Polarity Switcheable Patch Cords, Polarity A-B/B-A, OS2 UPC (A2) LSZH

Part number	Description
PC1KC1KCL20AB2010M	LC UPC Uni-boot, push-pull, patch cord, OS2, LSZH, Polarity A-B/B-A, 1 meter
PC1KC1KCL20AB2020M	LC UPC Uni-boot, push-pull, patch cord, OS2, LSZH, Polarity A-B/B-A, 2 meters
PC1KC1KCL20AB2030M	LC UPC Uni-boot, push-pull, patch cord, OS2, LSZH, Polarity A-B/B-A, 3 meters
PC1EC1ECL20AB2**XXX**M	Other lengths please specify (**005** = 0.5 meters, **050** = 5.0 meters, **500** = 50 meters)

LC Uni-boot, Push-Pull, Patch Cords, Polarity A-B/B-A, OS2 APC (A2) LSZH

Part number	Description
PC1LA1LAL20AB2010M	LC APC Uni-boot, push-pull, patch cord, OS2, LSZH, Polarity A-B/B-A, 1 meter
PC1LA1LAL20AB2020M	LC APC Uni-boot, push-pull, patch cord, OS2, LSZH, Polarity A-B/B-A, 2 meters
PC1LA1LAL20AB2030M	LC APC Uni-boot, push-pull, patch cord, OS2, LSZH, Polarity A-B/B-A, 3 meters
PC1LA1LAL20AB2**XXX**M	Other lengths please specify (**005** = 0.5 meters, **050** = 5.0 meters, **500** = 50 meters)

NOTE: LC APC assemblies cannot be polarity switched in the field because they have an angled ferrule which requires a particular alignment

LC Uni-boot, Push-Pull, Polarity Switcheable Patch Cords, Polarity A-B/B-A, OM3 LSZH

Part number	Description
PC1KE1KEL20AB3010M	LC UPC Uni-boot, push-pull, patch cord, OM3, LSZH, Polarity A-B/B-A, 1 meter
PC1KE1KEL20AB3020M	LC UPC Uni-boot, push-pull, patch cord, OM3, LSZH, Polarity A-B/B-A, 2 meters
PC1KE1KEL20AB3030M	LC UPC Uni-boot, push-pull, patch cord, OM3, LSZH, Polarity A-B/B-A, 3 meters
PC1KE1KEL20AB3**XXX**M	Other lengths please specify (**005** = 0.5 meters, **050** = 5.0 meters, **500** = 50 meters)

LC Uni-boot, Push-Pull, Polarity Switcheable Patch Cords, Polarity A-B/B-A, OM4 LSZH

Part number	Description
PC1KE1KEL20AB4010M	LC UPC Uni-boot, push-pull, patch cord, OM4, LSZH, Polarity A-B/B-A, 1 meter
PC1KE1KEL20AB4020M	LC UPC Uni-boot, push-pull patch cord, OM4, LSZH, Polarity A-B/B-A, 2 meters
PC1KE1KEL20AB4030M	LC UPC Uni-boot, push-pull patch cord, OM4, LSZH, Polarity A-B/B-A, 3 meters
PC1KE1KEL20AB4**XXX**M	Other lengths please specify (**005** = 0.5 meters, **050** = 5.0 meters, **500** = 50 meters)

Fiber Optic, Patch Cord, **Uni-boot LC, Polarity Switchable (Standard)**

Ordering information

LC Uni-boot Standard, Polarity Switcheable Patch Cords, Polarity A-B/B-A, OS2 UPC (A2) LSZH

Part number	Description
PC1NC1NCL20AB2010M	LC UPC Uni-boot, standard, patch cord, OS2, LSZH, Polarity A-B/B-A, 1 meter
PC1NC1NCL20AB2020M	LC UPC Uni-boot, standard, patch cord, OS2, LSZH, Polarity A-B/B-A, 2 meters
PC1NC1NCL20AB2030M	LC UPC Uni-boot, standard, patch cord, OS2, LSZH, Polarity A-B/B-A, 3 meters
PC1NC1NCL20AB2**XXX**M	Other lengths please specify (**005** = 0.5 meters, **050** = 5.0 meters, **500** = 50 meters)

LC Uni-boot, Push-Pull, Patch Cords, Polarity A-B/B-A, OS2 APC (A2) LSZH

Part number	Description
PC1OA1OAL20AB2010M	LC APC Uni-boot, standard, patch cord, OS2, LSZH, Polarity A-B/B-A, 1 meter
PC1OA1OAL20AB2020M	LC APC Uni-boot, standard, patch cord, OS2, LSZH, Polarity A-B/B-A, 2 meters
PC1OA1OAL20AB2030M	LC APC Uni-boot, standard, patch cord, OS2, LSZH, Polarity A-B/B-A, 3 meters
PC1OA1OAL20AB2**XXX**M	Other lengths please specify (**005** = 0.5 meters, **050** = 5.0 meters, **500** = 50 meters)

NOTE: LC APC assemblies cannot be polarity switched in the field because they have an angled ferrule which requires a particular alignment

LC Uni-boot, Push-Pull, Polarity Switcheable Patch Cords, Polarity A-B/B-A, OM3 LSZH

Part number	Description
PC1NE1NEL20AB3010M	LC UPC Uni-boot, standard, patch cord, OM3, LSZH, Polarity A-B/B-A, 1 meter
PC1NE1NEL20AB3020M	LC UPC Uni-boot, standard, patch cord, OM3, LSZH, Polarity A-B/B-A, 2 meters
PC1NE1NEL20AB3030M	LC UPC Uni-boot, standard, patch cord, OM3, LSZH, Polarity A-B/B-A, 3 meters
PC1NE1NEL20AB3**XXX**M	Other lengths please specify (**005** = 0.5 meters, **050** = 5.0 meters, **500** = 50 meters)

LC Uni-boot, Push-Pull, Polarity Switcheable Patch Cords, Polarity A-B/B-A, OM4 LSZH

Part number	Description
PC1NE1NEL20AB4010M	LC UPC Uni-boot, standard, patch cord, OM4, LSZH, Polarity A-B/B-A, 1 meter
PC1NE1NEL20AB4020M	LC UPC Uni-boot, standard, patch cord, OM4, LSZH, Polarity A-B/B-A, 2 meters
PC1NE1NEL20AB4030M	LC UPC Uni-boot, standard, patch cord, OM4, LSZH, Polarity A-B/B-A, 3 meters
PC1NE1NEL20AB4**XXX**M	Other lengths please specify (**005** = 0.5 meters, **050** = 5.0 meters, **500** = 50 meters)

OPTERNA cable assemblies are optimised so that the insertion loss (IL) is as low as possible. This ultra-low-loss performance helps operators to maintain a high degree of flexibility across their links, without compromising signal integrity.

At higher data rates, the optical budget is greatly reduced and it is no longer possible to send data over the same distances. OPTERNA products provide extended reacheven at higher data rates.

Fiber Optic, **MPO Flexi Cleaner**

Features and benefits

- Fiber network panels and assemblies
- Outdoor FTTX applications
- Cable assembly production facilities
- Testing laboratories
- Servers, switches, routers and OADMS with MPO/MTP interface
- Easy pushing motion engages connector and initiates cleaner

The Opterna Fiber Optic FLEXI Cleaners are dry cloth cleaners specially designed to clean connections residing in an adapter, faceplate or bulkhead. The Opterna Fiber Optic Cleaners are simple to use and highly effective at removing oil and dust contaminants that can negatively impact optical performance.

Each cleaner has a reel of cleaning cloth that automatically rotates after each clean. This means that the optimum cleaning material is always available when it is needed.

Technical data

Mechanical data	Value
Material	Plastic
Compatible connectors	MPO and MTP connectors (plug & port)
Compatible end face	Compatible with flat and 8-degree angled end face with or without guide pins
Number of uses	>600 times
Size	205mm x 15mm x 51mm
Weight	45 grams

Standards

Testing should be carried out in accordance with IEC 62627

Ordering information

Description	**Part code**
MPO Flexi Cleaner for 600 cleaning cycles	MPO-FC-D-1

Fiber Optic, **LC Flexi Cleaner Refillable**

Features and benefits

- Fiber network panels and assemblies
- Outdoor FTTX applications
- Cable assembly production facilities
- Testing laboratories
- Servers, switches, routers and OADMS with LC interface
- Easy pushing motion engages connector and initiates cleaner

The Opterna Fiber Optic FLEXI Cleaners are dry cloth cleaners specially designed to clean connections residing in an adapter, faceplate or bulkhead.

The Opterna Fiber Optic Cleaners are simple to use and highly effective at removing oil and dust contaminants that can negatively impact optical performance.

Each cleaner has a reel of cleaning cloth that automatically rotates after each clean. This means that the optimum cleaning material is always available when it is needed.

Technical data

Mechanical data	Value
Material	Plastic
Compatible connectors	MPO and MTP connectors (plug & port)
Compatible end face	LC and MU connectors
Compatible end face	PC or APC
Number of uses	>750 times

Standards

Testing should be carried out in accordance with IEC 62627

Ordering information

Description	Part code
LC Flexi Cleaner for 750 cleaning cycles	LC-FC-R-1
LC Flexi Cleaner refill cartridges (3 x cartridges)	LC-FC-R-1-R3

Fiber Optic, **LC Flexi Cleaner Disposable**

Features and benefits

- Fiber network panels and assemblies
- Outdoor FTTX applications
- Cable assembly production facilities Testing laboratories
- Servers, switches, routers and OADMS with LC interface
- Easy pushing motion engages connector and initiates cleaner

The Opterna Fiber Optic FLEXI Cleaners are dry cloth cleaners specially designed to clean connections residing in an adapter, faceplate or bulkhead.

The Opterna Fiber Optic Cleaners are simple to use and highly effective at removing oil and dust contaminants that can negatively impact optical performance.

Each cleaner has a reel of cleaning cloth that automatically rotates after each clean. This means that the optimum cleaning material is always available when it is needed.

Technical data

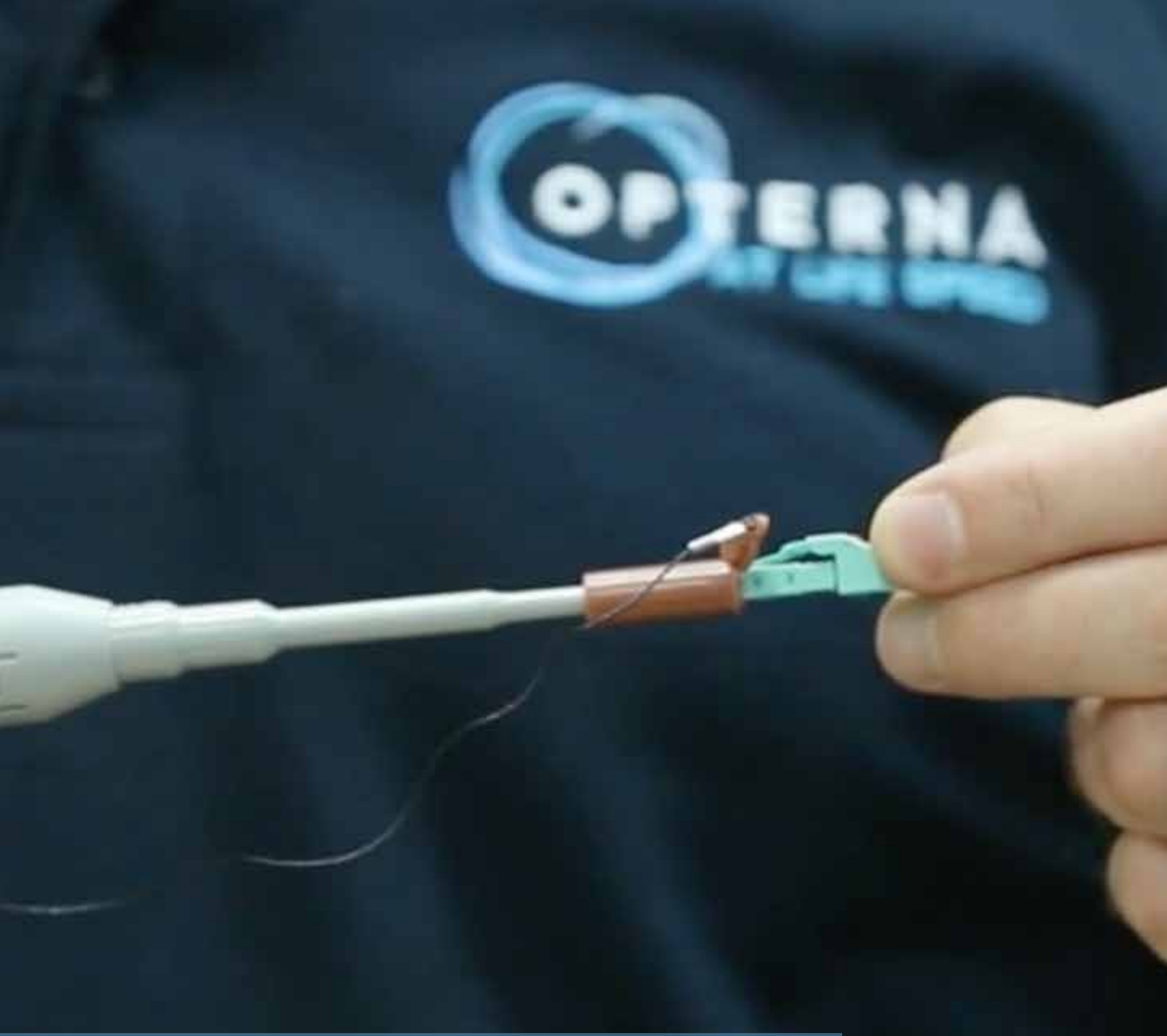
Mechanical data	Value
Material	Plastic
Compatible end face	LC and MU connectors
Compatible end face	PC or APC
Number of uses	>400 times

Standards

Testing should be carried out in accordance with IEC 62627

Ordering information

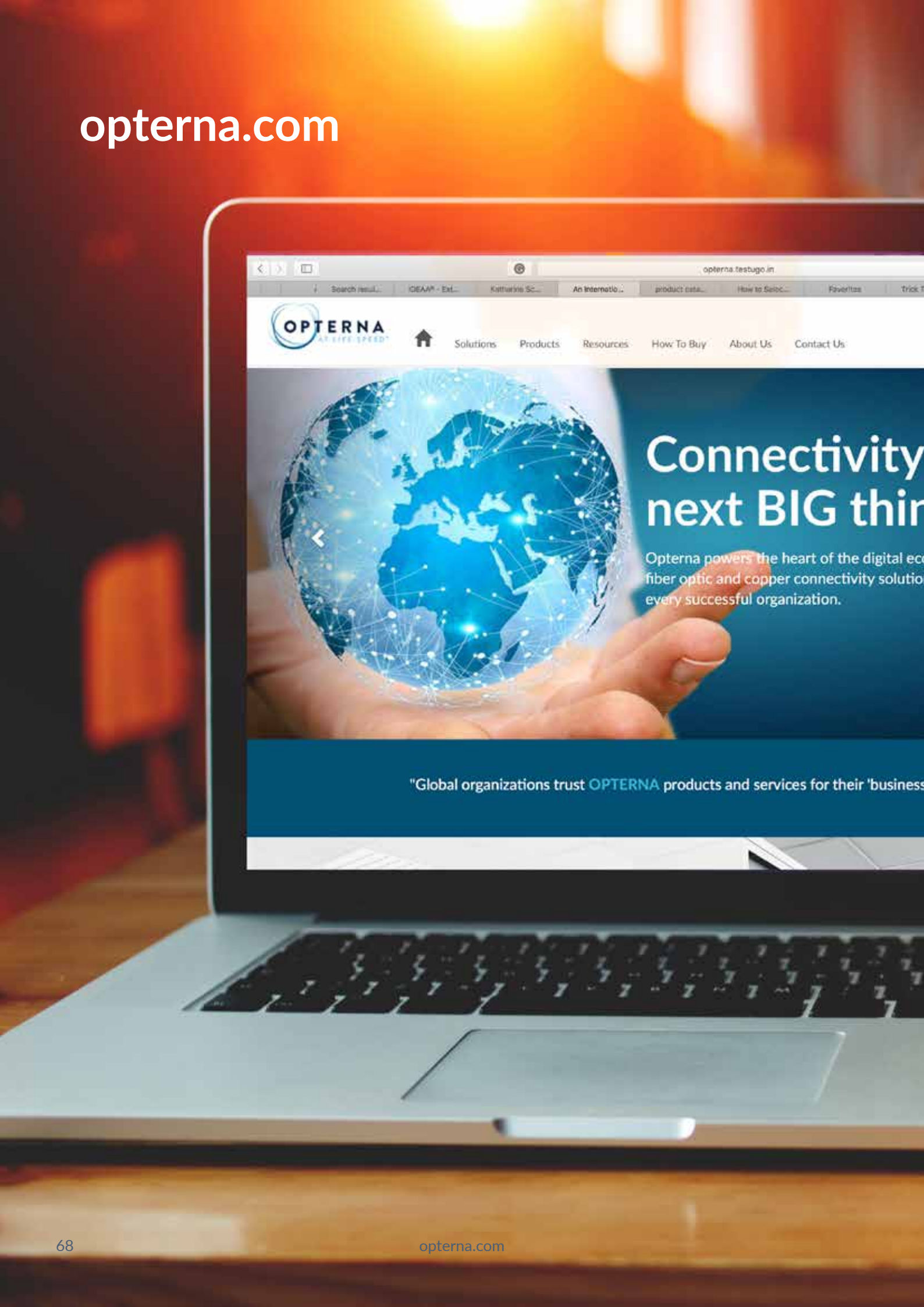
Description	Part code
LC Flexi Cleaner for 400 cleaning cycles	LC-FC-D-1



OPTERNA cleaners are extremely simple to use. Simply insert the connector into the front receptacle of the cleaner and push once. Each clean swipes a fresh ‘lint-free’ material over the end face of the fiber.

Cleaners are available for MPO multi-fiber connectivity or LC duplex and simplex connectivity.

opterna.com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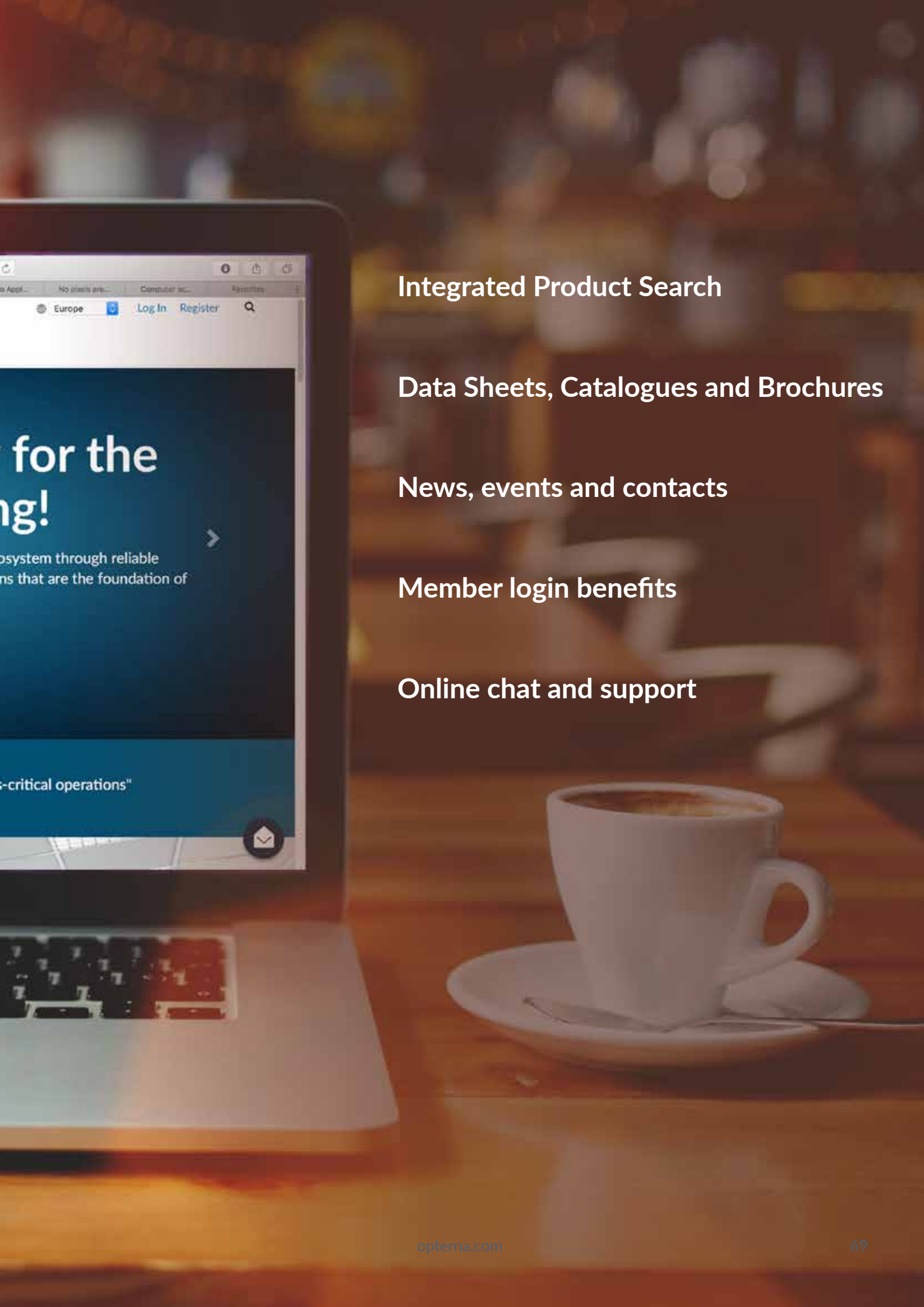

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