Structured Cabling Solutions

Edition 2017





Building next generation data centers





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Connecting The World



Connecting a Wide Range of Market Segments

HUBER+SUHNER provides high performance and innovative products and services for the rapidly evolving structured cabling solutions (SCS) market. We leverage over 25 years of experience in creating tailored connectivity solutions which deliver business-critical services safely and reliably. Our solutions are relevant regardless of the environment or application, and whenever there is a demand for quality, you can rely on us.

Colocation companies around the world rely on our high density fiber management systems to connect incoming carriers to their valued customers. Our excellent cost per port and structured cabling density make us the number one choice for regional and alobal colocation companies.	Colocation
Our high performance cable systems provide financial companies with the reliability they depend on to maintain their business-critical connections. Our exceptional cable management supporting high density SAN switches reduces cable clutter and virtually eliminates network latency.	Finance
Flexibility is key in the broadcast market and at HUBER+SUHNER, we pride ourselves in delivering customizable solutions that fit the specific needs of our customers. We are working with many of the world's largest broadcast companies who require the perfect combination of density, flexibility and speed.	Broadcast
HUBER+SUHNER has been supplying the telecom market since our inception. Our technologies are used in all areas of the network and we are the ideal supplier for companies moving towards a converged all IP infrastructure. We support the requirements from the leaguery network and we understand the challenging needs of the future	Telecom
The government sector requires reliability and traceability in every aspect of their business. Our products are designed in such a way as to negate installation errors and avoid costly or embarrassing issues during the lifetime of the network.	Government
Our combination of high-end copper and fiber optics solutions match perfectly to the demanding needs of hotels and casinos where signal availability is everything. Users can enjoy seamless signal quality from the moment they enter the property.	Hospitality
the demanding needs of hotels and casinos where signal availability is everything. Users can enjoy seamless signal quality from the moment they enter the property.	Hospitality

Global Presence, Local Support



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Swiss precision delivered worldwide

HUBER+SUHNER is a Swiss company which prides itself in honesty, fairness and social responsibility. Furthermore, HUBER+SUHNER embodies the values traditionally associated with Swiss engineering excellence – those of quality, precision, reliability and high-performance. Even though the needs of a global market cannot be fulfilled from a single location, those values best associated with Switzerland are embedded globally.

Worldwide manufacturing and assembly

HUBER+SUHNER operates manufacturing plants around the world which guarantees that regionalized requirements are met. On top of that, HUBER+SUHNER cooperates extensively with numerous third-party fiber optic assembly shops to extend the capacity and coverage of the HUBER+SUHNER brand. All of our assembly shops follow the same stringent processes and quality controls as our own group companies.



Worldwide distribution and support

Customers can rely on HUBER+SUHNER's worldwide sales and support network. Market proximity is the advantage of our global presence with 14 subsidiaries and representatives in over 60 countries. Our customers benefit from our strength to deliver local solutions and services tailored to their requirements and our global presence guaranteed best in class support in all regions.



Structured Cabling Solutions for Next Generation Data Centers





Fiber Optic Solutions





Fiber Optic Solutions

HUBER+SUHNER designs and manufactures industry leading cost effective fiber solutions supporting today's most advanced networks. Our solutions include all the fiber components needed to design and build a state of the art network. From field terminated connectors and modular cassettes to fiber pathways and factory terminated custom assemblies, this wide range of interchangeable solutions makes HUBER+SUHNER the best partner to help design your network.

Each network component is designed to meet or exceed all relevant standards. We have a full range of singlemode as well as multimode (OM3/OM4) solutions ready to help take your network into the future. Contact your local HUBER+SUHNER representative for more details on the products and solutions featured in this catalog.



LISA Cable Distribution Rack (CDR)

Highest density for evolving structured cabling solution markets

The LISA CDR (Leading Interconnect System Approach Cable Distribution Rack) is a high density fiber management rack which serves as a central cross-connect for network services. With a footprint depth of only 12 in, the LISA CDR is fully modular and scalable up to 1,620 ports (3,240 fibers) using LC connectivity and 1,080 ports (25,920 fibers) using MTP24 connectivity. Users can benefit from the C-shaped construction where all internal sub-elements are completely installable and accessible from the front. This important feature means that LISA CDRs can be placed back-to-back on a single floor tile or alternatively against a wall for minimal space consumption.

Configured to suit your needs

The LISA CDRs is 47U high, 12 in deep and comes in two standard width dimensions of 36 in and 48 in. The 36 in version is designed for splicing and MTP-LC transition trays and the 48 in version is intended for patching trays, whether it is LC or MTP cable system.

Key Features LISA CDR

C-shape design for easy patching and improved access

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The rigid C-shape design of the LISA CDR dramatically improves the access to connectivity when making moves, adds and changes. LISA CDR racks can be positioned side-by-side, and cables can be routed from one rack to the other without the need to feed patch cords behind vertical posts.

Integrated slack management of patch cords

Managing thousands of fibers in a single rack is virtually impossible without dedicated patch cord management. The LISA CDR rack is supplied with this feature, fully integrated from the start so that installers can safely route and manage patch cord slack every time they make a patch. Furthermore, the integrated management reduces the quantity of different length patch cords required to make connections. Only two different length cords are required to connect any of the ports within the same rack.

Clear identification and traceability

The second you walk up to a LISA rack you know that a great deal of time and investment has been spent on making this system visible. Fiber trays inside the rack are colored for immediate identification and clear labeling on the front of the fiber tray allows users to locate connections in seconds. These features help to reduce installation and maintenance as well as have a significant impact on the operational costs of the network.







LISA CDR Cable Distribution Rack



Characteristics

- Enhanced visual appearance
- C-shape for front and side access
- Highly stable and rigid construction
- Door locking repeatability
- Lightweight
- Luxurious look and feel
- Easy fitment and removal of doors and side panels
- Better utilized internal space
- Industry leading density

Technical data

Attribute		Value
Dimensions (W × L × H)		35.4 × 11.8 × 86.6 in / 47 U
Capacity		1,620 ports, 3,240 fibers using LC connectivity 1,080 ports, 25,920 fibers using MTP
Material	frame	aluminium extrusions, anodized colorless
	cover	metal sheet powder coated
Color		black all cover metal sheets, silver aluminium extrusions, internal metal parts
Ingress protection degree (EN60529)	IP3O
Temperature resistance (short-term)	Celsius	-46 to +120 °C
	Fahrenheit	-50 to +250 °F
Temperature resistance	Celsius	-46 to +81 °C
(long-term)	Fahrenheit	-50 to +178 °F
Flammability rating		UL 94V 0
UV resistance		resistant
Free of halogen		yes
Chemical resistance		good
RoHS requirements		fully compliant

LISA CDR Side Access Base Racks



Suitable for splicing and MTP-LC transition

Ordering information

Description	ltem no.
LISA CDR 36 rack black	
LISA CDR 36 in, with integrated patch cord management, perforated 24 in and 12 in wide doors, 47U, black	85029082

Description	ltem no.
LISA CDR 36 rack gray	
LISA CDR 36 in, with integrated patch cord management, perforated 24 in and 12 in wide doors, 47U, gray	85029085



Suitable for MTP-MTP and LC-LC patching

Description	Item no.
LISA CDR 48 rack black	
LISA CDR 36 in, with integrated patch cord management, perforated 24 in and 12 in wide doors, 47U, black	85029082
LISA CDR 12 in, with integrated patch cord management, perforated 12 in wide door, 47U, black	85029083

Description	ltem no.
LISA CDR 48 rack gray	
LISA CDR 36 in, with integrated patch cord management, perforated 24 in and 12 in wide doors, 47U, gray	85029085
LISA CDR 12 in, with integrated patch cord management, perforated 12 in wide door, 47U, gray	85029089

LISA Tray Units for MTP Transition Solution



Characteristics

- 19" rear-mounting for improved access to front
- Horizontal fiber tray mounting maximizes available height in rack
- Universal fixing plate for 2 conduits (splicing) or 3 MTP adapters (plug and play)
- Integral service loop for patch cords
- Horizontal and vertical patch cord guides
- Integrated patch cord mandrels for bend-radius protection
- Patch cord retaining ring ensures safe strain relief of patch cords exiting the unit

Technical data

Attribute	Value
Dimension (W × H × D)	2U: 20 × 10 × 3 in 6U: 20 × 10 × 10 in 7U: 20 × 10 × 12 in
Capacity	2 fiber trays per rack unit
Compatibility	LISA CDRs and LISA NGRs or to any rear mounted 19 in rail (e.g. street cabinet)
Material and Color	tray unit body: aluminum/steel – powder coated, black or gray mandrels at the front: ABS, black mandrels on the side: HDPE/PC, blue
Weight	2U: 5.5 lb 6U:16.7 lb 7U: 20.0 lb
Ingress protection degree (EN60529)	IP20
Resistance to impact (EN62262)	ІКОЗ
Bending radius	1.4 in
Temperature resistance (long term)	-40 to +70 °C (-40 to +158 °F)

LISA Tray Units for MTP Transition Solution



Ordering information

Description	ltem no.
gray	
2U tray unit for connecting up to 4 MTP transition fiber trays	85013618
6U tray unit for connecting up to 12 MTP transition fiber trays	85013616



Description	ltem no.
black	
2U tray unit for connecting up to 4 MTP transition fiber trays	84143144
7U tray unit for connecting up to 15 MTP transition fiber trays	85013562

LISA Tray Units for Patching Solution



Characteristics

- 19" rear-mounting for improved access to front
- Horizontal patching tray mounting maximizes available height in rack
- Allows instant access to patching tray and its connectivity due to sliding mechanism
- Integral service loop for patch cords
- Horizontal and vertical patch cord guides
- Integrated patch cord mandrels for bend-radius protection
- Patch cord retaining ring ensures safe strain relief of patch cords exiting the unit

Technical data

Attribute	Value
Dimension ($W \times H \times D$)	2U: 20 × 10 × 3 in 7U: 20 × 10 × 12 in
Capacitiy	2 patching trays per rack unit
Compatibility	LISA CDRs and LISA NGRs or to any rear mounted 19 in rail (e.g. street cabinet)
Material and Color	tray unit body: aluminum/steel – powder coated, black or gray mandrels at the front: ABS, black mandrels on the side: PC, blue
RoHS requirements	fully compliant
Weight	2U: 7.0 lb 7U: 25.3 lb
Ingress protection degree (EN60529)	IP20
Resistance to impact (EN62262)	IK03
Bend radius limitation	1.4 in
Temperature resistance (long term)	-40 to +70 °C (-40 to +158 °F)

LISA Tray Units for Patching Solution



Ordering information

Description	ltem no.
gray	
2U tray unit for connecting up to 4 patching fiber trays	85017844
7U tray unit for connecting up to 15 patching fiber trays	85017846



Description	ltem no.
black	
2U tray unit for connecting up to 4 patching fiber trays	85015635
7U tray unit for connecting up to 15 patching fiber trays	85017847



LISA CDR accessories enable simple, fast and secure installations. The accessory portfolio includes protection conduits for a bend-free guiding of loose tubes within a LISA CDR, but also components for easy documentation and identification of individual fiber trays. The assortment is completed with splice protectors and fixing hardware for controlled patch cord management.

Bend limitation conduits "solid"

Ordering information

Description	Packing unit	Order unit (mutiple of)	ltem no.	Picture
Black conduit, outer diameter 4.0 mm, inner diameter 2.6 mm, PBT-VO	100 m	100 m	84152202	
Black conduit, outer diameter 5.0 mm, inner diameter 3.3 mm, PBT-VO	100 m	100 m	84014502	
White conduit, outer diameter 5.0 mm, inner diameter 3.3 mm, PBT-VO	100 m	100 m	84147024	

Bend limitation conduits "slitted"

Ordering information

Description	Packing unit	Order unit (mutiple of)	ltem no.	Picture
Black conduit, outer diameter 4.0 mm, inner diameter 2.6 mm, PBT-VO	100 m	100 m	84088286	
Black conduit, outer diameter 5.0 mm, inner diameter 3.3 mm, PBT-VO	100 m	100 m	85017566	
White conduit, outer diameter 5.0 mm, inner diameter 3.3 mm, PBT-VO	100 m	100 m	85017565	

Calculation scheme for calculating single lengths of conduits within a LISA CDR

If the cable breakout area is located at the top of the rack, then read the schematic drawing from top to bottom. The total conduit length required for a LISA CDR36 side access is $150 \text{ m}^{(1)}$.



¹⁾ One conduit to each fiber tray. By using two conduits to each fiber tray, double conduit length is required

Conduit marking clip

Ordering information

Description	Packing unit	Order unit (mutiple of)	ltem no.	Picture
Clips for conduit labeling, 5 mm	300	1	84088287	

Tools

Ordering information

Description	Packing unit	Order unit (mutiple of)	ltem no.	Picture
Zipping tool for slitted conduits, 4 mm	1	1	85017225	
Zipping tool for slitted conduits, 5 mm	1]	84025983	C A

Fastening material

Description	Packing unit	Order unit (mutiple of)	ltem no.	Picture
Patch cord retaining ring, grips and strain relieves patch cords safely to tray units	100	100	84014507	
Velcro® strap, dimension (W × L) 0.6 × 1.0 in	82 ft	82 ft	84005451	
Velcro® tie with retaining slot, dimension (W × L) 0.3 × 7.9 in	100	100	84005803	-
Black rapstrap – flexible, strong, reusable and moulded cable strap, dimension (W × L) 10 × 12 in	48	48	85004339	05555555

Number labels – for numbering individual fiber trays

Ordering information

Description	Packing unit	Order unit (mutiple of)	ltem no.	Picture
Yellow label sheet, imprinted numbers from 1 to 100	1	1	84105982	
Aqua label sheet, imprinted numbers from 1 to 100	1	1	85015607	
Heather violet label sheet, imprinted numbers from 1 to 100	1	1	85015611	

Documentation

Description	Packing unit	Order unit (mutiple of)	ltem no.	Picture
Document holder 1U, gray	1	1	84018388	
Document holder 1U, black	1	1	84102916	



Ordering information

Description	ltem no.
LISA CDR, 36 in wide 2U routing channel, silver	85029682
LISA CDR, 12 in wide 2U routing channel, silver	85029837



Ordering information

Description	ltem no.
LISA CDR, 19 in breakout fixation plate for loose tube cables and conduits, gray	84085928
LISA CDR, protective cover for 19 in breakout plate, gray	84069169



Ordering information

Description	ltem no.
LISA CDR, 19 in breakout fixation plate for loose tube cables and conduits, black	84088572
LISA CDR, protective cover for 19 in breakout plate, black	84076533



Description	ltem no.
LISA CDR, fastening kit for raised computer floors incl. anchors, threaded-rod, nuts and washers	85029106
LISA CDR, fastening kit for solid concrete floors incl. anchor, nuts and washers	84091849



Ordering information

Description	ltem no.
LISA CDR, front mountable mandrel assembly incl. 2 divider plates and end cap, 5 piece set	85029681



Ordering information

Description	ltem no.
LISA CDR, patch cord guiding brackets for vertical divide plate, silver	85029918



Ordering information

Description	ltem no.
LISA CDR, patch cord guiding bracket for patch cord management plate, silver	85029919



Ordering information

Description	ltem no.
LISA CDR, conduit tie plate for extrusion, silver	85021672



Ordering information Description UISA CDR, vertical cable bracket for extrusion, silver 85021673



LISA Next Generation Rack (NGR)

Designed in collaboration with installers and operators, the LISA NGR incorporates many features not possible when using conventional 19" cabinets and splicing panels. For example, the NGR is only 12 in deep and its C-shape design allows unrestricted access to all internal elements from the front. This not only reduces installation and servicing time, but offers customers the opportunity to position LISA NGRs back-to-back for double density within a 24 in standard footprint. In addition, the C-shape design also allows cables to be patched from the LISA NGR directly to adjacent switch equipment without the need to enter the raised floor space or overhead pathway system. This reduces CAPEX and OPEX especially in smaller installations.

The LISA NGR is configured using modular and scalable LISA tray units. This building block approach offers maximum flexibility and scalability enabling the customer to add additional fiber capacity within the same rack as they grow. Termination modules support all connectivity types and offer a wide array of applications in a single generic footprint so that one product covers all existing and future customer requirements.

LISA NGR - Base Rack



Characteristics

- C-shape base rack with rear-mounted rails for excellent front access
- Patch cord routing without external ducts to adjoining racks
- Lateral and backside mounting of further racks
- Cable mounting plates and cable brackets for fixing cables or loose-tubes
- Fast and easy installation or removal of side walls, back walls and doors with spring bolts
- Robust steel construction
- Convenient patch cord management with generous storage possibilities
- Leveling with height adjustable feet
- Vertical rear fixing hole standard 19"
- Grounding and bonding of all parts to the base rack
- Termination of up to 1920 fibers
- Intelligent variants for storing, routing and cross-connecting fiber optic patch cords
- Integrated bend radius limiter: 1.4 in for fibers and patch cords, 1.8 in for loose-tubes

The LISA NGR was designed as an open C-shaped frame for managing passive optical components. With a standard height of 90 in, the LISA NGR has a capacity of 1920 fibers using telescopic fiber tray units. Specific installations such as the break-out termination unit (BTU900) or the customer termination shelf (CTS) allows optimal expansion to all known network conditions. An integrated, easy-access patch cord management facilitates patch cord over length within the LISA NGR.

Due to its compact dimensions of 12 x 35 x 90 in, this distribution frame excels in applications where small to medium-sized fiber density is required, such as FTTH POP stations. Because of its flexible C-shape design, scaling up the NGR to higher densities can be achieved by side-by-side mounting.

Description	Item no.
LISA NGR 36 in, patch cord management, back wall, solid 24 in and 12 in wide doors, 46U, gray	85088557
LISA NGR 36 in, patch cord management, back wall, no doors, 46U, gray	85088555
LISA NGR 36 in, patch cord management, back wall, solid 24 in and 12 in wide doors, 46U, black	
LISA NGR 36 in, patch cord management, back wall, no doors, 46U, black	85093289

LISA NGR – Microduct Management



Characteristics

- Robust steel construction
- High microduct density per footprint without compromising performance, reliability and ease of maintenance
- For termination of up to 216 microducts
- C-shape base rack with rear-mounted microduct fixing device for excellent front access
- Fast and easy installation or removal of side walls, back walls and doors with spring bolts
- Front-mounted microduct management
- Leveling with height adjustable feet
- Grounding and bonding of all parts to the base rack
- Extensive microduct management
- Microduct entry from top or bottom
- Secure strain-relief with an easy adaptive fixing device
- Water and gas blocker devices available

Description	ltem no.
LISA NGR 12 in, no side panel, microduct management, solid 12 in wide door, 46U, gray	85032247
LISA NGR 12 in, microduct management, back wall, no doors, 46U, gray	85032248
LISA NGR 12 in, microduct management, back wall, no doors, 46U, black	85093284
LISA NGR 12 in, no side panel, microduct management, solid 12 in wide door, 46U, black	85093287

Tray Units for MTP Transition Solution



Characteristics

- 19" rear-mounting for improved access to front
- Horizontal fiber tray mounting maximizes available height in rack
- Universal fixing plate for 2 conduits (splicing) or 3 MTP adapters (plug and play)
- Integral service loop for patch cords
- Horizontal and vertical patch cord guides
- Integrated patch cord mandrels for bend-radius protection
- Patch cord retaining ring ensures safe strain relief of patch cords exiting the unit

Technical data

Attribute	Value
Dimension (W \times H \times D)	2U: 20 × 10 × 3 in 6U: 20 × 10 × 10 in 7U: 20 × 10 × 12 in
Capacity	2 fiber trays per rack unit
Compatibility	LISA NGRs and LISA CDRs or to any rear mounted 19 in rail (e.g. street cabinet)
Material and Color	tray unit body: aluminum/steel – powder coated, black or gray mandrels at the front: ABS, black mandrels on the side: HDPE/PC, blue
Weight	2U: 5.5 lb 6U: 16.7 lb 7U: 20.0 lb
Ingress protection degree (EN60529)	IP20
Resistance to impact (EN62262)	IK03
Bending radius	1.4 in
Temperature resistance (long term)	-40 to +70 °C (-40 to +158 °F)

LISA Tray Units for MTP Transition Solution



Ordering information

Description	
black	
2U tray unit for connecting up to 4 MTP transition fiber trays	84143144
7U tray unit for connecting up to 15 MTP transition fiber trays	85013562



Description	ltem no.
gray	
2U tray unit for connecting up to 4 MTP transition fiber trays	85013618
6U tray unit for connecting up to 12 MTP transition fiber trays	85013616

LISA Tray Units for Patching Solution



Characteristics

- 19" rear-mounting for improved access to front
- Horizontal patching tray mounting maximizes available height in rack
- Allows instant access to patching tray and its connectivity due to runner mechanism
- Integral service loop for patch cords
- Horizontal and vertical patch cord guides
- Integrated patch cord mandrels for bend-radius protection
- Patch cord retaining ring ensures safe strain relief of patch cords exiting the unit

Technical data

Attribute	Value
Dimension (W \times H \times D)	2U: 20 × 10 × 3 in 7U: 20 × 10 × 12 in
Capacitiy	2 patching trays per rack unit
Compatibility	LISA NGRs, LISA CDRS and any rear mounted 19 in rail (e.g. street cabinet)
Material and Color	tray unit body: aluminum/steel – powder coated, black or gray mandrels at the front: ABS, black mandrels on the side: PC, blue
RoHS requirements	fully compliant
Weight	2U: 7.0 lb 7U: 25.3 lb
Ingress protection degree (EN60529)	IP20
Resistance to impact (EN62262)	ІКОЗ
Bend radius limitation	1.4 in
Temperature resistance (long term)	-40 to +70 °C (-40 to +158 °F)

LISA Tray Units for Patching Solution

Patching tray unit



Ordering information

Description	ltem no.
gray	
2U tray unit for connecting up to 4 patching fiber trays	85017844
7U tray unit for connecting up to 15 patching fiber trays	85017846



Description	
black	
2U tray unit for connecting up to 4 patching fiber trays	85015635
7U tray unit for connecting up to 15 patching fiber trays	



LISA NGR accessories enable simple, fast and secure installations. The accessory portfolio includes protection conduits for a bend-free guiding of loose tubes within a LISA NGR, but also components for easy documentation and identification of individual fiber trays. The assortment is completed with splice protectors and fixing hardware for controlled patch cord management.

Description	PU	Item no.	Picture
LISA NGR door 12 in with handle, hinged right, without lock, installation material and packaging included, gray	1	85003858	
LISA NGR door 12 in with handle, hinged left, without lock, installation material and packaging included, gray	1	85003866	
LISA NGR door 12 in with handle, hinged right, without lock, installation material and packaging included, black	1	85003859	
LISA NGR door 12 in with handle, hinged left, without lock, installation material and packaging included, black	1	85003867	
LISA NGR door 24 in with handle, hinged right, without lock, installation material and packaging included, gray	1	85003854	
LISA NGR door 24 in with handle, hinged left, without lock, installation material and packaging included, gray	1	85003862	
LISA NGR door 24 in with handle, hinged right, without lock, installation material and packaging included, black	1	85003855	
LISA NGR door 24 in with handle, hinged left, without lock, installation material and packaging included, black	1	85003863	

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LISA NGR side wall, 86.6 in, installation material and packaging included, gray	1	84068179	
LISA NGR side wall, 86.6 in, installation material and packaging included, black	1	84076464	
LISA NGR, 19 in breakout fixation plate for loose tube cables and conduits, gray	1	84085928	annonustionnon ann ann ann ann ann ann ann ann an
LISA NGR, protective cover for 19 in breakout plate, gray	1	84069169	~
LISA NGR, 19 in breakout fixation plate for loose tube cables and conduits, black	1	84088572	9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9
LISA NGR, protective cover for 19 in breakout plate, black	1	84076533	
LISA NGR patch cord routing channel 12 in, 5U, mounting material included, gray	1	84077066	
LISA NGR patch cord routing channel 12 in, 5U, mounting material included, black	1	84077067	

Description	PU	Item no.	Picture
LISA NGR cable retainer, small, mounting material included, gray	1	84068200	
LISA NGR cable retainer, small, mounting material included, black	1	84076535	
LISA NGR cable bracket, mounting material included, gray	1	84068201	Concentration of the second se
LISA NGR cable bracket, mounting material included, black	1	84076534	
Cable guide 1U, mounting material included, gray and blue	1	84093679	
Cable guide 1U, mounting material included, black and blue	1	84093678	
LISA NGR door looking upgrade with 1 key, black	1	84085188	0 9
LISA NGR door looking key, black	1	84085514	
LISA NGR Accessories

LISA NGR 12 in top cover, installation material and packaging included, gray	1	84076429	
NGR 24 in top cover, installation material and packaging included, gray	1	84076430	
LISA NGR 36 in top cover, installation material and packaging included, gray	1	84076431	
LISA NGR 12 in brush stripes, installation material and packaging included, gray	1	84068214	
LISA NGR 24 in brush stripes, installation material and packaging included, gray	1	84068211	
LISA NGR 36 in brush stripes, installation material and packaging included, gray	1	84068022	
Rack distance to mount cable mounting 2-end plate, installation material and packaging included, gray	2	84021461	
LISA NGR baying kit, positioned side-by-side or back-to-back	1	84076448	
LISA NGR wall fixing kit	1	84071885	A STATE
Cross connect unit 6U high gray	1	84004196	
Cross connect unit 6U high black]	84087997	



Structured Cabling Solutions for 19" Equipment Cabinets

Structured Cabling Solutions (SCS) are critical to the operations of today's networks. HUBER+SUHNER offers a comprehensive portfolio of SCS solutions for 19" cabinets. This portfolio includes first-class cross-connect solutions (LISA), a modular top of rack solution (IANOS) and high density multi-technology panels (ZDPHD). These solutions enable network operators the ability to execute quick move, adds and changes (MACs) as well as provides network flexibility which also reduces operational costs (OPEX).

LISA – a leading side access cross-connect solution guarantees a smooth implementation of structured cabling solutions to your network. The different colors and the extremely visible port identification ensures that MACs are made quickly and accuratly every time.

IANOS – a new top of rack solution that allows mixed data rates and applications in one modular panel. This high degree of flexibility provides you a better return of investment (RoI) and higher utilization of your assets. Upgrades to higher data rates are made simple and safe reducing the time of MACs which can contribute to a lower total cost of ownership (TCO).

Structured Cabling Solutions for 19" Equipment Cabinets

Optimized Distribution Unit (ODU)

The optimized distribution unit (ODU) allows the integration of any LISA fiber tray into a standard 19" equipment cabinet. The ODU has a lockable steel door which provides security to the internal connections.

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IANOS

IANOS chassis are high density scalable sub-racks designed to accommodate the next generation of data transmissions in rapidly evolving structured cabling systems. Available in 1U or 4U increments, the IANOS chassis delivers industry leading density and best in class handling across almost every application be it splicing, pre-terminated cables or direct patching.

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IANOS lite

The IANOS lite chassis is designed to provide easy handling and a fast and complete access to the connectors. The unique design also allows installers easy access from the back and the front of the IANOS lite chassis when installing fibers.

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Fiberframe / Fiberframe lite

Both Fiberframe and Fiberframe Lite, are 19" panels which allow the user to splice or patch various cable systems in a standard 1U 19" frame. The Fiberframe is a lightweight aluminium construction, while Fiberframe Lite is a solid steel construction.

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High Density Zone Distribution Panel (ZDPHD)

The high density zone distribution panel can accommodate up to four high density MTP modules (MTHDM), four high density universal adapter plates (HDUAP) or two RJ-45 modules in a single 1U space (unused spaces can be fitted with blanking plates) and is normally positioned at the top of server or switch cabinets.

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Optimized Distribution Unit (ODU)

Within the LISA side access portfolio, HUBER+SUHNER offers a sub-rack which allows the integration of any LISA fiber tray into a standard 19" equipment cabinet. Flexible mounting options at the rear of the optimized distribution unit (ODU) make cable fixation quick and easy. Bend-limiting conduits give ultimate protection to the incoming fibers. Patch cords are routed to the front of the ODU and can either be guided to the rear of the cabinet (around the vertical rail) or vertically (along the front of the rail if sufficient side space is available within the cabinet).

The ODU has a lockable steel door which provides security to the internal connections. This feature is particularly beneficial in collocation areas where multiple subscribers occupy the same rack space.

ODU - Optimized Distribution Unit



Characteristics

- Integration of LISA fiber trays supporting splicing solution or LISA MTP transition solution
- Front mounting allows the use in standard 19" equipment cabinets
- Each rack unit accommodates 2 LISA fiber trays
- Allows instant access to fiber trays and its connectivity
- Integral service loop for patch cords
- Horizontal and vertical patch cord guides
- Integrated patch cord mandrels for bend-radius protection
- Patch cord retaining ring ensures safe strain relief of patch cords exiting the unit
- Lockable front door offer complete access security

Technical data

Attribute	Value
Dimension (W \times H \times D)	1U: 20.3 × 12.2 × 1.7 in 2U: 20.3 × 12.2 × 3.5 in 3U: 20.3 × 12.2 × 5.2 in
Capacity	2 fiber trays per rack unit
Compatibility	to any front mounted 19 in rail (e.g. network equipment racks)
Material	tray unit body: aluminum/steel – powder coated, black or gray mandrels at the front: ABS, black mandrels on the side: HDPE, blue
RoHS requirements	fully compliant
Weight	1U: 6.6 lb 2U: 9.9 lb 3U: 13.2 lb
Ingress protection degree (EN60529)	IP20
Resistance to impact (EN62262)	IK03
Bending radius	1.4 in
Temperature resistance (long term)	-40 to +70 °C (-40 to +158 °F)

ODU – for Splicing or Splitting Fiber Trays



Characteristics

- Up to 4 conduits per fiber tray
- With conduit spaces on the rear
- Gray Color

Ordering information

Description	ltem no.
1U ODU for splicing up to 2 fiber trays	84076616
2U ODU for splicing up to 4 fiber trays	84076597
3U ODU for splicing up to 6 fiber trays	84076598

ODU – for MTP Transition Fiber Trays



Characteristics

- Universal fixing plate for up to 3 MTP adapters (plug and play)
- or 2 conduits (splicing) per fiber tray
- Black Color

Description	ltem no.
1U ODU for connecting up to 2 MTP transition fiber trays	84138128
2U ODU for connecting up to 4 MTP transition fiber trays	84138122
3U ODU for connecting up to 6 MTP transition fiber trays	84138119

ODU Accessories

Fastening material

Ordering information

Description	Packing unit	Order unit (mutiple of)	ltem no.	Picture
Patch cord retaining ring, grips and strain relieves patch cords safely to tray units	100	100	84014507	
Velcro [®] strap, dimension (W × L) 0.6 × 1.0 in	25	25	84005451	
Velcro® tie with retaining slot, dimension (W × L) 0.3 × 7.9 in	100	100	84005803	-
Black rapstrap – flexible, strong, reusable and moulded cable strap, dimension (W × L) 10 × 12 in	48	48	85004339	SECOND

Number labels – for numbering individual fiber trays

Ordering information

Description	Packing unit	Order unit (mutiple of)	ltem no.	Picture
Yellow label sheet, imprinted numbers from 1 to 100	1	1	84105982	
Aqua label sheet, imprinted numbers from 1 to 100	1	1	85015607	
Heather violet label sheet, imprinted numbers from 1 to 100	1	1	85015611	

Extension brackets

Description	Packing unit	Order unit (mutiple of)	ltem no.	Picture
3U sized bracket to mount 19" tray units into a 21" rack, gray	1	1	84091367	Constant of the second

ODU Accessories

ODU wall-mount kit

Ordering information

Description	Packing unit	Order unit (mutiple of)	ltem no.	Picture
Gray fastening kit to mount a 3U sized ODU onto a wall	1	1	85002364	1

Splice protectors

Ordering information

Description	Packing unit	Order unit (mutiple of)	ltem no.	Picture
Heat shrink splice protector, dimension: 1.5 × 40 mm	100	100	84059763	//
Heat shrink splice protector, dimension: 2.4×45 mm	100	100	84005214	//
Heat shrink splice protector, dimension: 2.4 × 60 mm	100	100	84005215	
Sandwich splice protector, dimension: 1.2 × 3.2 × 30 mm	150	150	23218558	11

Bend-limitation conduits

Description	Packing unit	Order unit (mutiple of)	ltem no.	Picture
White conduit, outer diameter 5.0 mm, inner diameter 3.3 mm, PBT-VO, solid	100 m	100 m	84147024	\frown
Black conduit, outer diameter 5.0 mm, inner diameter 3.3 mm, PBT-VO, solid	100 m	100 m	84014502	
White conduit, outer diameter 5.0 mm, inner diameter 3.3 mm, PBT-VO, slitted	100 m	100 m	85017565	
Black conduit, outer diameter 5.0 mm, inner diameter 3.3 mm, PBT-VO, slitted	100 m	100 m	85017566	

ODU Accessories

Tools

Ordering information

Description	Packing unit	Order unit (mutiple of)	ltem no.	Picture
Zipping tool for slitted conduits, 5 mm	1	1	84025983	Carlo Carlo

Patch cord routing

Description	ltem no.	Picture
Patch cord routing element mounted on BTUs or front access sub-racks, guiding patch cords to the right side with an angle of 45°	84072036	5
Patch cord routing element mounted on BTUs or front access sub-racks, guiding patch cords to the left side with an angle of 45°	84072037	



Leading Interconnect System Approach (LISA) Fiber Trays

LISA fiber trays are the side-facing connectivity blocks that are inserted into tray units within the high density LISA CDR, NGR, or ODU systems. Designed for speed of installation and improved accessibility, LISA fiber trays can be installed and removed in under 10 seconds.

Fiber trays are available to cover a wide range of applications including splicing , patching, and fiber connector transitions. Within the network services, the majority of splicing applications are singlemode LC because this combination provides a future-proofed infrastructure.

MTP-LC transitions on the other hand are generally multimode OM3 or OM4, allowing the operator to reuse the MTP backbone and upgrade it later to parallel optics including 40G and 100G.

In addition to the splicing and transition fiber trays, HUBER+SUHNER also offer a patching fiber tray which is designed to serve the increasing trend towards MTP parallel optic applications. The patching tray is also suitable for singlemode LC patching in applications where fast, factory tested links are required.

Key Features Fiber Trays

100 % accessibility from front

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The LISA tray unit allows incoming cables and outgoing patch cords to be fully installed and serviced from the front or side without the need to access the rear of the cabinet. Integrated slack storage areas allow fiber trays to be slid in and out of the tray unit in just a few seconds without disrupting pre-installed fibers.



Splicing fiber trays and transition trays can be mixed together in the same centralized cross-connect rack due to the universal fixing plate on the side of the tray unit. This is a great feature for operators who have pre-installed spliced fibers but want to move to a more flexible MTP backbone. Multimode and singlemode trays can also be mixed and matched giving even more flexibility and scalability.

Installation in under 10 seconds

The LISA fiber tray can be installed in under 10 seconds without any tools. The integrated sliding feature and self-locking system makes the installation simple, fast and repeatable. This core feature contributes to faster deployment times.

Excellent fiber routing with bend-radius protection

The LISA fiber tray is designed to manage fibers safely and neatly without compromising user handling or optical performance. The internal guiding elements of the tray maintain the minimum bend-radius of fibers and also provide clear separation between incoming fibers and pre-loaded pigtails. Out-going patch cords are safely guided away from the tray with an integrated guiding arm. This guiding arm maintains a horizontal guidance of the cables and provides a consistent service loop for regular moves, adds and changes.











LISA MTP Transition Solution

The LISA MTP fiber tray incorporates transition assemblies from MTP connectors on one side and standard connectors such as LC on the other side. The MTP connector offers a high degree of flexibility and speed because it only takes a few seconds to slide the fiber tray into the LISA CDR, NGR, and ODU system and connect the MTPs to pre-installed backbone cables.

The other benefit of LISA MTP fiber trays is the fact that you can easily change the fiber tray at any time without disrupting the pre-installed backbone cabling infrastructure. This means that you can easily change connectivity types without a great deal of complexity and cost.

The flexibility of LISA MTP fiber trays has an important bearing on the future of our structured cabling industry. With the migration from 10G to 40G and 100G, it is necessary that you have a suitable migration path from lower data rates to higher data rates. In simple terms, this means that although LC connectors are the popular choice now for 10G, the future will see a change to MTP connectors as recommended by various standardization bodies.

In summary, if you choose to implement LISA MTP/LC fiber trays today, you will have a platform capable of achieving your immediate 1G or 10G needs and additionally, the ability to easily migrate to 40G or 100G links in the future.



Characteristics

- Pre-terminated MTP transition module for instant plug and play connectivity
- MTP elite connectivity
- Super low-loss multimode OM4
- Module access completely from the front side
- Side-facing adapter alignment for higher laser safety
- Patch cords horizontally supported
- For up to 36 LC duplex or 18 SC simplex connections per tray
- Upgrade path from 10G to 40G and 100G
- Easy traceability by color and label
- Fast installation without tools
- Clear label platforms for fast traceability

Technical data

Attribute		Value
Dimension ($W \times H \times D$)		11.3 × 0.7 × 10.3 in (with hinge and patch cord arm)
Rack unit		0.5 U
Capacitiy (maximum)	overall per module	up to 18 channels (36 fibers)
	overall per rack unit	2 modules, up to 36 channels (72 fibers) Note: for certain adapter types the maximum fiber count is limited
RoHS requirements		fully compliant
Ingress protection degree (EN60529)		IP20
Resistance to impact (EN62262)		IK03
Bend radius limitation		1.2 in
Temperature resistanc	e (long term)	-40 to +70 °C (-40 to +158 °F)

Optical performance

Performance classes patch field	Attenuation "reference measuring"				
	IEC 61300-3-4, method B		IEC 61300-3-6	IEC 61300-3-6	
	IL max	IL mean	RL UPC	RLAPC	
Singlemode standard class	0.30 dB	0.20 dB	> 50 dB	> 85 dB 1)	
Multimode standard class	0.25 dB ²⁾	n/a	> 35 dB	n/a	
Multimode low-loss class	0.15 dB ²⁾	n/a	> 35 dB	n/a	
Performance classes MT					
Singlemode standard class	0.75 dB	0.30 dB	> 50 dB	> 85 dB 1)	
Singlemode elite class	0.35 dB	0.15 dB	> 50 dB	> 85 dB 1)	
Multimode standard class	0.60 dB ²⁾	n/a	> 35 dB	n/a	
Multimode elite class	0.35 dB ²⁾	n/a	> 35 dB	n/a	

¹⁾ Measurement method 3 (OLCR) ²⁾ Measured with Encircled Flux (EF)

Multimode OM3



Description	ltem no.
LC ports	
1-way MTP tray, 24 fiber MTP24 female – OM3 elite class, 12 LC duplex ports – standard class, aqua, TIA code, polarity R1	85072992
2-way MTP tray, 24 fiber MTP12 male – OM3 elite class, 12 LC duplex ports – standard class, aqua, TIA code, polarity AS	84132645
2-way MTP tray, 24 fiber MTP12 male – OM3 elite class, 12 LC duplex ports – standard class, heather violet, TIA code, polarity AS	85027487
2-way MTP tray, 24 fiber MTP12 male - OM3 elite class, 12 LC duplex ports - standard class, red, TIA code, polarity AS	85027485
2-way MTP tray, 24 fiber MTP12 male - OM3 elite class, 12 LC duplex ports - standard class, yellow, TIA code, polarity AS	84145478
3-way MTP tray, 24 fiber MTP8 female – OM3 elite class, 12 LC duplex ports – standard class, aqua, TIA code, polarity NS	85072991
3-way MTP tray, 36 fiber MTP12 male - OM3 elite class, 18 LC duplex ports - standard class, aqua, TIA code, polarity AS	85011331
3-way MTP tray, 36 fiber MTP12 male - OM3 elite class, 18 LC duplex ports - standard class, blue, TIA code, polarity AS	85065000
3-way MTP tray, 36 fiber MTP12 male - OM3 elite class, 18 LC duplex ports - standard class, green, TIA code, polarity AS	85027482
3-way MTP tray, 36 fiber MTP12 male - OM3 elite class, 18 LC duplex ports - standard class, orange, TIA code, polarity AS	85064989
3-way MTP tray, 36 fiber MTP12 male - OM3 elite class, 18 LC duplex ports - standard class, red, TIA code, polarity AS	85027484
SC ports	
1-way MTP tray, 12 fiber MTP12 male – elite class, 12 SC simplex ports – standard class, aqua , TIA code, polarity AS	84114518

Multimode OM4



Description	ltem no.
LC ports	
1-way MTP tray, 12 fiber MTP12 male – OM4 elite class, 6 LC duplex ports – low-loss class, aqua, TIA code, polarity AS	85024170
1-way MTP tray, 12 fiber MTP12 male – OM4 elite class, 6 LC duplex ports – low-loss class, heather violet, TIA code, polarity AS	85069461
1-way MTP tray, 24 fiber MTP24 female – OM4 elite class, 12 LC duplex ports – low-loss class, heather violet, TIA code, polarity R1	85072994
2-way MTP tray, 24 fiber MTP12 male - OM4 elite class, 12 LC duplex ports - low-loss class, aqua, TIA code, polarity AS	84116094
2-way MTP tray, 24 fiber MTP12 male – OM4 elite class, 12 LC duplex ports – low-loss class, green, TIA code, polarity AS	84127814
2-way MTP tray, 24 fiber MTP12 male – OM4 elite class, 12 LC duplex ports – low-loss class, heather violet, TIA code, polarity AS	84132648
2-way MTP tray, 24 fiber MTP12 male – OM4 elite class, 12 LC duplex ports – low-loss class, orange, TIA code, polarity AS	84127800
3-way MTP tray, 24 fiber MTP8 female – OM4 elite class, 12 LC duplex ports – low-loss class, heather violet, TIA code, polarity NS	85072993
3-way MTP tray, 36 fiber MTP12 male – OM4 elite class, 18 LC duplex ports – low-loss class, aqua, TIA code, polarity AS	85017723
3-way MTP tray, 36 fiber MTP12 male – OM4 elite class, 18 LC duplex ports – low-loss class, heather violet, TIA code, polarity AS	85017721
3-way MTP tray, 36 fiber MTP12 male – OM4 elite class, 18 LC duplex ports – low-loss class, orange, TIA code, polarity AS	85017724
SC ports	
1-way MTP tray, 12 fiber MTP12 male – OM4 elite class, 12 SC simplex ports – low-loss class, heather violet, TIA code, polarity AS	84132649
1-way MTP tray, 12 fiber MTP12 male – OM4 elite class, 12 SC simplex ports – low-loss class, gray , TIA code, polarity AS	85032250

Singlemode



Description	Item no.
LC-UPC ports	
1-way MTP tray, 12 fiber MTP12 male – OS2 standard class, 6 LC duplex ports – SM standard class, yellow, TIA code, polarity AS	85067545
1-way MTP tray, 24 fiber MTP24 male – OS2 elite class, 12 LC duplex ports – SM standard class, yellow, TIA code, polarity AS	85019035
2-way MTP tray, 24 fiber MTP12 male - OS2 elite class, 12 LC duplex ports - SM standard class, blue, TIA code, polarity AS	84145386
2-way MTP tray, 24 fiber MTP12 male – OS2 elite class, 12 LC duplex ports – SM standard class, gray , TIA code, polarity AS	84145407
2-way MTP tray, 24 fiber MTP12 male – OS2 elite class, 12 LC duplex ports – SM standard class, heather violet, TIA code, polarity AS	85027490
2-way MTP tray, 24 fiber MTP12 male – OS2 elite class, 12 LC duplex ports – SM standard class, orange, TIA code, polarity AS	85028772
2-way MTP tray, 24 fiber MTP12 male – OS2 elite class, 12 LC duplex ports – SM standard class, red, TIA code, polarity AS	85027489
2-way MTP tray, 24 fiber MTP12 male – OS2 elite class, 12 LC duplex ports – SM standard class, yellow, TIA code, polarity AS	84116087
2-way MTP tray, 24 fiber MTP12 male – OS2 standard class, 12 LC duplex ports – SM standard class, blue, TIA code, polarity AS	84099155
2-way MTP tray, 24 fiber MTP12 male – OS2 standard class, 12 LC duplex ports – SM standard class, green, TIA code, polarity AS	84099361
2-way MTP tray, 24 fiber MTP12 male - OS2 standard class, 12 LC duplex ports - SM standard class, red, TIA code, polarity AS	84099360
2-way MTP tray, 24 fiber MTP12 male – OS2 standard class, 12 LC duplex ports – SM standard class, yellow, TIA code, polarity AS	84088536
3-way MTP tray, 36 fiber MTP12 male – OS2 elite class, 18 LC duplex ports – SM standard class, blue, TIA code, polarity AS	85026880
3-way MTP tray, 36 fiber MTP12 male – OS2 elite class, 18 LC duplex ports – SM standard class, green, TIA code, polarity AS	85028452
3-way MTP tray, 36 fiber MTP12 male – OS2 elite class, 18 LC duplex ports – SM standard class, heather violet, TIA code, polarity AS	85026828
3-way MTP tray, 36 fiber MTP12 male – OS2 elite class, 18 LC duplex ports – SM standard class, orange, TIA code, polarity AS	85021550
3-way MTP tray, 36 fiber MTP12 male - OS2 elite class, 18 LC duplex ports - SM standard class, red, TIA code, polarity AS	85027491
3-way MTP tray, 36 fiber MTP12 male - OS2 elite class, 18 LC duplex ports - SM standard class, yellow, TIA code, polarity AS	85019037
3-way MTP tray, 36 fiber MTP12 male – OS2 standard class, 18 LC duplex ports – SM standard class, yellow, TIA code, polarity AS	85019870

SC-UPC ports	
1-way MTP tray, 12 fiber MTP12 male – OS2 elite class, 12 SC simplex ports – SM standard class, blue, TIA code, polarity AS	84149634
1-way MTP tray, 12 fiber MTP12 male – OS2 standard class, 12 SC simplex ports – SM standard class, blue, TIA code, polarity AS	84099845
1-way MTP tray, 12 fiber MTP12 male – OS2 elite class, 12 SC simplex ports – SM standard class, orange, TIA code, polarity AS	84112258
1-way MTP tray, 12 fiber MTP12 male - OS2 standard class, 12 SC simplex ports - SM standard class, red, TIA code, polarity AS	85032251
1-way MTP tray, 12 fiber MTP12 male – OS2 elite class, 12 SC simplex ports – SM standard class, yellow, TIA code, polarity AS	84110256



LC-APC ports	
1-way MTP tray, 24 fiber MTP24 female – OS2 elite class, 12 LC duplex ports – SM standard class, yellow, TIA code, polarity R1	85072967
2-way MTP tray, 24 fiber MTP12 male – OS2 elite class, 12 LC duplex ports – SM standard class, green, TIA code, polarity AS	84204698
2-way MTP tray, 24 fiber MTP12 male – OS2 elite class, 12 LC duplex ports – SM standard class, yellow, TIA code, polarity AS	84205262
2-way MTP tray, 24 fiber MTP12 male - OS2 standard class, 12 LC duplex ports - SM standard class, yellow, TIA code, polarity AS	85015521
3-way MTP tray, 24 fiber MTP8 female - OS2 elite class, 12 LC duplex ports - SM standard class, yellow, TIA code, polarity NS	85072990
SC-APC ports	
1-way MTP tray, 12 fiber MTP12 male – OS2 elite class, 12 SC simplex ports – SM standard class, yellow, TIA code, polarity AS	84148344



LISA Splicing Solution

The LISA side access system is focused on speed of installation and overall access. The LISA fiber tray can be installed safely and quickly. Access can be made at any time without the need for tooling and without disrupting pre-installed fibers. Reliability and performance are key to the success of your network. Therefore, we have ensured that the highest level of fiber protection and bend-radius limitation are standard across our side access system.

The centerpiece of the LISA side access system is a flexible fiber tray that can be used for almost any application or termination method. For example, the LISA fiber tray can be utilized for pigtail-splicing or pre-connectorized passive components such as splitters, CWDMs or FTTH combiners. The main function of the LISA fiber tray is a telescopic, 90° turned fiber termination module. The fibers of the main cable are either spliced onto pre-stripped fiber pigtails or spliced directly to an outgoing cable. The LISA fiber tray is supplied with up to 36 pre-connectorized fiber pigtails which have been pre-stripped and neatly stored ready for connection. Because the pigtails are pre-stripped, we are able to store longer pigtail lengths inside the tray and the process of fusion splicing is more consistent and repeatable. The LISA fiber tray has two distinct areas for storing fibers. One side is dedicated to the storage of pigtails and the other area is reserved for incoming cables. This separation of fibers simplifies and speeds up the splicing process as well as improves the identification and access to individual fibers.

LISA Splice Tray



Characteristics

- Quick installation and easy handling because of a double staged pull-out mechanism
- Module access completely from the front
- Hinge-down fiber tray offers immediate access to internal fibers
- Side-facing adapter alignment for higher laser safety
- Pull-out feature with service loop offers immediate access to adapters
- Patch cords horizontally supported for various connector types: up to 36 small form factor (SFF) or 18 big form factor (BFF) connectors
- Incoming fibers and pigtail fibers are stored in separate areas
- Pigtails pre-stripped to 250 µm for faster splicing
- Both fiber storage areas provide storage space of 1.5 m each
- Central splice bridge for heat shrink and sandwich splice protectors
- Retaining tabs on different height levels for faster insertion of fibers
- Bend radius limitation throughout
- Easy traceability by color and label

Technical data

Attribute		Value
Dimension ($W \times H \times D$)		11.3 × 0.7 × 10.3 in (with hinge and patch cord arm)
Rack unit		0.5 U
Capacitiy (maximum)	overall per module	up to 36 splices/fibers
	overall per rack unit	2 modules, up to 72 splices/fibers Note: for certain adapter types the maximum fiber count is limited
Conduit fastening (5 n	nm)	up to 4 conduits
RoHS requirements		fully compliant
Weight		module incl. packaging: 540 gr (without packaging: 350 gr)
Ingress protection degree (EN60529)		IP20
Resistance to impact (EN62262)		IK03
Bend radius limitation		1.2 in
Temperature resistance (long term)		-40 to +70 °C (-40 to +158 °F)

Optical performance

Pigtail performance class	Attenuation "each-to-each measuring"			
	IEC 61300-3-34		IEC 61300-3-6	
	IL 97 %	IL mean	RLUPC	RL APC
Singlemode standard class	0.45 dB	0.20 dB	> 50 dB	> 85 dB 1)
Singlemode standard class, BTW Pigtails	0.25 dB	0.12 dB	> 50 dB	> 85 dB ¹⁾
Singlemode grade B ²⁾	0.25 dB	0.12 dB	> 50 dB	> 85 dB ¹⁾
Multimode standard class	max. 0.25 dB ³⁾	n/a	> 35 dB	n/a

¹⁾ Measurement method 3 (OLCR)

²¹ All connectors are tuned acc. to IEC 61755-3-1/2, grade B ³¹ Measured at 850 nm, launch conditions acc. IEC 61300-1

LISA Splice to Patch Module

LC connectivity



Description	ltem no.
Singlemode G.652 D fiber, UPC polishing, standard performance	
Blue tray, 12 duplex adapters, 24 pigtails, no Color code, heat shrink comb with protectors 1.5 × 40 mm	84022862
Green tray, 12 duplex adapters, 24 pigtails, no Color code, heat shrink comb with protectors 1.5 × 40 mm	84015509
Orange tray, 12 duplex adapters, 24 pigtails, no Color code, heat shrink comb with protectors 1.5 × 40 mm	84247374
Yellow tray, 12 duplex adapters, 24 pigtails, no Color code, heat shrink comb with protectors 1.5 × 40 mm	85071865
Yellow tray, 12 duplex adapters, 24 pigtails, no Color code, sandwich comb without protectors	84007519
Yellow tray, 12 duplex adapters, 24 pigtails, TIA Color code, heat shrink comb with protectors 1.5 × 40 mm	85019039
Singlemode G.652 D fiber, APC polishing, standard performance	
Green tray, 12 duplex adapters, 24 pigtails, no Color code, heat shrink comb with protectors 1.5 × 40 mm	84026537
Blue tray, 12 duplex adapters, 24 pigtails, no Color code, heat shrink comb with protectors 1.5 × 40 mm	84045870
Multimode OM3 fiber, UPC polishing, standard performance	
Aqua tray, 12 duplex adapters, 24 pigtails, no Color code, sandwich comb with protectors	85002836
Aqua tray, 12 duplex adapters, 24 pigtails, TIA Color code, heat shrink comb with protectors 1.5 × 40 mm	85018939
Multimode OM4 fiber, UPC polishing, standard and low-loss performance	
Heather violet tray, 12 duplex adapters, 24 pigtails, no Color code, sandwich comb with protectors, standard performance	85002837
Heather violet tray, 12 duplex adapters, 24 pigtails, TIA Color code, heat shrink comb with protectors 1.5 × 40 mm, low-loss performance	85019038

LISA Splice to Patch Module

SC connectivity



Description	Item no.
Singlemode G.652 D fiber, UPC polishing, grade B performance	
Orange tray, 12 simplex adapters, 12 pigtails, no Color code, heat shrink comb with protectors 1.5 × 40 mm	84022860
Yellow tray, 12 simplex adapters, 12 pigtails, no Color code, sandwich comb without protectors	85002841
Singlemode G.657 D fiber, APC polishing, grade B performance	
Green tray, 12 simplex adapters, 12 pigtails, no Color code, heat shrink comb with protectors 1.5 × 40 mm	84132729
Multimode OM4 fiber, UPC polishing, low-loss performance	
Heather violet tray, 12 simplex adapters, 12 pigtails, no Color code, heat shrink comb with protectors 1.5 × 40 mm	85013398

LISA Splice to Splice Module

Ruggedized cable splicing

The ruggedized splicing solution with strain relief cable pigtails allows for direct fiber splicing. This reduces the amount of optical connections and line attenuation.

CTS assemblies

CTS assemblies have a factory made strain relief element on one side and a connector on the other side. Installers simply have to splice the fibers in the fiber tray followed by patching to the equipment.



- Direct splicing to incoming fibers
- Up to 36 fibers (18 duplex assemblies) per module
- Strain relief element factory mounted
- Slotted fixing method on the module
- One side terminated cable pigtail
- Cable types:
 - Simplex cable 1.7 or 2.0 mm
 - Duplex cable figure 8 (zip cord) 1.7 x 3.5 mm

Ordering information

Description	ltem no.
Blue fiber tray for assembling CTS assemblies, sandwich comb without protectors	84136247

Ruggedized pigtails

With the use of a fiber boot, standard patch cords can be directly spliced to network fibers. Slotted fiber tray front plates accommodate up to 16 fiber boots.



- Slotted fixing method for fast installation
- Compact design allows 16 glands per fiber tray
- No threaded nut required
- Two sizes of aramide cap
- Protective boot for cable sizes 1.4 to 2.6 mm and 2.7 to 3.2 mm
- Larger boot size is also suitable for 1.7 mm duplex cable

Description	ltem no.
Blue fiber tray for assembling 12 ruggedized pigtails 2.6 mm, heat shrink comb with 24 protectors 1.5 × 40 mm	84045875

LISA Splice to Splice Module

Splice through - direct cable to cable splicing

The LISA direct cable to cable splice tray is a single tray where the fibers are internally spliced. There are no external connectors.



- Fast splicing and reduced coiling time
- Lid with fiber identification
- Quick access to fibers (telescopic hinge)
- High density, up to 36 fibers on small footprint
- Bend radius control throughout
- Fiber overlength storage with integral heat shrink or sandwich splice comb

Ordering information

Description	ltem no.
Blue splice through fiber tray, up to 24 splices, sandwich comb without protectors	84045874
Aqua splice through fiber tray, up to 24 splices, heat shrink comb 1.5 × 40 mm without protectors	84086644
Gray splice through fiber tray, up to 24 splices, sandwich comb without protectors	84144605

IFC cable splicing

The LISA fiber tray for IFC cables (inter-facility cables) allows splicing of up to 2 x 24 fibers of different cable types. The IFC cable will enter the tray from the right hand side by using a specific bracket and thus will be routed within our LISA CDR/NGR in the same manner as patch cords.



- IFC cable fixed to the LISA fiber tray to provide an effective connection
- Standard glanding of incoming loose tubes
- Each 12/24 fiber bundle is routed in different areas
- Fast splicing and reduced coiling time
- Easy fiber identification and labeling

	_
Description	ltem no.
Blue fiber tray for splicing IFC cables, heat shrink comb with 12 protectors 1.5 × 40 mm	84071899
Yellow fiber tray for splicing IFC cables, heat shrink comb with 12 protectors 1.5 × 40 mm	84071905
Green fiber tray for splicing IFC cables, heat shrink comb with 24 protectors 1.5 × 40 mm	84127028



LISA Next Generation Fiber Trays

LISA fiber trays are the side-facing connectivity blocks that are inserted into the tray units within high density CDR racks. Designed for speed of installation and improved accessibility, LISA fiber trays can be installed and removed in under 10 seconds.

Fiber trays are available to cover a wide range of applications including pigtail splicing and MTP-LC transitions. Within the data center the majority of splicing applications are singlemode LC because this combination provides a future-proofed infrastructure which is low-loss and precise in terms of cable slack management.

MTP-LC transitions on the other hand are generally multimode OM3 or OM4, allowing the operator to reuse the MTP backbone and upgrade it later to parallel optics up to 40G and 100G.

In addition to the pigtail splicing and transition fiber trays, HUBER+SUHNER also offer a patching fiber tray which is designed to serve the increasing trend towards MTP parallel optic applications. The patching tray is also suitable for singlemode LC patching in applications where fast, factory tested links are required.

LISA Next Generation Fiber Trays

Single color approach

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- Gray colored tray with two labeling windows on front side
- Simple and individual adaptable color coding
- Easier inventory management

New fixation cover

- Increased operational security
- Available in all base types 8 / 12 / 24 fiber
- No changes on the performance or polarities
- Increased environmental effectness

Improved cable management

- Better slack cable management
- Improved bend radius tolerances

Compatible and interchangeable

LISA current generation and Next Generation are compatible and interchangeable with standard LISA components.









LISA Next Generation MTP Transition Modules



Characteristics

- Pre-terminated MTP transition module for instant plug and play connectivity
- 8, 12 (single row) or 24 fiber (double row) MTP transition module
- Module access from the front with side-facing adapters
- MTP Elite[®] connectivity
- Super low-loss multimode OM4
- Patch cords horizontally supported and managed
- Highly protected fibers
- Upgrade path from 10G to 40G and 100G
- Easy traceability by color and label
- Fast installation and easy handling without tools
- Service position for immediate access to adapters

Technical data

Attribute	Value
Dimension (W \times H \times D)	10.33 × 11.54 × 0.73 in
Rack unit	0.5 U
Capacitiy (maximum) overall per module	up to 18 ports (36 fibers)
overall per rack unit	2 modules, up to 36 ports (72 fibers) Note: for certain adapter types the maximum fiber count is limited
(without packaging: 350g / 12.35oz)	yes
Ingress protection degree (EN60529)	IP 20
Resistance to impact (EN62262)	IK 03
Bending radius	1.2 in
Temperature resistance (long term)	-40°C to +70°C (-40°F to +158°F)
UV resistance	resistant
RoHS requirements	fully compliant

Optical performance

Performance classes patch field	Attenuation "reference measuring" IEC 61300-3-4, method B			
			IEC 61300-3-6	
	IL max	IL mean	RLUPC	RLAPC
Singlemode standard class	0.30 dB	0.20 dB	> 50 dB	> 85 dB 1)
Multimode standard class	0.25 dB	n/a	> 35 dB	n/a
Multimode low-loss class	0.15 dB	n/a	> 35 dB	n/a
Performance classes MT				
Singlemode elite class	0.35 dB	0.10 dB	n/a	> 60 dB 1)
Multimode elite class	0.35 dB ²⁾	0.10 dB	> 30 dB	n/a

¹⁾ Measurement method 3 (OLCR)

^{2]} All connectors are tuned acc. to IEC 61755-3-1/2, grade B

LISA Next Generation MTP Transition Modules

Multimode OM3



Ordering information

Description	ltem no.
LC ports	
1-way MTP tray, 24 fiber MTP24 female – elite class, 12 LC duplex ports – standard class, TIA code, polarity R1	85088664
2-way MTP tray, 24 fiber MTP12 male – elite class, 12 LC duplex ports – standard class, TIA code, polarity AS	85088661
3-way MTP tray, 24 fiber MTP8 female – elite class, 12 LC duplex ports – standard class , TIA code, polarity NS	85088658

Multimode OM4



Ordering information

Description	ltem no.
LC ports	
1-way MTP tray, 24 fiber MTP24 female – elite class, 12 LC duplex ports – standard class, TIA code, polarity R1	85088671
2-way MTP tray, 24 fiber MTP12 male – elite class, 12 LC duplex ports – standard class, TIA code, polarity AS	85088662
3-way MTP tray, 24 fiber MTP8 female – elite class, 12 LC duplex ports – standard class , TIA code, polarity NS	85088659

Singlemode



Description	ltem no.
LC-UPC ports	
2-way MTP tray, 24 fiber MTP12 male – standard class, 12 LC duplex ports – standard class, TIA code, polarity AS	85086075
3-way MTP tray, 36 fiber MTP12 male - elite class, 18 LC duplex ports - standard class , TIA code, polarity AS	85092876
LC-APC ports	
1-way MTP tray, 24 fiber MTP24 female – elite class, 12 LC duplex ports – standard class, TIA code, polarity R1	85088663
2-way MTP tray, 24 fiber MTP12 male – elite class, 12 LC duplex ports – standard class, TIA code, polarity AS	85088660
3-way MTP tray, 24 fiber MTP8 female – elite class, 12 LC duplex ports – standard class , TIA code, polarity NS	85088657
3-way MTP tray, 36 fiber MTP12 male – elite class, 18 LC duplex ports – standard class , TIA code, polarity AS	85088080

LISA Next Generation Splice to Patch Fiber Trays



Characteristics

- Quick installation and easy handling without tools
- Module access from the front with side-facing adapters
- Pull-out and hinge-down function for service offers immediate access to internal fibers
- Side-facing adapter alignment for added laser safety
- Pull-out feature with service loop offers immediate access to adapters
- Patch cords horizontally supported and managed
- Incoming fibers and pigtail fibers are stored in separate areas
- Pigtails pre-stripped to 250 µm for faster splicing
- Both fiber storage areas provide storage space for 1.5 m of 250 µm fiber
- Central splice bridge fitted to secure heat shrink and sandwich splice protectors
- Retaining tabs on different height levels for faster insertion of fibers
- Designed with bend radius limiting geometry of 1.2 in minimum
- Easy to understand labeling and highly visible color coding

Technical data

Attribute		Value
Dimension ($W \times H \times D$)		10.33 × 11.54 × 0.73 in
Rack unit		0.5 U
Capacitiy (maximum)	overall per module	up to 36 splices/fibers
	overall per rack unit	2 modules, up to 72 splices/fibers Note: for certain adapter types the maximum fiber count is limited
Conduit fastening (5 r	nm)	up to 4 conduits
(without packaging: 3	50g / 12.35oz)	yes
Ingress protection deg	gree (EN60529)	IP 20
Resistance to impact (EN62262)		IK 03
Bending radius		1.2 in
Temperature resistance (long term)		-40°C to +70°C (-40°F to +158°F)
RoHS requirements		fully compliant

Optical performance

Туре	Measurement method (IL/RL)	IL (dB)	RL (dB)
SMUPC	IL: IEC 61300-3-4 method B	≤ 0.30	≥ 50
SM APC	RL: IEC 61300-3-6	≤ 0.30	≥65
MM OM3	IL: IEC 61300-3-34 method B	≤ 0.25	≥ 35
MM OM4	RL: IEC 61300-3-6	≤ 0.15	≥ 35

LISA Next Generation Splice to Patch Fiber Trays

LC connectivity



Ordering information

Description	Item no.
Singlemode G.652 D fiber, UPC/APC polishing, standard performance	
12 LC duplex adapters PC, 24 pigtails, no Color code, sandwich comb without protectors 1.5 × 40 mm	85088674
12 LC duplex adapters PC, 24 pigtails, no Color code, heat shrink comb with protectors $1.5 imes40$ mm	85088090
Singlemode G.652 D fiber, APC polishing, standard performance	
12 duplex adapters, 24 pigtails, no color code, heat shrink comb with protectors 1.5 $ imes$ 40 mm	85088093
Multimode OM3 fiber, UPC polishing, standard performance	
12 duplex adapters, 24 pigtails, TIA color code, heat shrink comb with protectors 1.5 $ imes$ 40 mm	85088675
Multimode OM4 fiber, UPC polishing, standard performance	
12 duplex adapters, 24 pigtails, TIA color code, heat shrink comb with protectors 1.5 × 40 mm	85088676

SC connectivity



Description	ltem no.
Singlemode G.652 D fiber, UPC polishing, grade B performance	
12 simplex adapters, 12 pigtails, no color code, heat shrink comb with protectors 1.5 × 40 mm	85088494

LISA Next Generation Fiber Tray – Splitter / PLC module



Characteristics

- Quick installation and easy handling without tools
- Module access from the front with side-facing adapters
- Pull-out and hinge-down function for service offers immediate access to internal fibers even during service
- Side-facing adapter alignment for added laser safety
- Pull-out feature with service loop offers immediate access to adaptors
- Patch cords horizontally supported & managed
- Incoming fibers and pigtail fibers are stored in separate areas
- Both fiber storage areas provide storage space for 1.5 m of 250 µm fiber
- Central splitter bridge
- Designed with bend radius limiting geometry of 30mm minimum
- Easy to understand labeling and highly visible port coding
- Service position for immediate access to adaptors

Technical data

Attribute	Value
Dimension (W \times H \times D)	10.33 × 11.54 × 0.73 in
Rack unit	0.5 U
Capacitiy (maximum) overall per module	1 pcs1 x 32 broadband PLC splitter2 pcs1 x 8 broadband PLC splitter12 pcs2 x 2 broadband PLC splitter4 pcs1 x 8 broadband PLC splitterNote: for certain adapter types the maximum fiber count is limited
Ingress protection degree (EN60529)	IP 20
Resistance to impact (EN62262)	IK 03
Bending radius	1.2 in
Temperature resistance (long term)	-40°C to +70°C (-40°F to +158°F)
RoHS requirements	fully compliant

LISA Next Generation Fiber Tray – Splitter / PLC module



Description	ltem no.
Splitter integration module: LC connectivity	
1 pcs 1 × 32 broadband PLC splitters, input and output on LC/APC, polished within standard performance class	85088499
2 pcs 1 × 8 broadband PLC splitters, input and output on LC/APC, polished within standard performance class	85088498
12 pc 2 x 2 broadband PLC splitter, input and output on LC/APC, polished within grade B performance class	85088099
4 pcs 1 × 8 broadband PLC splitter, input and output on LC/APC, polished within grade B performance class	85088500



LISA Patching Solution

LISA patching trays are generally used to build a cross-connect configuration either within the same LISA rack or between adjacent racks with the highest flexibility when using pre-terminated, factory tested cable systems.

Cable systems can be patched easily thanks to a sliding and pivoting design. Cables enter the trays from the left or right side, and are horizontally managed before entering the patching tray. This unique system differs from other patching trays because the tray is side facing and not forward facing. This means that cables connected to both sides of the LISA patching tray can be accessed simply by sliding the tray out. All cables that enter/exit the LISA patching tray have an integrated service loop so that removal and insertion of one cable can be made with minimal disruption to the remaining cables.

In today's networks, the LISA patching trays provide a simple upgrade path from LC-based 10G systems to MTP-based 40/100G systems. This is possible because each tray (and connection) can be upgraded individually.

LISA Patch to Patch Module



Characteristics

- MTP, LC or SC connectivity
- Up to 12 adapters per tray
- Fast installation without tools
- Module access completely from the front
- Side facing adapter alignment for higher laser safety
- Patch cords horizontally supported
- Full 1.2 in bend-radius limitation throughout
- Upgrade path from 10G to 40G and 100G
- Clear labeling for quick identification and traceability

Technical data

Attribute	Value
Dimension (W \times H \times D)	9.5 x 0.7 x 10.1 in
Rack unit	0.5 U
Capacitiy (maximum) overall per module	up to 12 channels
overall per rack unit	2 modules, up to 24 channels
RoHS requirements	fully compliant
Ingress protection degree (EN60529)	IP20
Resistance to impact (EN62262)	IK03
Bend radius limitation	1.2 in
Temperature resistance (long term)	-40 to +70 °C (-40 to +158 °F)

LISA Patch to Patch Module

MTP connectivity



Ordering information

Description	ltem no.
Patching tray, 12 MTP adapter, key-up/key-down	85015429

LC connectivity



Ordering information

Description	Item no.
Patching tray, 12 LC APC duplex adapters green	85024771
Patching tray, 6 LC UPC duplex adapters blue	85065139
Patching tray, 12 LC UPC duplex adapters blue	85074415

SC connectivity



Description	ltem no.
Patching tray, 12 SC APC simplex adapters	85024769





IANOS

The IANOS family of high density fiber management from HUBER+SUHNER is a state of the art fiber optic management system which facilitates fast, flexible and future-proofed connectivity in the structured cabling market. As its name suggests, "IANOS" (as in Roman mythology) looks to the past as well as to the future. This means that IANOS is a combination of previous experience and valuable insight into the future.

Networks are constantly adapting to reflect the demands placed on them, and today's fiber management systems need to accommodate these changes with the minimum amount of cost, time and disruption. As networks evolve, we see a broad mixture of applications and data rates depending on the location, the business model and of course the data demand. IANOS accommodates these changes by offering the widest range of connectivity scenarios in a single generic platform.


IANOS 4U chassis

The IANOS 4U chassis is designed for high density applications where connections to high density blade servers and switches are required in the same or adjacent racks. Generally mounted above or below switches, the IANOS 4U chassis supports up to 576 fibers (288 ports) in LC duplex. The split design of the IANOS chassis allows users to separate redundant cable feeds down different sides of the equipment cabinet so that there is less risk of disruption to live traffic.

IANOS 1U chassis

The IANOS 1U chassis is designed for medium to high density applications where connections to servers and switches are required in the same or adjacent racks. Generally mounted at the top of equipment cabinets, the IANOS 1U chassis supports up to 144 fibers (72 ports) in LC duplex or the IANOS lite chassis supports up to 96 fibers (48 ports). The split design of the IANOS chassis allows users to separate redundant cable feeds down different sides of the equipment cabinet so that there is less risk of disruption to live traffic.

IANOS 19" Chassis 1U and 4U



Characteristics

- Up to 12 modules/72 ports (LC duplex/MTP) per 1U space
- Insertion and removal of drawers and modules with one hand
- Horizontal opening front-door, separate redundant paths
- Labeling within front-door or as a slide-out system from within the chassis central dividing element
- Single-handed handling of drawers and modules
- Same modules for all IANOS applications
- Optional rear cable manager with divider plate (left/right)

IANOS chassis are high density scalable sub-racks designed to accommodate the next generation of data rates and transceivers in rapidly evolving network services. Available in 1U or 4U increments, the IANOS chassis delivers industry leading density and best in class handling across almost every application be it splicing, pre-terminated cables or direct patching.

IANOS modules can be inserted from the front or the rear of the chassis and it is possible to mix and match any of the IANOS single or double modules in the same individual chassis. Unlike other fiber panels on the market, the IANOS chassis has a split design separating the left hand side of the chassis from the right hand side. This means that users are able to access just one half of the connectivity row without disrupting pre-installed business-critical fibers. The unique central door system of the IANOS chassis further acts as a clear separation element between the two sides of the panel, and users are deliberately prevented from crossing fibers from one side of the chassis to the other. This split-panel principle also helps to maintain redundant cable paths and reduces the risk of possible downtime.

Attribute	Value
Rack unit	1U and 4U
Mounting type	standard 19 in rails
Dimensions (W \times D \times H)	1U: 19 × 12.9 × 1.7 in 4U: 19 × 12.9 × 6.97 in
Weight	1U: 8.0 lb 4U: 27.3 lb
Material	chassis and drawers: stainless steel powder coated other components: UPC/ABS
Color	gray housing (RAL 7047) with blue control elements
Capacity	1U: up to 12 × IANOS modules 4U: up to 48 × IANOS modules
Density	1U: up to 72 ports (LC duplex/MTP) 4U: up to 288 ports (LC duplex/MTP)

Technical data

Environmental data for all chassis and modules

Attribute	Value
Free of halogen	yes
2011/65/EC (RoHS)	fully compliant

Key Features IANOS Chassis

Clearer and faster identification

The IANOS chassis is fully loaded with numerous identification areas for clearer and faster traceability. Doors can be labelled for identification or to show redundant feeds. Patching rows, module positions and of course port positions are all clearly marked on the product itself. There is even a slide out label in the center of the chassis for additional information.



Quick and easy access to patch cords

Because the IANOS chassis is constructed with three sliding trays on the left and right side of the chassis, access to connectors is fast and easy. Each tray can be slid out independently so that there is minimum disruption to pre-installed cords.

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Split design for improved cable separation

Standardisation bodies such as TIA and IEC recommend that redundant cable paths are created in the data center. The IANOS system facilitates this by completely separating cables entering or exiting the chassis. The benefit of this is zero disruption to redundant paths and much clearer identification of live/redundant traffic.

IANOS chassis 1U, 4U and zero-space



Ordering information

Description	ltem no.
IANOS 1U chassis, gray, for up to 12 × IANOS modules *	85069469
IANOS 4U chassis, gray, for up to 48 × IANOS modules *	85069470
IANOS 1U rear cable manager, gray	85069473
IANOS 4U rear cable manager, gray	
IANOS zero space chassis, gray, for up to 6 IANOS modules	

* Chassis supplied with standard white label and front doors. Rear cable manager needs to be ordered separately.

IANOS Lite 19" Chassis 1U



Characteristics

- High density sub-rack for up to 8 modules 48 x ports (LC-duplex/MTP) per 1U space
- Quick and simple installation of sub-rack, modules and cables
- Insertion of single and double modules from the rear and front
- Easy access and protection of ports through horizontal opening front door (Optional)
 Fixed tray design
- Labeling within front-door or as a slide-out system
- Compatible to all double or single IANOS modules

Skeleton version

IANOS Lite chassis are high density scalable sub-racks designed to accommodate the next generation of data rates and transceivers in the rapidly evolving structured cabling market. Available in 1U increments, the IANOS lite chassis delivers industry leading density and best-in-class handling across almost every application be it splicing, pre-terminated cables or direct patching.

IANOS modules can be inserted from the front or the rear of the chassis and can be mixed and matched with any of the IANOS single or double modules in the same individual chassis. Unlike other fiber panels on the market, the IANOS lite chassis has a non-moving tray design. This means that end-users are able to access connectivity rows without disrupting pre-installed business-critical fibers by sliding modules out of the chassis. The unique central door system of the IANOS chassis further acts as a clear separation element between the two sides of the panel assuring that users are deliberately prevented from crossing fibers from one side of the chassis to the other. This split-panel principle also helps to maintain redundant cable paths and reduces the risk of possible downtime.

Technical data

Attribute		Value
Rack unit		10
Mounting type		standard 19 in rails
Dimensions ($W \times D \times H$)	Skeleton version: Standard version:	19 × 11.9 × 1.7 in 19 × 8.6 × 1.7 in
Weight	Skeleton version: Standard version:	1.6 lb 2.3 lb
Material		Chassis and drawers: stainless steel powder coated Other components: UPC/ABS
Color		gray housing (RAL 7047) with blue control elements
Capacity		1U: up to 8 × IANOS modules
Density		1U: up to 48 ports (LC duplex/MTP)

Environmental data for all chassis and modules

Attribute	Value
Free of halogen	yes
2011/65/EC (RoHS)	fully compliant

Key Features IANOS Lite 19" Chassis

Quick and easy access to patch cords

The IANOS lite chassis is designed to provide easy handling as wall as fast and complete access to the connectors. The unique design also allows installers easy access from the back and the front of the IANOS lite chassis when installing fibers. Cable guides allow for safe handling and routing of the patch cords on both sides.



No disruping of live patch cords

The fixed tray design provides highly secure connections with no disruption to pre-installed patch cords and modules. The simple design of the chassis and extra space between the modules allows the addition or removal of patch cords even when other connections are live. This in turn reduces the risk of downtime and damage to the patch cords.



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Fast MAC's

Because the modules do not need to be moved during patching, a fast and straight forward approach is possible. The integrated cable management system enables easy, quick and scalable cabling throughout the lifecycle of your network.



IANOS Lite Chassis 1U, Standard and Skeleton

Chassis



Ordering information

Description	ltem no.
IANOS lite standard 1U chassis, gray for up to 8 x IANOS modules	
IANOS lite skeleton 1U chassis, gray for up to 8 x IANOS modules	85089215

Chassis accessories

Description	ltem no.
IANOS-LITE-SIDE-CABLE-MGT-T4	85089277
IANOS-LITE-CENT-CABLE-MGT-T4	85089214
IANOS 1U rear cable manager, gray	85069473
IANOS blanking plate	85086306
IANOS mandrel set	85085974

HUBER+SUHNER Fiber Base Types

A wide variance of different backbone types allows you to satisfy your immediate requirements but also offers you the scalability and upgradability required for the future. HUBER+SUHNER offers a wide range of backbone solutions (Base-2, Base-8, Base-12 and Base-24). This broad range of solutions allows for an easy upgrade from today's 10G links to future 40G or 100G links.

Ð Base-2 The Base-2 system is based on LC trunks in the backbone. The Base-2 system is generally used in single mode applications where the ability to upgrade to higher data rates is guaranteed by the optical performance of the fiber. Ð Base-8 The Base-8 system is based on pinned MTP trunks in the backbone. The Base-8 system is SR4 ready which means that the backbone connectivity has the same fiber count as the SR4 transceiver. This matched connectivity means that customers can patch directly to SR4 transceivers without having to convert connectors with different fiber counts or waste excess fibers in the backbone. Ð Base-12 The Base-12 system is based on un-pinned trunks in the backbone. The Base-12 system is partially SR4 ready because unlike the Base-8 system, Base-12 does not utilize all of the fibers in the backbone when patched directly with SR4 transceivers. Multiple Base-12 connectors can be combined and then converted so that full fiber utilization can still be achieved. A Base-24 Base-24 is generally deployed for 100G parallel links running over SR10 transceivers. Normally these links are between two high data-rate switches as opposed to switch to server.

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IANOS Modules

IANOS modules are interchangeable connectivity blocks that can be inserted into the IANOS chassis from the front and rear side. A wide range of different modules are available to cover many different applications such as patching, splicing, transition and conversion. Single and double modules are available to give users a higher degree of flexibility and choice as to how they want to build their fiber optic infrastructure.

IANOS modules are extremely compact as well as lightweight and can easily be inserted and removed as the infrastructure evolves. Operators who upgrade their infrastructure to higher data rates can remove their legacy 10G modules, then replace them with modules more suitable for 40G and 100G for example. This building block approach is what makes the IANOS system so scalable and adaptive.

All of the IANOS modules contain high-performance optical fibers and components so that the total hardware loss is reduced to an absolute minimum. This is important in higher data rate environments because allowable optical budgets are significantly lower at 40G and 100G than they are for legacy 1G and 10G systems. This enhanced performance helps operators to maintain flexibility whilst achieving performance.

Key Features IANOS Modules

Color-coded MTP adapters

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A unique feature of the IANOS patching module is color coded adapters by Base-type. Colored frames are added to the outer face of the adapter so that users can quickly identify MTP types. This color scheme is also continued through the cable system portfolio so that users can visually check that the correct trunks or cords are connected together.

Polarity flippable adapters

The MTP adapter fitted to all IANOS modules can be removed and rotated so that the polarity can be adjusted in the field. This allows users to convert a type A adapter (key-up to key-down) to a type B adapter (key-up to key-up). A clear marking is provided on the top of the adapter to show the type being deployed.

Supported by high performance HUBER+SUHNER harnesses

The IANOS patching modules can either be fed from the rear with a trunk cable or alternatively harnesses can be connected to the front of the module. The HUBER+SUHNER cable harnesses are extremely compact both in terms of cable diameter and furcation body. These two products compliment each other superbly and offer the customer a total solution that is compact as well as optimized for performance and handling.







IANOS Patching Modules



Characteristics

- 6 x adapters per module (LC duplex/MTP/SC simplex)
- Fast and tool-less installation
- Cable guide at rear
- Facilitates patching to transceiver
- Available in Singlemode and Multimode OM3/OM4 performance
- Compatible with IANOS 1U/4U and zero space chassis
- Color coded LC adapters by performance
- Color coded MTP adapter shrouds by Base-type

The IANOS patching module is a straight through MTP or LC patching field which allows trunk cables to be connected directly to patch cords or harnesses. In Base-2 singlemode applications, the IANOS patching module provides a fast plug and play alternative to fusion splicing. For MTP multimode applications, the patching module is designed to facilitate end-to-end parallel optics using Base-8, Base-12 or Base-24 connectivity.

Technical data

Attribute		Value	
Product family		IANOS	
Suitable for		Chassis Zero space chassis	
Dimensions ($W \times D \times H$)		3.81 × 6.77 × 0.47 in	
Material		PC/ABS	
Color		black (RAL 9005)	
Number of adapters	front	6 × LC duplex adapter/6 × MTP adapters/ 6x SC simplex	
	rear	n/a	
Adapter types	front	LC duplex/MTP key-up/key-down (reversible to key-up/key-up if needed)	
	rear	n/a	
Adapter Colors	LC	blue (SM/UPC) aqua (MM/OM3/OM4)	
	MTP MM	black body/gray shroud (8 fiber) black body/black shroud (12 fiber) black body/red shroud (24 fiber)	
	MTP SM	green body/gray shroud (8 fiber) green body/black shroud (12 fiber) green body/red shroud (24 fiber)	
	SC	black (SM/MM)	

Key Features Patching Modules

Simpler upgrades with MTP patch and LC harness

As networks migrate to higher data rates, the LC connector is being replaced by the MTP connector. MTP is generally used to aggregate 10G server connections to 40G and 100G switch ports. Because the majority of LC-MTP upgrades are at the switch end, it makes sense to deploy a MTP patch module in the switch rack and then run harnesses to the server.

Quick feed-through functionality to pre-installed modules

The IANOS patching module incorporates a cable guiding system at the rear of the module which facilitates fast and simple installation of trunk cables. Trunk cables are terminated on the back of the adapter while patch cords are terminated on the front of the adapter.

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IANOS Patching Modules



Ordering information

Description	ltem no.
Patching module, single size, Base-2, 6 × LCD adapter blue, Singlemode UPC	85072924
Patching module, single size, Base-2, 6 x LCD adapter green, Singlemode APC	
Patching module, single size, Base-2, 6 × LCD adapter aqua, Multimode UPC (OM3/OM4)	85073354



Ordering information

Description	ltem no.
Patching module, single size, Base-1, 6x SC simplex adapter black, Singlemode and Multimode (OM3/OM4)	85083805



Description	ltem no.
Patching module, single size, Base-8, 6 × MTP8 adapter body black, shroud gray, key-up/key-down	85072925
Patching module, single size, Base-8, 6 x MTP8 adapter body black, shroud gray, key-up/key-up	
Patching module, single size, Base-8, 6 x MTP8 adapter body green, shroud gray, key-up/key-down	85072928

IANOS Patching Modules



Ordering information

Description	ltem no.
Patching module, single size, Base-12, 6 × MTP12 adapter body black, shroud black, key-up/key-down	85072929
Patching module, single size, Base-12, 6 × MTP12 adapter body black, shroud black, key-up/key-up	
Patching module, single size, Base-12, 6 × MTP12 adapter body green, shroud black, key-up/key-down	85072927



Description	ltem no.
Patching module, single size, Base-24, 6 × MTP24 adapter body black, shroud red, key-up/key-down	85072931
Patching module, single size Base-24, 6 x MTP24 adapter body black, shroud red, key-up/key-up	85072932

IANOS MTP-LC Transition Modules



Characteristics

- \bullet MTP to LC transition
- Single and double modules available
- Fast and tool-less installation
- Facilitates patching to transceiver
- Available for Base-8, 12 and 24
- Available in Multimode OM3/OM4 and Singlemode performance
- Compatible with IANOS 1U/4U and zero space chassis
- Color coded LC adapters by performance
- Color coded MTP adapter shrouds by Base-type

IANOS transition modules convert MTP backbone cables to LC connectivity at the front of the module so that LC patch cords can be connected to nearby active equipment. Generally used for lower data rates such as 1G, 10G or 16G. IANOS transition modules offer users the possibility to upgrade their LC based links in the future simply by replacing the transition module with an MTP based conversion module, patching module or conversion harness. Transition modules are available in single or double versions and are suitable for Base-8, Base-12 or Base-24 MTP backbones.

Technical data

Attribute		Value
Product family		IANOS
Suitable for		chassis/zero space chassis
Dimensions ($W \times D \times H$)		single module 3.8 × 6.8 × 0.5 in double module 7.7 × 6.8 × 0.5 in
Material		UPC/ABS
Color		black (RAL 9005)
Adapter types	front	LC duplex
	rear	MTP 8, 12 or 24 (key-up/key-down)
Adapter Colors	LC	aqua (MM/OM3), heather violet (MM/OM4), blue (SM/OS2)
	MTP MM	black body/gray shroud (8 fiber) black body/black shroud (12 fiber) black body/red shroud (24 fiber)
	MTP SM	green body/gray shroud (8 fiber) green body/black shroud (12 fiber) green body/red shroud (24 fiber)
Ferrule	LC	zirconia ceramic
	MTP	composite

Optical data

Attribute	Value
Fiber count	single module 8 or 12, double module 24
Fiber type	Multimode 50/125 µm OM3 Multimode 50/125 µm OM4 Singlemode 9/125 µm OS2
Module insertion loss	MM OM3: ≤0.45 dB MM OM4: ≤0.35 dB SM OS2: ≤0.50 dB
Module return loss	MM OM3: ≥30 dB MM OM4: ≥30 dB SM OS2 UPC: ≥50 dB SM OS2 APC: ≥60 dB

Key Features Transition Modules

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MTP 10G systems that are upgradeable in the future

Transition modules using MTP connectivity at the rear of the module allows users to build an upgradeable backbone suitable for 40G or 100G in the future. Deploying MTP in the backbone also offers users a high degree of flexibility when connecting different types of interfaces and equipment.



Single and double modules for increased flexibility

Having the flexibility of a single or double module in the IANOS portfolio is crucial for many applications. The double module offers improved routing space and handling when splicing cables. It also allows high fiber-count trunk cables to be better utilized in the chassis. A Base-8 double module supports a trunk cable that has 24 fibers and splits to 3 x 8 fiber MTPs at the rear of the module. This reduces the size and installation time of the cable and also provides 100 % port density in the chassis.



Low-loss performance 0.35 dB

As data rates increase in a network, the distance over which you can transmit data is reduced significantly. Furthermore, the total optical loss budget is also lowered at higher data rates. To compensate this effect, you need to deploy super low-loss components in all areas of the link so that flexibility can be maintained without compromising performance.

IANOS MTP-LC Transition Modules



Ordering information

Description	Item no.
Transition module, single size, Base-8, front 4 × LCD adapter aqua, rear 1 × MTP8, non-pinned, adapter body black, shroud gray, key-up/key-down, MM OM3, polarity NS	85072938
Transition module, double size, Base-8, front 12 × LCD adapter aqua, rear 3 × MTP8, non-pinned, adapter body black, shroud gray, key-up/key-down, MM OM3, polarity NS	85072954
Transition module, single size, Base-8, front 4 × LCD adapter heather violet, rear 1 × MTP8, non-pinned, adapter body black, shroud gray, key-up/key-down, MM OM4, polarity NS	85072939
Transition module, double size, Base-8, front 12 × LCD adapter heather violet, rear 3 × MTP8, non-pinned, adapter body black, shroud gray, key-up/key-down, MM OM4, polarity NS	85072955
Transition module, single size, Base-8, front 4 × LCD adapter blue, rear 1 × MTP8, non-pinned, adapter body green, shroud gray, key-up/key-down, SM OS2 UPC, polarity NS	85072940
Transition module, double size, Base-8, front 12 × LCD adapter blue, rear 3 × MTP8, non-pinned, adapter body green, shroud gray, key-up/key-down, SM OS2 UPC, polarity NS	85072956



Description	ltem no.
Transition module, single size, Base-12, front 6 × LCD adapter aqua, rear 1 × MTP12, pinned, adapter body black, shroud black, key-up/key-down, MM OM3, polarity AS	85072942
Transition module, single size, Base-12, front 6 × LCD adapter aqua, rear 1 × MTP12, pinned, adapter body black, shroud black, key-up/key-down, MM OM3, polarity AP	85072943
Transition module, double size, Base-12, front 12 × LCD adapter aqua, rear 2 × MTP12, pinned, adapter body black, shroud black, key-up/key-down, MM OM3, polarity AS	85072957
Transition module, double size, Base-12, front 12 × LCD adapter aqua, rear 2 × MTP12, pinned, adapter body black, shroud black, key-up/key-down, MM OM3, polarity AP	85072958
Transition module, single size, Base-12, front 6 × LCD adapter heather violet, rear 1 × MTP12, pinned, adapter body black, shroud black, key-up/key-down, MM OM4, polarity AS	85072944
Transition module, single size, Base-12, front 6 × LCD adapter heather violet, rear 1 × MTP12, pinned, adapter body black, shroud black, key-up/key-down, MM OM4, polarity AP	85072945
Transition module, double size, Base-12, front 12 × LCD adapter heather violet, rear 2 × MTP12, pinned, adapter body black, shroud black, key-up/key-down, MM OM4, polarity AS	85072959
Transition module, double size, Base-12, front 12 × LCD adapter heather violet, rear 2 × MTP12, pinned, adapter body black, shroud black, key-up/key-down, MM OM4, polarity AP	85072960

IANOS MTP-LC Transition Modules



Ordering information

Description	ltem no.
Transition module, single size, Base-12, front 6 × LCD adapter blue, rear 1 × MTP12, pinned, adapter body green, shroud black, key-up/key-down, SM OS2 UPC, polarity AS	85072946
Transition module, single size, Base-12, front 6 × LCD adapter blue, rear 1 × MTP12, pinned, adapter body green, shroud black, key-up/key-down, SM OS2 UPC, polarity AP	85073356
Transition module, single size, Base-12, front 6 × LCD adapter green, rear 1 × MTP12, pinned, adapter body green, shroud black, key-up/key-down, SM OS2 APC, polarity AS	85073357
Transition module, double size, Base-12, front 12 × LCD adapter blue, rear 2 × MTP12, pinned, adapter body green, shroud black, key-up/key-down, SM OS2 UPC, polarity AP	85073364
Transition module, double size, Base-12, front 12 × LCD adapter blue, rear 2 × MTP12, pinned, adapter body green, shroud black, key-up/key-down, SM OS2 UPC, polarity AS	85072961
Transition module, double size, Base-12, front 12 × LCD adapter green, rear 2 × MTP12, pinned, adapter body green, shroud black, key-up/key-down, SM OS2 APC, polarity AS	85073365
Transition module, double size, Base-12, front 12 × LCD adapter green, rear 2 × MTP12, pinned, adapter body green, shroud black, key-up/key-down, SM OS2 APC, polarity AP	85072962



Description	ltem no.
Transition module, double size, Base-24, front 12 × LCD adapter aqua, rear 1 × MTP24, non-pinned, adapter body black, shroud red, key-up/key-down, MM OM3, polarity R1 split fibers per row	85072963
Transition module, double size, Base-24, front 12 × LCD adapter heather violet, rear 1 × MTP24, non-pinned, adapter body black, shroud red, key-up/key-down, MM OM4, polarity R1 split fibers per row	85072964

IANOS Base-12 MTP-SC Transition Module



Characteristics

- Transition double module 1 x MTP12 to 12 x SC simplex
- Fast and tool-less installation
- Facilitates patching to transceiver
- Compact and robust plastic construction
- Low insertion loss design
- Available in Singlemode APC and Multimode OM4 performance
- Compatible with all IANOS chassis
- Color coded MTP adapters

Technical data

Attribute		Value
Product family		IANOS
Suitable for		All IANOS chassis
Dimensions ($W \times D \times H$)		Double module 7.71 × 6.77 × 0.46 in
Material		PC/ABS
Color		black (RAL 9005)
Number of adapters	front	12 x SC simplex
	rear	1 x MTP12
Adapter types	front	SC simplex
	rear	MTP12 Type A (Key Up / Key Down)
Adapter colors	front	Black (SM/APC)/ (MM/OM4/UPC)
	rear	Green adapter with black shroud (MTP12)
Ferrule	SC	zirconia ceramic
	MTP	composite / male gender

Optical data

Attribute	Value
Fiber count	Double module: 12
Fiber type	Singlemode 9/125 μm APC Multimode 50/125 μm OM4
Module insertion loss	SM APC: ≤0.50 dB MM OM4: ≤0.35 dB
Module return loss	SM OS2 APC: ≥60 dB MM OM4: ≥30 dB
Free of halogen	yes
2011/65/EC (RoHS)	fully compliant

IANOS Base-12 MTP-SC Transition Module



Description	ltem no.
Base-12 MTP-SC transition double module, SM APC, 1 x MTP12 pinned (rear) - 12 x SC simplex, polarity AS	85083804
Base-12 MTP-SC transition double module, SM APC, 1 x MTP12 pinned (rear) - 12 x SC simplex, polarity AP	85085506
Base-12 MTP-SC transition double module, OM4 UPC, 1 x MTP12 pinned (rear) - 12 x SC simplex, polarity AS	85083808
Base-12 MTP-SC transition double module, OM4 UPC, 1 x MTP12 pinned (rear) - 12 x SC simplex, polarity AP	85085505

IANOS MTP Conversion Modules



Characteristics

- Converts Base-8, 12 and 24 backbones
- Fast and tool-less installation
- Facilitates patching to transceiver
- Available as single module only
- Available in Multimode OM3/OM4 performance
- Compatible with IANOS 1U/4U and zero space chassis
- Color coded MTP adapter shrouds by Base-type

IANOS conversion modules provide an easy upgrade path for users who want to convert their pre-installed MTP backbone cables to match new transceiver requirements. This process allows users to get full fiber utilization from their existing backbones. 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).

Technical data

Attribute		Value
Suitable for		all IANOS chassis
Dimensions ($W \times D \times H$)		3.8 × 6.5 × 0.5 in
Material		PC/ABS
Color		black (RAL 9005)
Adapter types	front	MTP 8, 12 or 24 (key-up/key-down)
	rear	MTP 8, 12 or 24 (key-up/key-down)
Adapter Colors	front/rear	black adapter with gray shroud (MTP8)
	front/rear	black adapter with black shroud (MTP12)
	front/rear	black adapter with red shroud (MTP24)
Ferrule	MTP	composite (male/female)

Optical data

Attribute	Value
Fiber type	Multimode 50/125 µm OM3 Multimode 50/125 µm OM4
Module insertion loss	MM OM3: ≤ 0.50 dB MM OM4: ≤ 0.50 dB
Module return loss	MM OM3: ≥ 30 dB MM OM4: ≥ 30 dB

Key Features Conversion Modules

100 % utilization of existing backbone

Conversion modules allow users to reuse their existing backbone cables even though the MTP connectivity does not match their new equipment. Therefore Base-12 backbone cables can be converted to Base-8 or Base-24 depending on the required data rate.



Patch directly to nearby equipment

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IANOS conversion modules are the preferred conversion method for many operators because MTP jumpers can be used to connect directly from the module to nearby equipment. Generally the conversion module will have a male connector at the front which allows for female to female patch cords.

damaging the transceiver with a pinned connector.

This makes the management of patch cords easier and prevents any risk of



IANOS MTP Conversion Modules



Ordering information

Description	ltem no.
Conversion module, single size, Base-8, front 1 × MTP24 pinned, adapter body black, shroud red, key-up/key-down, rear 3 × MTP8, non-pinned, adapter body black, shroud gray, key-up/key-down, OM3, polarity S0 split fibers per row	85073360
Conversion module, single size, Base-8, front 1 × MTP24 pinned, adapter body black, shroud red, key-up/key-down, rear 3 × MTP8, non-pinned, adapter body black, shroud gray, key-up/key-down, OM4, polarity S0 split fibers per row	85073361



Ordering information

Description	ltem no.
Conversion module, single size, Base-12, front 6 × MTP8 pinned, adapter body black, shroud gray, key-up/key-down, rear 4 × MTP12, pinned, adapter body black, shroud black, key-up/key-down, OM3, polarity S2 split fibers per row	85072948
Conversion module, single size, Base-12, front 6 × MTP8 pinned, adapter body black, shroud gray, key-up/key-down, rear 4 × MTP12, pinned, adapter body black, shroud black, key-up/key-down, OM4, polarity S2 split fibers per row	85072951
Conversion module, single size, Base-12, front 2 × MTP24 pinned, adapter body black, shroud red, key-up/key-down, rear 4 × MTP12, pinned, adapter body black, shroud black, key-up/key-down, OM4, polarity S1 split fibers per row	85072949
Conversion module, single size, Base-12, front 2 × MTP24 pinned, adapter body black, shroud red, key-up/key-down, rear 4 × MTP12, pinned, adapter body black, shroud black, key-up/key-down, OM3, polarity S1 split fibers per row	85073362



Description	ltem no.
Conversion module, single size, Base-24, front 6 × MTP8 pinned, adapter body black, shroud gray, key-up/key-down, rear 2 × MTP24, non-pinned, adapter body black, shroud red, key-up/key-down, OM3, polarity S4 split fibers per row	85072950
Conversion module, single size, Base-24, front 6 × MTP8 pinned, adapter body black, shroud gray, key-up/key-down, rear 2 × MTP24, non-pinned, adapter body black, shroud red, key-up/key-down, OM4, polarity S4 split fibers per row	85072953



IANOS Splicing Modules



Characteristics

- 24 LC splicing /12 SC splicing
- Fast splicing and reduced coiling time
- Cover with fiber identification
- Quick access to fiber
- Fast cable attachement for incoming cables (2, 3 and 5 mm)
- Suitable for 5 mm conduit
- Bend radius control throughout (min. 1.2 in)
- Fiber over-length storage with integral heat shrink or optional sandwich splice comb
- Available in Singlemode OS2 and Multimode OM3/OM4 performance
- Compatible with IANOS 1U/4U and zero space chassis
- Color coded LC adapters by performance
- 24 individual or 4 ribbon heat shrink splices

Technical data

Attribute		Value
Suitable for		chassis/zero space chassis
Dimensions ($W \times D \times H$)		5.1 × 5.4 × 1.9 in
Material		PC/ABS
Color		black (RAL 9005)
Adapter types	front	LC duplex SC simplex
	rear	cable fixation
Adapter Colors	front blue (SM/UPC) green (SM/APC) aqua (MM/OM3) heather violet (MM/OM4)	
	rear	n/a
Ferrule	lC/SC	zirconia ceramic

Optical performance

Туре	Measurement method (IL/RL)	IL (dB)	RL (dB)
SM UPC	IL: IEC 61300-3-4 method B	≤0.30	≥ 50
SMAPC	RL: IEC 61300-3-6	≤0.30	≥65
MM OM3	IL: IEC 61300-3-34 method B	≤0.25	≥ 35
MM OM4	RL: IEC 61300-3-6	≤ 0.15	≥ 35

Key Features Splicing Modules

Clear routing and separation of incoming and outgoing fibers

The IANOS splicing module incorporates two independent storage areas which keep incoming and outgoing fibers separate from each other. This feature simplifies the splicing process and reduces the time required for installation and maintenance.



Fast cable attachement

The IANOS splicing module allows users to attach cables simply by clamping the outer jacket of the cable. This innovative feature eliminates the need for cable ties or other wrap-around ties that can cause damage to the cable. Additional kevlar fixation is available inside the module to provide additional strain relief and security. The IANOS module is designed for HUBER+SUHNER cable systems with a diameter of 2 mm, 3 mm and 5 mm. Protective conduit can also be fixed to the rear of the module if required.



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Up to 24 heat-shrink splices per module

The IANOS splicing module is a double module which facilitates the fusion splicing of 24 individual heat or 4 ribbon heat shrink splices. The splicing module is suitable for all HUBER+SUHNER 8, 12 and 24 strand cables.



IANOS Splicing Modules



Description					
Splice module, double size, Base-2, front 12 × LC duplex adapter blue (SM/UPC)					
Splice module, double size, Base-2, front 12 × LC duplex adapter green (SM/APC)					
Splice module, double size, Base-2, front 12 × LC duplex adapter aqua (MM/OM3)					
Splice module, double size, Base-2, front 12 × LC duplex adapter heather violet (MM/OM4)					
Splice module, double size, Base-1, front 12x SC simplex adapter black (SM/APC)					
Splice module, double size, Base-1, front 12x SC simplex adapter black (SM/UPC)					
Splice module, double size, Base-1, front 12x SC simplex adapter black (MM/OM4)					





19" Fiber Panels

Both Fiberframe and Fiberframe Lite are 19" fiber panels which allow the user to splice or patch various cables in a standard 1U 19" frame. The Fiberframe is a lightweight aluminium construction, while Fiberframe Lite is a solid steel construction. Both can accommodate up to 24 adapters such as LC and SC. In addition, maximum flexibility for the Fiberframe is ensured thanks to exchangeable front plates for a wide range of supplementary adapter types.

The panels have a density of up to 48 fibers and allow the user to bring various different cables into the back of the panel – Fiberframe Lite with a multifunctional back plate and Fiberframe with exchangeable back plates. Both panels have a telescopic drawer, which ensures access to the back of the connectors and to the splice cassettes. The Fiberframe has an additional loose tube storage area which is separated from the splicing and patching area inside the panel.

For splice applications, the well-known ACS splice cassette accommodates up to 24 fibers per cassette using either heat shrink or sandwich splice protectors. The cassette allows the user to store fiber overlength neatly and securely within the cassette and the hinge mechanism ensures the access to any cassette without tools.

Fiberframe



Characteristics

- Standard 19" 1U size
- Lightweight aluminium construction
- Telescopic drawer with tilt of 25°
- Up to 48 fibers per 1U
- Separate storage area for loose tubes and pigtails inside the panel
- 2 perforated plates integrated in the rear of the panel
- Additional exchangeable adapter plates for different cable systems available
- Moveable brackets for either even, reset or salient mounting
- ACS splice cassette technology accepting up to 24 fibers per cassette
- Color coded pigtails are standard
- Optional zero space cable management bar

Patching and splicing within a lightweight aluminium patch panel

Each panel is delivered with a mounting kit (M5), designation strip, Velcro straps and cable ties.

Technical data

Attribute	Value
Dimensions ($W \times D \times H$)	17.3 × 7.9 (9.1) × 1.7 in
Drawer tilt (pulled out)	25°
Mounting positions	-2.0 to +3.0 in (1.0 in steps)
Rack height unit	10
Adapter types	LC, LX.5, SC
Capacity	48 fibers with LC/LX.5 connectivity 24 fibers with SC connectivity
ACS splice cassette capacity	24 splices with heat shrink or sandwich splice protection technology, with storage area for bare fibers
Loose tube storage area	yes, in bottom of drawer
Material	anodized aluminium
Weight (empty)	3.20 lb
Color	aluminium silver
Free of halogen	yes
2011/65/EC (RoHS)	fully compliant

Fiberframe

Fiberframe - unpopulated



Description	ltem no.
For 24 × LC duplex or LX.5 duplex (1 to 48 numbering)	85063207
For 24 × LC duplex, LX.5 duplex or SC simplex (1 to 24 numbering)	85063208

Fiberframe, patch variant - including flangeless adapters



Ordering information

Description	ltem no.
24 × LC duplex adapters, blue	85063212
24 × LC duplex adapters, green	85063213
24 × LC duplex adapters, beige	85063214
24 × SC simplex adapters, blue	85063215
24 × SC simplex adapters, green	85063216

Fiberframe, splice variant – including flangeless adapters, pigtails, splice cassettes and splice protector holders (sandwich/heat shrink)



Description				
24 × LC duplex adapters, blue, with 48 × LC/UPC SM standard pigtails, DIN color code				
24 × LC duplex adapters, green, with 48 × LC/APC SM standard pigtails, DIN color code				
24 × SC simplex adapters, blue, with 24 × SC/UPC SM standard pigtails, DIN color code				
24 × SC simplex adapters, green, with 24 × SC/APC SM standard pigtails, DIN color code				

Fiberframe - Accessories

Back plates and cable glands

Ordering information

Description	Packing unit	Order unit (multiple of)	ltem no.	Picture
Entry plate suitable for 1 × M25 cable gland	1	1	85033023	[
Entry plate suitable for 1 × M20 cable gland and 2 × SC shaped connectors	1	1	85033024	
M20 × 1.5 cable gland for cables with diameter 7.0 to 13.0 mm	1	1	84118394	-0
M20 locknut	1	1	85068092	
M25 × 1.5 cable gland for cables with diameter 9.0 to 17.0 mm	1	1	84039078	Ch -
M25 locknut	1	1	85064421	

Splice accessories

Description	Packing unit	Order unit (multiple of)	Item no.	Picture
ACS splice cassette accepting up to 24 splices	1	1	84123330	
ACS splice cassette cover	1	1	84123617	
Sandwich splice protector holder, 24 way	1	1	84103969	
Shrink splice protector holder, 24 way	1	1	84123618	

Fiberframe - Accessories

Splice accessories (continuing)

Ordering information

Description	Packing unit	Order unit (multiple of)	ltem no.	Picture
Heat shrink splice protector, dimension: diameter 1.5 × 40 mm	100	100	84059763	
Sandwich splice protector, dimension: 1.2 × 3.2 × 30 mm	150	150	23218558	

Cable management

Description	Packing unit	Order unit (multiple of)	Item no.	Picture
Patch cord management bar and front door	1	1	85063160	
Patch cord management bracket, gray /blue	1	1	84093679	

Fiberframe Lite



Characteristics

- Standard 19" 1U size
- Robust steel construction
- Telescopic drawer with tilt of 15°
- Multifunctional back plate
- Up to 48 fibers per 1U
- ACS splice cassette technology accepting up to 24 fibers per cassette
- Optional zero space cable management bar

Flexible fiber management

Each panel is delivered with a mounting kit (M5), Velcro straps and cable ties.

Technical data Attribute Value 17.6 x 7.9 x 1.7 in Dimensions ($W \times D \times H$) Drawer tilt (pulled out) 15° Rack height unit 1U LC, SC, LX.5 Adapter types 48 fibers with LC/LX.5 connectivity Capacity 24 fibers with SC connectivity 2 ACS splice cassettes including pigtail management 24 splices with heat shrink or sandwich splice protection technology, with storage area for bare fibers ACS splice cassette capacity Material steel powder coated 5.29 lb Weight (empty) gray (RAL 7035) Color Free of halogen yes 2011/65/EC (RoHS) fully compliant

Fiberframe Lite - Unpopulated



Ordering information	
Description	ltem no.
For 24 × LC duplex, or SC simplex	85063206

Fiberframe Lite, patch variant – including flangeless adapters



Ordering information

Description	ltem no.
24 × LC duplex adapters, blue	85063226
24 × LC duplex adapters, green	85063227
24 × LC duplex adapters, beige	85063228
24 × SC simplex adapters, blue	85063229
24 × SC simplex adapters, green	85063231

Fiberframe Lite, splice variant – including flangeless adapters, pigtails, splice cassettes and splice protector holders (sandwich/heat shrink)



Description	ltem no.
24 × LC duplex adapters, blue, with 48 × LC/UPC SM standard pigtails, no color coding	85063232
24 × LC duplex adapters, green, with 48 × LC/APC SM standard pigtails, no color coding	85063236
24 × SC simplex adapters, blue, with 24 × SC/UPC SM standard pigtails, no color coding	85064745
24 × SC simplex adapters, green, with 24 × SC/APC SM standard pigtails, no color coding	85064746

Fiberframe Lite - Accessories

Splice accessories

Ordering information

Description	Packing unit	Order unit (multiple of)	ltem no.	Picture
ACS splice cassette accepting up to 24 splices	1	1	84123330	
ACS splice cassette cover	1	1	84123617	
Sandwich splice protector holder, 24 way	1	1	84103969	
Shrink splice protector holder, 24 way	1	1	84123618	
Heat shrink splice protector, dimension: diameter 1.5 × 40 mm	100	100	84059763	
Sandwich splice protector, dimension: 1.2 × 3.2 × 30 mm	150	150	23218558	

Cable management

Description	Packing unit	Order unit (multiple of)	ltem no.	Picture
Patch cord management bar	1	1	85063160	
Patch cord management bracket, gray /blue	1	1	84093679	
$M20 \times 1.5$ cable gland for cables with diameter 7.0 to 13.0 mm	1	1	84118394	
M20 locknut	1	1	85068092	
M25 \times 1.5 cable gland for cables with diameter 9.0 to 17.0 mm	1	1	84039078	
M25 locknut	1	1	85064421	

Zone Distribution Panel for High Density Modules (ZDPHD)



Characteristics

- Offers high density of 144 fibers or 24 Keystone type RJ-45 jacks in 1U space
- Up to 4 × high density MTP modules or high density universal adapter plates
- Up to 2 × RJ-45 modules
- Mix and match fiber and copper technology in the same panel
- Optional rear cable manager for cable overlength storage
- Access and installation of modules/plates from the front side
- Optional radius guides for patch cord support and bend radius protection
- Designed for maximum flexibility

Unrivalled density in 1U of space

The high density zone panel can accommodate up to four high density MTP modules (MTHDM), four high density universal adapter plates (HDUAP) or two RJ-45 modules in a single 1U rack space (unused spaces can be fitted with blanking plates) and is normally positioned at the top of server or switch cabinets. The HD panel provides unrivalled patching density and requires no complex pivoting mechanism to gain access to the connectors. This is possible because the HD module utilizes HUBER+SUHNER's revolutionary LC-XD connector which improves access to the connections even when the panel is in a static position. Both fiber and copper technologies can also be interchanged within the same panel to ensure maximum flexibility in a 1U space.

Easy access pivoting cable manager

An additional cable manager can be fitted to the rear of the panel which allows excess cable to be stored and routed safely away to the sides of the equipment cabinet. The cable manager can be retrofitted if required and a pivoting function makes installation and access faster and easier.

Technical data

Attribute	Value
Dimensions ($W \times D \times H$)	17.4 × 5.7 × 1.7 in
Capacity	4 × MTHDM modules, HDUAP or blanking plates 2 × RJ-45 modules
Material	steel and aluminium powder coated
Weight	2.16 lb
Color	black (RAL 9005)
Free of halogen	yes
2011/65/EC (RoHS)	fully compliant

Description	ltem no.
Zone distribution panel for high density modules, black	84146158
MTP® Modules High Density



Characteristics

- Robust metal construction
- Capacity of 12 or 18 ports
- Available in all performances: singlemode and multimode (OM3/OM4)
- Produced with low-bend fiber
- Port identification front and top
- Available with LC duplex
- Up to 144 fibers per 1U HD panel
- Fast tool-less installation
- Factory tested plug and play system
- Compatible with the HD zone distribution panel (ZDP) and zero space brackets

Highest density presentation for in-rack distribution

The MTP HD module is the highest density module currently available on the market. This compact unit acts as a termination point inside or close to equipment racks. MTP connectors on the rear side fan out to 12 or 18 LC duplex/SC simplex adapters on the front side. This means that patch cords can be connected from the front of the module to equipment ports in the same or adjacent racks.

Technical data

Attribute		Value
Dimensions ($W \times D \times H$)		8.4 × 5.0 × 0.8 in
Adapter types (front)		LC duplex, SC simplex
Capacity	front of module back of module	12 or 18 LC duplex or SC simplex adapters 2 or 3 MTP connectors
Material		aluminium powder coated
Color		black (RAL 9005)
Free of halogen		yes
2011/65/EC (RoHS)		fully compliant

Description	Performance	ltem no.
High density MTP module, black, 24 fiber 2 × MTP12 male, standard ferrule, 12 LC duplex ports, polarity A	SM	85014130
High density MTP module, black, 24 fiber 2 × MTP12 male, elite ferrule, 12 LC duplex ports, polarity A	SM	84150020
High density MTP module, black, 36 fiber 3 × MTP12 male, standard ferrule, 18 LC duplex ports, polarity A	SM	85014129
High density MTP module, black, 36 fiber 3 × MTP12 male, elite ferrule, 18 LC duplex ports, polarity A	SM	84148469
High density MTP module, black, 24 fiber 2 × MTP12 male, elite ferrule, 12 LC duplex port, polarity A	OM3	84150022
High density MTP module, black, 36 fiber 3 × MTP12 male, elite ferrule, 18 LC duplex ports, polarity A	OM3	84150024
High density MTP module, black, 24 fiber 2 × MTP12 male, elite ferrule, 12 LC duplex ports, polarity A	OM4	84150025
High density MTP module, black, 36 fiber 3 × MTP12 male, elite ferrule, 18 LC duplex ports, polarity A	OM4	84148468

HDUAP Universal Adapter Plates



Characteristics

- Capacity 12 or 18 SC-shaped adapters (MTP/LC duplex/SC simplex)
- Compact and robust
- Fast installation with snap-fixation
- Port numbering for easy identification
- Compatible with the HD zone distribution panel (ZDPHD) and zero space brackets

High density patching panels

High density universal adapter plates are supplied pre-loaded with adapters and can be fitted to any panel that accepts the high density MTP modules. This allows adapter plates, modules and blanking plates to be interchanged in the same panel if desired. Adapter plates are generally used in combination with ruggedized fan-outs where the fan-out connects to the rear side of the plate and patch cords connect to equipment ports on the front side. Blank versions of the plate are also available in situations where panel positions are to be reserved for later use.

When building an MTP link, HDUAP plates are pre-loaded with MTP adapters so that incoming link assemblies can be connected with fan-outs directly to equipment ports. In 40G and 100G applications, the pre-loaded HDUAP will act as a patching area where MTP patch cords can be connected directly to multi-fiber transceivers.

Attribute	Value	
Dimensions ($W \times D \times H$)	8 × 1 × 0.83 in	
Adapter types	LC duplex, SC simplex, MTP	
Capacity	12 or 18 LC duplex/SC simplex/MTP adapters	
Material	aluminium powder coated	
Color	black (RAL 9005)	
Free of halogen	yes	
2011/65/EC (RoHS)	fully compliant	

Technical data

Description	Performance	ltem no.
HDUAP, black, fitted with 18 LC duplex adapters (blue)	SM/UPC	85009702
HDUAP, black, fitted with 18 LC duplex adapters (aqua)	OM3/OM4	85018189
HDUAP, black, fitted with 18 MTP adapters (blue)	SM/UPC	85018176
HDUAP, black, fitted with 18 MTP adapters (black)	OM3/OM4	85014434

Blanking Panels



Characteristics

- Fit to any space where MTHDM modules or HDUAP plates are used
- Aluminium construction
- Fast installation with snap-fixation
- Prevent cold and hot airflow mixing

Airflow Management

The blanking panels can be used as placeholders and will fit into any empty space where HDUAP panels fit. The blanking panels also block airflow leakage, supporting the hot aisle/cold aisle infrastructure. The blanking panels can be replaced with connectivity modules/panels quickly and easily.

Technical data

Attribute	Value
Dimensions ($W \times D \times H$)	for MTHDM/HDUAP spaces: 8 × 0.39 × 0.83 in
Compatibility	with all spaces for MTHDM modules and HDUAP plates
Material	aluminium powder coated
Color	black (RAL 9005)
Free of halogen	yes
2011/65/EC (RoHS)	fully compliant

Description	ltem no.
Universal high density blanking plate, black, suitable with ZDPHD	84148846

Rear Cable Manager for ZDPHD



Characteristics

- Retrofittable
- Suitable for ZDPHD
- Pivoting for easy access to MTP connectors
- 1.4 in minimum bend radius
- 10
- Robust steel and aluminium construction

Easy access pivoting cable manager

An additional cable manager can be fitted to the rear of the panel which allows excess cable to be stored and routed safely away to the sides of the equipment cabinet. The cable manager can be retrofitted if required and a pivoting function makes installation as well as access faster and easier.

Technical data

Attribute	Value
Dimensions ($W \times D \times H$)	17.52 × 8.36 × 1.54 in
Suitable for	ZDPHD
Material	steel and aluminium powder coated
Weight	1.98 lb
Color	black (RAL 9005)
Free of halogen	yes
2011/65/EC (RoHS)	fully compliant

Description	ltem no.
Rear cable manager, black, retrofittable, suitable for ZDPHD	84146157

Front Door for all ZDPHD Panels



Ordering information

Description	ltem no.
Front door with locking mechanism, black, retrofittable, for all ZDPHD panels	85030404

Patch Cord Retainer



Characteristics

- Guides patch cords around 19 in vertical rails
- Suitable for standard 19 in fixing holes
- Provides lateral support and strain relief for patch cords
- 10
- Left and right mountable (1.6 in side space required)
- 1.2 in bend radius

Description	Item no.
Patch cord management brackets, black (w/o lateral support), set of 2 pcs	84146159
Patch cord retainer, black/blue	84088889

Patch Cord Guide



Characteristics

- Guides patch cords to the side of the rack
- Suitable for standard 19 in fixing holes
- 10
- Rapstrap tie can be added
- Left and right mountable
- 1.2 in bend radius

Ordering information

Description	ltem no.
Patch cord guide, black/blue	84093678

Rapstrap



Characteristics

- Flexible and extremely strong
- Moulded plastic creates no debris
- Reduces chance of cable jacket damage or fiber micro/macro-bending
- Re-useable (simply cut with scissors)
- Suitable for fiber cables and patch cords
- Color black

Description	ltem no.
Rapstrap cable tie, 48 pcs.	85004339





Connectors and Cable Assemblies



Connectors and Cable Assemblies

MTP forming the backbone of structured cabling solutions

High density fiber management systems and the increased use of MTP connectivity has led to the need for smaller more flexible backbone cables. Available in fiber counts up to 144 fibers, HUBER+SUHNER's MTP trunks reduce the installation time by consolidating multiple sub-units into a single cable. This approach significantly reduces the overall diameter of the cable and provides much better space utilization of cable routing channels.

SC patch cords/pigtails

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The SC connector is one of the most common solutions for reliable networks. With the big form ferrule, this connector ensures a reliable optical connection with good mechanical stability. Its push-pull design prevents rotational misalignment. A clip is available for duplex setup, and polarity flipping is accomplished without a tool.

LC-XD for unrivalled density and fast moves, adds and changes

HUBER+SUHNER developed the world's first push-pull LC connector to provide faster moves, adds and changes and unrivalled density. The LC-XD uniboot connector has an extraction pin at the rear of the shroud that can be accessed by installers quickly and easily even in the most congested of patching fields. Many of our competitors recommend tools to remove connectors from high density cross-connects or SAN switches but at HUBER+SUHNER, we believe that connector innovation lies at the heart of usability.

ST connector and cable assemblies

HUBER+SUHNER is pleased to offer ST connector based custom cable assemblies. The one piece design for quick and easy termination, based on the bayonet nut connector, provides ST-security coupled with integrated strain relief.







Field Terminated Connectors

LC Connector, 250µm/900µm



Characteristics

- Mechanical splice using index matching gel
- Perfect stability and reliability
- High performance
- RoHs compliant
- UL94-VO flammability rated
- Compliant to TIA/EIA 568-C.3, IEC-61754-20

Technical data

Description	Connector Type	Polishing	Values
Insertion Loss	Single mode	UPC	Typical: 0.2dB (UPC)
	Single mode	APC	Typical: 0.3dB (APC)
Return Loss	Single mode	UPC	Typical: 55dB (UPC)
	Single mode	APC	Typical: 60dB (APC)

Mechanical data

Description	Values
Operating temperature	-40°C up to +75°C
Durability	<0.1dB change, 500 matings
Tensile load	250µm fiber = 3N
Intermateability	IEC 61754-4
Qualification	TIE/EIA 568-C.3

Ordering information

Description	ltem number
LC Connector UPC, 250µm/900µm	85067428

Termination tools are available on request.

Field Terminated Connectors

SC Connector, 2mm/3mm



Characteristics

- Mechanical splice using index matching gel
- Highly stable and reliable
- Perfect performance
- Compact package
- RoHs compliant
- Finished connector meet UL94-VO flammability rate
- TIA/EIA 568-C.3 compliant

Technical data

Description	Connector Type	Polishing	Values
Insertion Loss	Single mode	UPC	Typical: 0.2dB (UPC)
	Single mode	APC	Typical: 0.3dB (APC)
Return Loss	Single mode	UPC	Typical: 55dB (UPC)
	Single mode	APC	Typical: 60dB (APC)

Mechanical data

Description	Values
Operating temperature	-40°C up to +75°C
Durability	<0.1dB change, 500 matings
Intermateability	IEC 61754-4
Tensile	TIE/EIA 568-C.3

Ordering information

Description	Item number
SC Connector UPC, 2mm/3mm	85067430
SC Connector APC, 2mm/3mm	85067432

Termination tools are available on request.

Customized Cable Assemblies





Customized Cable Assemblies

Custom Cable assemblies from HUBER+SUHNER are available in a variety of different configurations designed and manufactured to meet your specific needs. Whether it is MTP, SC, LC or LX.5 or any combination of these, HUBER+SUHNER can configure and manufactures customer specific cable assemblies solutions.

MTP Trunk Assemblies



Characteristics

- Available with 8, 12 and 24 fiber strand sub-units
- Small outer-diameter cable for space saving
- Terminated with MTP® connectors for 10G, 40G and 100G applications
- Lightweight construction suitable for easy installation
- Customer specific cable and fan-out lengths available
- Bend-optimized fiber as standard
- Braided sock as connector protection/pulling aid
- Color coded MTP boots for easy and fast identification (MTP-8, -12, -24)
- Available in plenum, riser, and general purpose rating

HUBER+SUHNER trunk cables are high density multi-stranded cables which form the backbone of your network. Available in fiber counts up to 144 fibers, the HUBER+SUHNER trunks reduce the installation time by consolidating multiple sub-units into a single cable. This approach significantly reduces the overall diameter of the cable and provides much better space utilization of cable routing channels.

HUBER+SUHNER trunk cables are available with 8, 12 and 24 fiber sub-units so that users can deploy Base-8, Base-12 or Base-24 infrastructures to suit their MTP connectivity requirements.

Base-8 HUBER+SUHNER trunk cables

Base-8 HUBER+SUHNER trunks allows users to build 10G links today which can easily be upgraded to 40G links tomorrow using 8 fiber MTP connectivity.

Base-12 HUBER+SUHNER trunk cables

Base-12 HUBER+SUHNER trunks allows users to build 10G links today which can easily be upgraded to 40G or 100G links tomorrow using conversion modules, harnesses or patch cables.

Base-24 HUBER+SUHNER trunk cables

Base-24 HUBER+SUHNER trunks allows users to build 10G links today which can easily be upgraded to 40G or 100G links tomorrow by using conversion modules, conversion harnesses or patch cables.

Technical data

General specification							
Application		backbone trunk connections					
Fiber type	OS2	E9/125					
	OM3	G50/125 - OM3					
	OM4	G50/125 - OM4					
Cable jacket color	OS2	yellow					
	OM3	adna					
	OM4	adna					

Construction							
Connectors	Side A	MTP 8/12/24 fibers (male/female)					
	Side B	MTP 8/12/24 fibers (male/female)					

MTP Trunk Assemblies

Technical data

Optical performance	Tested acc. to	Condition	Values
Connector insertion loss	IEC 6111.8-3-4		< 0.35 dB
Return loss	IEC 6111.8-3-6	SM	> 60 dB
		OM3	> 30 dB
		OM4	> 30 dB

General specification	Condition	8 fiber	12 fiber	24 fiber	48 fiber	72 fiber	96 fiber	144 fiber
Cable diameter (mm)	Base-8	2.0/3.0	n/a	3.0	6.5	n/a	9.9	n/a
	Base-12	n/a	3.0	3.0	6.5	6.5	n/a	9.9
	Base-24	n/a	n/a	3.0	n/a	n/a	n/a	n/a

Environmental data	Tested acc. to	Condition	Values
Temperature range	IEC 6111.8-2-22	during installation	0 to +60°C
		in service	0 to +70°C
		storage conditions	-40 to +70°C

HUBER+SUHNER MTP Trunk Cable Assemblies - Order Code

0	1	2	3	4		5	6	7	8	9		10	11	12	13		14	15	16	17
					-						-					-				

0	Syst	em type
0	, T	All lengths in order code specified in metric units
U	Т	All lengths in order code specified in imperial units
1	Nun	nber of fibers
0	8	Base-8
-	2	Base-12
2	4	Base-24
2	Nun	nber of connectors per side
2		2x MTP connector per side
3		3x MTP connector per side
4		4x MTP connector per side
6		6x MTP connector per side
8		8x MTP connector per side
С		12x MTP connector per side
D		Other number of MTP connector per side
3	Fibe	r allocation
А		Type A polarity
В		Type B polarity
1	Ont	ical performance
4	Opt	ical performance
4 L	Opt	ical performance Low loss (same performance classes for SM and MM) Standard (same performance classes for SM and MM)
4 L S X	Opt	ical performance Low loss (same performance classes for SM and MM) Standard (same performance classes for SM and MM) Non-functional sample
4 L S X	Opt	ical performance Low loss (same performance classes for SM and MM) Standard (same performance classes for SM and MM) Non-functional sample
4 L S X 5	Opt	ical performance Low loss (same performance classes for SM and MM) Standard (same performance classes for SM and MM) Non-functional sample Ile jacket rating
4 L S X 5 P	Opt	ical performance Low loss (same performance classes for SM and MM) Standard (same performance classes for SM and MM) Non-functional sample le jacket rating NFPA Plenum
4 L S X 5 P R	Opt	ical performance Low loss (same performance classes for SM and MM) Standard (same performance classes for SM and MM) Non-functional sample le jacket rating NFPA Plenum NFPA Riser
4 L S X 5 P R G	Opt	ical performance Low loss (same performance classes for SM and MM) Standard (same performance classes for SM and MM) Non-functional sample le jacket rating NFPA Plenum NFPA Riser NFPA General Purpose
4 L S X 5 P R G B	Cab	ical performance Low loss (same performance classes for SM and MM) Standard (same performance classes for SM and MM) Non-functional sample le jacket rating NFPA Plenum NFPA Riser NFPA General Purpose CPR B2ca rated LSFH (low smoke free of halogen) and self-extinguishing cable
4 L S X 5 P R G B 6	Cab	ical performance Low loss (same performance classes for SM and MM) Standard (same performance classes for SM and MM) Non-functional sample le jacket rating NFPA Plenum NFPA Riser NFPA General Purpose CPR B2ca rated LSFH (low smoke free of halogen) and self-extinguishing cable le type
4 L S X 5 P R G B 6 A	Cab	ical performance Low loss (same performance classes for SM and MM) Standard (same performance classes for SM and MM) Non-functional sample le jacket rating NFPA Plenum NFPA Riser NFPA General Purpose CPR B2ca rated LSFH (low smoke free of halogen) and self-extinguishing cable le type CPR rated cable with optimized diameter (8/12 fibers: 2mm subunits, 24 fibers: 3mm subunits)
4 L S X 5 P R G B 6 A F	Cab	ical performance Low loss (same performance classes for SM and MM) Standard (same performance classes for SM and MM) Non-functional sample le jacket rating NFPA Plenum NFPA Riser NFPA General Purpose CPR B2ca rated LSFH (low smoke free of halogen) and self-extinguishing cable le type CPR rated cable with optimized diameter (8/12 fibers: 2mm subunits, 24 fibers: 3mm subunits) Indoor multi-unit small and lightweight cable, 12-144 fiber
4 L S 7 P R G B B 6 A F G	Cab	ical performance Low loss (same performance classes for SM and MM) Standard (same performance classes for SM and MM) Non-functional sample le jacket rating NFPA Plenum NFPA Riser NFPA General Purpose CPR B2ca rated LSFH (low smoke free of halogen) and self-extinguishing cable le type CPR rated cable with optimized diameter (8/12 fibers: 2mm subunits, 24 fibers: 3mm subunits) Indoor multi-unit small and lightweight cable, 12-144 fiber Indoor armored micro distribution cable, 24-144 fiber
4 L S X 5 P R G B 6 A F G 7	Opt	ical performance Low loss (same performance classes for SM and MM) Standard (same performance classes for SM and MM) Non-functional sample le jacket rating NFPA Plenum NFPA Riser NFPA General Purpose CPR B2ca rated LSFH (low smoke free of halogen) and self-extinguishing cable le type CPR rated cable with optimized diameter (8/12 fibers: 2mm subunits, 24 fibers: 3mm subunits) Indoor multi-unit small and lightweight cable, 12-144 fiber Indoor armored micro distribution cable, 24-144 fiber
4 L S X F R G B 6 A F G 7 O	Cab	ical performance Low loss (same performance classes for SM and MM) Standard (same performance classes for SM and MM) Non-functional sample le jacket rating NFPA Plenum NFPA Riser NFPA General Purpose CPR B2ca rated LSFH (low smoke free of halogen) and self-extinguishing cable le type CPR rated cable with optimized diameter (8/12 fibers: 2mm subunits, 24 fibers: 3mm subunits) Indoor multi-unit small and lightweight cable, 12-144 fiber Indoor armored micro distribution cable, 24-144 fiber SM E9/125
4 L S 7 P R G B B 6 A F G 7 0 3	Cab	ical performance Low loss (same performance classes for SM and MM) Standard (same performance classes for SM and MM) Non-functional sample le jacket rating NFPA Plenum NFPA Riser NFPA General Purpose CPR B2ca rated LSFH (low smoke free of halogen) and self-extinguishing cable le type CPR rated cable with optimized diameter (8/12 fibers: 2mm subunits, 24 fibers: 3mm subunits) Indoor multi-unit small and lightweight cable, 12-144 fiber Indoor armored micro distribution cable, 24-144 fiber Type SM E9/125 MM G50/125 OM3

8	Cab	le length (divider to divider)
n n	n	- product code starting with OT: unit in meters
		- product code starting with UT: unit in feet
9	Pac	kaging option
D		Standard packing (cardboard)
F		Particle-free packing (plastic)
Ζ		Custom packaging
10	Fan	out A-Side
5		Type 5 fan-out (equal length)
Ζ		Custom fan-out
11	Fan	-out side A, length (divider to connector)
n n	n	Longest fan-out side A
		- product code starting with OT: unit in cm
		- product code starting with UT: unit in inch
10	F	·
	ran	
171		Mill connector
13	Fan	out side A, connector type
Μ		MTP male connector (pinned)
F		MTP female connector (non-pinned)
14	Fan	out side B
0		No fan-out (for splice version)
5		Type 5 fan-out (equal length)
Ζ		Custom fan-out
15	Fan	out side B, length (divider to connector)
n n	n	Longest fan-out side B
		- product code starting with OT: unit in cm
		- product code starting with UT: unit in inch
16	Fan	out side B, connector
0		No connector (for splice version)
Μ		MTP connector
17	Fan	out side B, connector type
0		No connector (for splice version)
Μ		MTP male connector (pinned)
F		MTP female connector (non-pinned)

Order Code Example MTP-MTP Trunk Cable Assemblies



Example	UT126AL-GF-0025D-5024MF-5024MF
Harness type	Trunk Base-12, 6X12f, Type A fiber allocation, std. packaging
Cable	SM, 25 ft length, indoor multi-unit small and lightweight cable, general purpose (NFPA)
Fan-out side A	Type 5, equal length fan-out, 24 in, MTP female
Fan-out side B	Type 5, equal length fan-out, 24 in, MTP female

MTP-LC Harness



HUBER+SUHNER plug and play harnesses provide a transition from MTP connectivity in the backbone to LC duplex connectivity at the switches and servers. Instead of using LC patch panels and cords, the harness provides a fast and compact alternative that plugs directly into equipment transceivers.

Many networks today are designed with multimode MTP backbones because this is the most flexible and future-proofed way of adapting from one type of connector to another.

Although LC connectivity is still used for 1G and 10G Ethernet applications and 4G, 8G, 16G and 32G fiber channel applications, in the future this will change to MTP connectors that deliver higher data rates over parallel fiber lanes.

Technical data		
General specification		
Application		network equipment connections
Fiber type	OS2	E9/125
	OM3	G50/125 - OM3
	OM4	G50/125 - OM4
Cable type		Indoor cable – strain relieved aramid yarn
Cable jacket color	OS2	yellow
	OM3	aqua
	OM4	adna

MTP-LC Harness

Construction		
Connectors	A-Side	MTP (female/male)
	B-Side	LC-XD (Uniboot)
Furcation/fan-out shortest/longest length	A-Side	no furcation
	B-Side	furcation fan-out LC-XD
Fiber allocation	HUBER+SUHNER specific	neutral straight/neutral pair-flip

Optical performance		Tested acc. to	Option	Values
Insertion loss	MTP	IEC 61300-3-4 B *		< 0.35 dB
	LC	IEC 61300-3-4 B	SM	< 0.30 dB
			OM3	< 0.25 dB
			OM4	< 0.15 dB
Return loss	MTP	IEC 61300-3-6	SM	> 60 dB
			OM3	> 30 dB
			OM4	> 30 dB
	LC	IEC 61300-3-6	SM APC	> 65 dB
			SM UPC	> 50 dB
			OM3 UPC	> 35 dB
			OM4 UPC	> 35 dB

* Multimode MT elite ferrule as tested with proposed encircled flux launch condition on 50 µm fiber and 850 nm per IEC 61280-4-1. Singlemode MT elite ferrule compliant with IEC 61755-3-31/grade B.

MTP-LC and LC-LC Harness

Fan-outs to match your equipment

HUBER+SUHNER offer harnesses with different staggered lengths so that you can match your harness to the blade orientation and port allocations of the switch. Some blades are vertically orientated and others are horizontal. This change in orientation has an impact on the numbering scheme of the ports and can result in a mismatch between the harness tail length and the port position.

Furthermore, a switch is often fed from two different sides of the rack. In this case fan-out leg 1 may need to be shortest leg on the left side of the switch but the longest leg on the right hand side.

If you are unsure which fan-out configuration is right for your switch, you should choose fan-outs with equal leg lengths or consult your local HUBER+SUHNER representative for further assistance.



Type 4 fan-out	Type 5 fan-out
6-5-4-3-2-1	1-2-3-4-5-6
15 mm staggeringPairwise leg lengthsNo. 1 on longest leg	 Equal leg lengths (max. 100 cm) Used as generic harness for all patching modules (rear patching)



HUBER+SUHNER Harness - Order Code

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

0	Syst	em type		
0	Н	All lengths in order code specified in metric units		
U	Н	All lengths in order code specified in imperial units		
1	Nur	Number of fibers		
0	8	Base-8 (or 4 x Base-2 LC-LC)		
1	2	Base-12 (or 6 x Base-2 LC-LC)		
2	4	Base-24 (or 12 x Base-2 LC-LC)		
2	Fibe	er allocation		
Ν	S	Type N - straight (for Base-8)		
Ν	Ρ	Type N - pair-flipped (for Base-8)		
А	S	Type A- straight (for Base-2 & Base-12)		
А	Р	Type A - pair-flipped (for Base-2 & Base-12)		
R	1	Type R1 (for Base-24)		
3	Opt	ical performance		
L		Low loss (same performance classes for SM and MM)		
S		Standard ECO (same performance classes for SM and MM)		
Х		Non-functional sample		
4	Cab	le jacket rating		
Р		NFPA Plenum		
R		NFPA Riser		
G		NFPA General Purpose		
L		CPR Dca rated LSFH (low smoke free of halogen) and self-extinguishing cable		
5	Cab	le type		
А		CPR rated cable with optimized diameter (8/12 fibers: 2mm subunits, 24 fibers: 3mm subunits)		
В		CPR rated cable with regular diameter (12 fibers: 3mm subunits, 24 fibers: 3.6mm subunits)		
F		Indoor multi-unit small and lightweight cable, 12-144 fiber		
G		Indoor armored micro distribution cable, 24-144 fiber		
6	Fibe	er type		
0		SM E9/125		
3		MM G50/125 OM3		
4		MM G50/125 OM4		
7	Cab	le length (divider to divider - LC / connector to divider - MTP)		
n r	n n	 product code starting with OH: unit in meters product code starting with UH: unit in feet 		
8	Pac	kaging option		
D		Standard packing (cardboard)		
F		Particle-free packing (plastic)		
Ζ		Custom packaging		

9	Fan-	out A-Side
0		No fan-out (MTP side in case of MTP-LC harness)
1		Type 1 fan-out LC (15mm staggering, shortest leg on #1)
2		Type 2 fan-out LC (15mm pairwise staggering, shortest leg on #1)
3		Type 3 fan-out LC (15mm staggering, longest leg on #1)
4		Type 4 fan-out LC (15mm pairwise staggering, longest leg on #1)
5		Type 5 fan-out LC (equal length)
Ζ		Custom fan-out
10	Fan-	out side A, longest fan-out length (divider to connector)
n n	n	- product code starting with OH: unit in cm
		- product code starting with UH: unit in inch
11	Fan-	out side A, connector
Μ		MTP connector
L		LC duplex connector (LC-XD)
S		SC simplex connector
12	Fan-	out side A, connector type
F		MTP female connecor (non-pinned)
Μ		MTP male connector (pinned)
Р		UPC polish (only applicable for LC)
А		APC polish (only applicable for LC)
13	Fan-	out B-Side
0		No fan-out (for splice version)
1		Type 1 fan-out LC (15mm staggering, shortest leg on #1)
2		Type 2 fan-out LC (15mm pairwise staggering, shortest leg on #1)
3		Type 3 fan-out LC (15mm staggering, longest leg on #1)
4		Type 4 fan-out LC (15mm pairwise staggering, longest leg on #1)
5		Type 5 fan-out LC (equal length)
Ζ		Custom fan-out
14	Fan-	out side B, longest fan-out length (divider to connector)
n n	n	- product code starting with OH: unit in cm
		- product code starting with UH: unit in inch
15	Fan-	out side B, connector
0		No connector (IC to splice harness)
М		MTP connector
L		LC duplex connector (LC-XD)
S		SC simplex connector
16	Fan-	out side B, connector type
0		No connector (LC to splice harness)
F		MTP female connecor (non-pinned)
Μ		MTP male connector (pinned)
Р		UPC polish (only applicable for LC)
А		APC polish (only applicable for LC)

Order Code Example Harness LC to LC



Example	OH12ASL-PF3005F-0000MF-3022LP
Harness type	Harness Base-12, fiber allocation type A-straight, low loss class
Cable	OM3, 5m length, Indoor multi-unit small and lightweight cable, NFPA plenum, particel free packaging
Fan-out side A	No fan-out length, MTP female
Fan-out side B	Type 3, 15cm staggered leg #6, longest leg #1, 22cm length, LC duplex connector (LC-XD)



Choose preferred staggering type for side B

Example	OH12ASL-DB0020F-5070LP-5070LP
Harness type	Optipack harness Base-2 (6x LC duplex), fiber allocation AS, low loss class
Cable	CPR rated optipack cable Dca with optimised diameter, SM, 20meter length, particle-free packing
Fan-out side A	Type 5 fan-out, 70cm lenght (equal), LC duplex connector (LC-XD), PC polish
Fan-out side B	Type 5 fan-out, 70cm lenght (equal), LC duplex connector (LC-XD), PC polish

MTP Patch Cables



Characteristics

- Color coded connector boots by fiber count
- Ultra compact cable diameter
- Bend optimized fiber and flexible construction
- Available as Base-8, -12 or Base-24 types
- Robust construction
- Available in plenum, riser, and general purpose rating

Base-8 MTP patch cables cables

Base-8 MTP patch cables are used to connect fiber optic patch panels with servers and switches in 4-lane parallel architectures. They can also be used to connect two independent trays or modules within centralized cross-connects. Base-8 is the most common interface for 10G data rates and new developments in transceiver technology means that Base-8 could also satisfy 40G, 200G and 400G in the future.

Base-8 patch cables are identified by a gray boot at the rear of the connector so that users do not mistake it for a Base-12 assembly with black boot. Base-8 patch cables are fully compatible with Base-12 patch backbone cables and patch panels, however users should note that 33 % of backbone fibers will be wasted in such a case.

Base-12 MTP patch cables

Base-12 MTP patch cables are used to connect fiber optic patch panels with servers and switches in 4-lane parallel architectures. They can also be used to connect two independent trays or modules within centralized cross-connects. Base-12 patch cables are compatible with Base-8 transceivers, but usage will result in a 33 % fiber wastage because SR4 deployments of 40G only require 8 fibers (4 x lanes).

Base-12 patch cables are identified by a black boot at the rear of the connector so that users do not mistake it for a Base-8 assembly with gray boot. Base-12 patch cables are fully compatible with Base-8 backbone cables and patch panels, however users should note that 33 % of jumper fibers will be wasted in such a case.

Base-24 MTP patch cables

Base-24 MTP patch cables are used to connect fiber optic patch panels with servers and switches in 10-lane parallel architectures. They can also be used to connect two independent trays or modules within centralized cross-connects. Base-24 patch cables are typically used for 100G data rates over SR10 transceivers and can be identified by a red boot at the rear of the connector.

MTP Patch Cables

Technical data

Attribute	Value
Cable diameter	3.0 mm, 8 fibers 3.0 mm, 12 fibers 3.0 mm, 24 fibers
Design acc. to IEC 61754-7 and TIA 604-5 Type MPO	compliant
Tensile load	50N
Operating temperature	-10 to +60 °C
Material	flame retardant acc. to UL 94 V-0
RoHS guidelines 2011/65/EU	compliant

Optical values

Туре	Measurement method (IL/RL)	IL (dB)	RL (dB)
SM MT elite (8, 12 and 24 fiber)	IL tested per IEC 6111.8-3-4 method B	0.10/0.35	> 60
	RL tested per IEC 6111.8-3-6 method B		
MM MT elite (8, 12 and 24 fiber)	IL tested per IEC 6111.8-3-4 method B	0.10/0.35	> 30
	RL tested per IEC 6111.8-3-6 method B		

LC-XD Patch Cables



Characteristics

- Patented push-pull mechanism for best handling and highest density
- Stable lever with easy-grip design and marking possibility
- Short connector body length
- Two connections in one LC-shaped adapter
- Polarity flipping without tool
- Compatible to standard (6.25 mm) and mini LC (5.25 mm) adapters and transceivers
- Available in plenum, riser, and general purpose rating

Base-2 LC patch cables connect fiber optic patch panels to servers and switches in duplex serial architectures. They can also be used to connect two independent trays or modules within centralized cross-connects.

Depending on the application, HUBER+SUHNER has a range of LC patch cables to match your particular need. The LC-XD patch cable incorporates the world's first push-pull LC connector and facilitates simple insertion as well as removal simply by pushing or pulling the extraction finger at the rear of the connector. This innovative step means that even in the highest density environments, users can still carry out moves, adds and changes with minimal disruption.

Technical data

Specification	Value
Cable diameter	2.1 mm
Design acc. to IEC 61754-20 and TIA 604-10-B	compliant
Thermal and mechanical tests acc. to IEC 61753-1	fulfilled
Side load acc. to GR-326-CORE	fulfilled
Tensile load	70 N
Operating temperature	-25 to +70 °C
Material	Compliant with plenum, riser and general purpose requirements
RoHS guidelines 2011/65/EU	compliant

Optical performance

Туре	Measurement method (IL/RL)	IL (dB)	RL (dB)
SMUPC	IL: IEC 6111.8-3-4 method B	≤0.30	≥ 50
SM APC	RL: IEC 6111.8-3-6	≤0.30	≥65
MM OM3	IL: IEC 6111.8-3-34 method B	≤ 0.25	≥ 35
MM OM4	RL: IEC 6111.8-3-6	≤ 0.15	≥ 35

LC-XD Patch Cables

Ordering information

LC-XD uniboot duplex jumper cable, push-pull, polarity A-B/B-A and A-A/B-B, cable diameter 2.1 mm

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Fiber Type Polarity	Description	Length (m)	Item Number
SM A-B/B-A	LC XD - LC XD duplex patch cable, ONFP OS2 1.5m A-B/B-A	1.5	85090208
	LC XD - LC XD duplex patch cable, ONFP OS2 3.5m A-B/B-A	3.5	85090209
	LC XD - LC XD duplex patch cable, ONFP OS2 5m A-B/B-A	5	85080879
	LC XD - LC XD duplex patch cable, ONFP OS2 7m A-B/B-A	7	85090210
	LC XD - LC XD duplex patch cable, ONFP OS2 10m A-B/B-A	10	85088924
SM A-A/B-B	LC XD - LC XD duplex patch cable, ONFP OS2 1.5m A-A/B-B	1.5	85090211
	LC XD - LC XD duplex patch cable, ONFP OS2 3.5m A-A/B-B	3.5	85090212
	LC XD - LC XD duplex patch cable, ONFP OS2 5m A-A/B-B	5	85090213
	LC XD - LC XD duplex patch cable, ONFP OS2 7m A-A/B-B	7	85090214
	LC XD - LC XD duplex patch cable, ONFP OS2 10m A-A/B-B	10	85090215
OM3 A-B/B-A	LC XD - LC XD duplex patch cable, ONFP OM3 1.5m A-B/B-A	1.5	85090216
	LC XD - LC XD duplex patch cable, ONFP OM3 3.5m A-B/B-A	3.5	85090217
	LC XD - LC XD duplex patch cable, ONFP OM3 5m A-B/B-A	5	85090218
	LC XD - LC XD duplex patch cable, ONFP OM3 7m A-B/B-A	7	85090219
	LC XD - LC XD duplex patch cable, ONFP OM3 10m A-B/B-A	10	85090009
OM3 A-A/B-B	LC XD - LC XD duplex patch cable, ONFP OM3 1.5m A-A/B-B	1.5	85090220
	LC XD - LC XD duplex patch cable, ONFP OM3 3.5m A-A/B-B	3.5	85090221
	LC XD - LC XD duplex patch cable, ONFP OM3 5m A-A/B-B	5	85090222
	LC XD - LC XD duplex patch cable, ONFP OM3 7m A-A/B-B	7	85090223
	LC XD - LC XD duplex patch cable, ONFP OM3 10m A-A/B-B	10	85090224
OM4 A-B/B-A	LC XD - LC XD duplex patch cable, ONFP OM4 1.5m A-B/B-A	1.5	85090225
	LC XD - LC XD duplex patch cable, ONFP OM4 3.5m A-B/B-A	3.5	85090226
	LC XD - LC XD duplex patch cable, ONFP OM4 5m A-B/B-A	5	85090227
	LC XD - LC XD duplex patch cable, ONFP OM4 7m A-B/B-A	7	85090228
	LC XD - LC XD duplex patch cable, ONFP OM4 10m A-B/B-A	10	85090229
OM4 A-A/B-B	LC XD - LC XD duplex patch cable, ONFP OM4 1.5m A-A/B-B	1.5	85090230
	LC XD - LC XD duplex patch cable, ONFP OM4 3.5m A-A/B-B	3.5	85090231
	LC XD - LC XD duplex patch cable, ONFP OM4 5m A-A/B-B	5	85090232
	LC XD - LC XD duplex patch cable, ONFP OM4 7m A-A/B-B	7	85090233
	LC XD - LC XD duplex patch cable, ONFP OM4 10m A-A/B-B	10	85090234

HUBER+SUHNER Cable Assembly - Order Code

1 2 3 4 5 6 7 8

1 Asse	embly type	
PTxx	Pigtail (BTW)	xx: fiber count (e.g. 01)
PSxx	Pigtail set	Dx: for duplex zip cord
PCxx	Patch cord	Rx: for ruggedized/round duplex/duplex
MRxx	Multifiber riser	xS: straight polarity A-B/B-A
Moxx	Multifiber breakout	xF: flipped polarity A-A/B-B
Мухх	MTP based assembly	y: polarity
		A: crossed
		B: straight
		C: pairwise crossed
		D: level flip (MT24)
		E: straight (MT24)

5	Leng	gth (refer to section 8 for unit)
X>	<.x	Length (ferrule tip to ferrule tip $/ 03.5 = 3.5$)
XX	xx	Length if > 99 (ferrule tip to ferrule tip / 1000 = 1000)
6	Asse	embly class, left side
7	Asse	embly class, right side
S		SM standard
В		SM grade B/SM elite for MTP
А		SM 0.1dB
Н		SM 0.1dB High-Power
Μ		MM standard
L		MM low loss/MM elite for MTP
0		w/o connector on the right side
Q	Unit	of the longth
0	Unit	or me rengin
Х		Choose this when length in section 5 is in meter.

Leave it empty when length in section 5 is in ft.

LCxy	LC	x: U: UPC/SM	
SCxy	SC	A: APC 80/SM M: PC MM	
FCxy	FCPC	y: S: simplex	
LHxy	FLSH	D: duplex E: simplex push-pull*	
LXxy	LX.5	P: duplex push-pull*	
STxy	ST	G: simplex high density*	
MTxy	MTP		
0000	w/o connector on the right side	X: XD (extreme density)" F: female (MTP) M: male (MTP)	
		*only applicable for LC	
4 Cable type			

4 C	able type	
Smxxy	SM-standard, G652.D	xx: cable diameter (1/10mm)
Alxxy	SM-LowBend r10, G657.A1	y: T: tight tube F: easy strip tube
A2xxy	SM-LowBend r7.5, G657.A2	R: UL conform
ОЗхху	MM, G50, OM3	
O4xxy	MM, G50, OM4	

Examples PTO1_LCU

PT01_LCUS_0000_SM09E_02.0_SOX

Connector, left side

3 Connector, right side

2

Pigtail one fiber, LC UPC simplex connector on the left, without connector on the right, SM G.652.D, 0.9 mm fiber, 2 m length, SM standard performance

PCDS_ICMD_ICMD_0420E_05.5_LLX

Patch cord duplex zip cord (fig. 8), LC MM standard duplex left and right, OM4 duplex zip cord 2.0 mm, 5.5 m length, MM low loss performance





Fiber Pathways

The HUBER+SUHNER fiber pathways solution can be installed underfloor or overhead and provides a secure and stress-free routing channel for fiber cabling within a structured cabling solution. Curved fittings such as cross-pieces, tees and elbows are specifically designed to protect fibers so that a minimum bend radius of 1.2 in is maintained at all times.

Unlike conventional cable baskets and ladders, the HUBER+SUHNER fiber pathways solution offers lateral support along the complete fiber length. This reduces the risk of both macro and micro-bending of the individual cables.

In order to reduce installation times and simplify the complete assembly process, HUBER+SUHNER supplies all pathways components pre-assembled with end cap. This unique feature can reduce installation times by as much

as 50 % and reduces the complexity involved in connecting straight pathways of different lengths to other components. Because a straight pathway always requires at least one joiner, we assemble this in the factory so that full-length pathways can be connected in the fastest possible time. We also pre-fit the screws on the unmated side of the joiner to further improve handling and reduce installation times.

Key Features Pathways

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CAD and visio stencils for easy planning

The pathway system from HUBER+SUHNER is supported with a comprehensive stencil package which allows planners to design accurate pathway drawings of their complete network infrastructure. Drag and drop functionality provides a fast and logical user experience.

Cable slack management

With the rising use of pre-terminated cable systems, network service operators are looking for new ways to manage excess cable slack between equipment cabinets and optical cross-connects. The pathway system can be configured with strategically placed storage loops that take up excess cable length. Storage loops can be in-line or off-line depending on the quantity, size and length of cables being managed.

Pre-installed joiners cut installation time by 50 %

All pathway components are delivered on site with pre-installed end cap at one end. This allows the user to cut the open end to length and then quickly fix the two components together. On larger projects, this feature contributes greatly to reduced installation times and rapid deployments.

Protected cable routing to equipment cabinets

Retrofittable top outlets can be added to straight sections of pathway so that cables can be protected between the main routes and the cabinet. Full radius protection is provided from the pathway to the cabinet and open sides facilitate fast and simple moves, adds and changes (MACs).









Ordering information main pathways

Description	
Main pathway (incl. 1 joiner and screws) 4 × 4 × 79 in	85029745
Main pathway (incl. 1 joiner and screws) 6 × 4 × 79 in	85029747
Main pathway (incl. 1 joiner and screws) 9 × 4 × 79 in	85029748
Main pathway (incl. 1 joiner and screws) 12 × 4 × 79 in	85029749



Ordering information covers

Description	
Pathway cover (incl. clips) 4 × 79 in	85029751
Pathway cover (incl. clips) 6 × 79 in	85029752
Pathway cover (incl. clips) 9 × 79 in	85029753
Pathway cover (incl. clips) 12 × 79 in	85029754



Ordering information joiners

Description	ltem no.
Joiner (incl. screws) 4 × 4 in	84107835
Joiner (incl. screws) 6 × 4 in	84107834
Joiner (incl. screws) 9 × 4 in	84107833
Joiner (incl. screws) 12 × 4 in	84107832



Ordering information end cap

Description	ltem no.
End cap 4 × 4 in	84107847
End cap 6 × 4 in	84107846
End cap 9 × 4 in	84107845
End cap 12 × 4 in	84107844



Ordering information horizontal crosses

Description	ltem no.
Horizontal cross (incl. 2 end cap and screws) 4 × 4 in	85029759
Horizontal cross (incl. 2 end cap and screws) 6 × 4 in	85029760
Horizontal cross (incl. 2 end cap and screws) 9 × 4 in	85029761
Horizontal cross (incl. 2 end cap and screws) 12 × 4 in	85029762



Ordering information horizontal cross covers

Description	ltem no.
Horizontal cross cover 4 in	84108097
Horizontal cross cover 6 in	84108096
Horizontal cross cover 9 in	84108095
Horizontal cross cover 12 in	84108094



Ordering information horizontal tees

Description	ltem no.
Horizontal tee (incl. 2 end cap and screws) 4 x 4 in	85029764
Horizontal tee (incl. 2 end cap and screws) 6 x 4 in	85029765
Horizontal tee (incl. 2 end cap and screws) 9 x 4 in	85029766
Horizontal tee (incl. 2 end cap and screws) 12 x 4 in	85029767



Ordering information horizontal tee covers

Description	Item no.
Horizontal tee cover 4 in	84117259
Horizontal tee cover 6 in	84117258
Horizontal tee cover 9 in	84117257
Horizontal tee cover 12 in	84117256



Ordering information horizontal elbows 90°

Description	ltem no.
Horizontal elbow 90° (incl. 1 joiner and screws) 4 × 4 in	85029769
Horizontal elbow 90° (incl. 1 joiner and screws) 6 × 4 in	85029770
Horizontal elbow 90° (incl. 1 joiner and screws) 9 × 4 in	85029771
Horizontal elbow 90° (incl. 1 joiner and screws) 12 × 4 in	85029772



Ordering information horizontal elbow covers 90°

Description	ltem no.
Horizontal elbow cover 90° 4 in	84117268
Horizontal elbow cover 90° 6 in	84117265
Horizontal elbow cover 90° 9 in	84117263
Horizontal elbow cover 90° 12 in	84117261



Ordering information vertical down elbows 90°

Description	ltem no.
Vertical down elbow 90° (incl. 1 joiner and screws) 4 × 4 in	85029789
Vertical down elbow 90° (incl. 1 joiner and screws) 6 × 4 in	85029790
Vertical down elbow 90° (incl. 1 joiner and screws) 9 × 4 in	85029791
Vertical down elbow 90° (incl. 1 joiner and screws) 12 × 4 in	85029792



Ordering information vertical down elbow covers 90°

Description	ltem no.
Vertical down elbow cover 90° 4 in	84117298
Vertical down elbow cover 90° 6 in	84117297
Vertical down elbow cover 90° 9 in	84117296
Vertical down elbow cover 90° 12 in	84117295



Ordering information vertical up elbows 90°

Description	ltem no.
Vertical up elbow 90° (incl. 1 joiner and screws) 4 × 4 in	85029794
Vertical up elbow 90° (incl. 1 joiner and screws) 6 × 4 in	85029795
Vertical up elbow 90° (incl. 1 joiner and screws) 9 × 4 in	85029796
Vertical up elbow 90° (incl. 1 joiner and screws) 12 × 4 in	85029797



Ordering information vertical up elbow covers 90°

Description	ltem no.
Vertical up elbow cover 90° 4 in	84117308
Vertical up elbow cover 90° 6 in	84117307
Vertical up elbow cover 90° 9 in	84117306
Vertical up elbow cover 90° 12 in	84117305



Ordering information trumpet outlets

Description	ltem no.
Trumpet outlet (incl. 1 joiner and screws) 4 × 4 in	85029784
Trumpet outlet (incl. 1 joiner and screws) 6 × 4 in	85029785
Trumpet outlet (incl. 1 joiner and screws) 9 × 4 in	85029786
Trumpet outlet (incl. 1 joiner and screws) 12 × 4 in	85029787



Ordering information reducers

Description	ltem no.
Reducer (incl. 1 joiner and screws) 6 to 4 × 4 in	85029801
Reducer (incl. 1 joiner and screws) 9 to 6 × 4 in	85029802
Reducer (incl. 1 joiner and screws) 12 to 9 × 4 in	85029803
Reducer (incl. 1 joiner and screws) 12 to 4 × 4 in	85073020



Ordering information reducer covers

Description	ltem no.
Reducer cover 6 to 4 in	84117319
Reducer cover 9 to 6 in	84117320
Reducer cover 12 to 9 in	84117322
Reducer cover 12 to 4 in	85073029



Ordering information top outlet drop-offs

Description	ltem no.
Top outlet drop-off horizontal (incl. 1 joiner and screws) 4 × 4 in	85029798
Top outlet drop-off vertical (incl. 1 joiner and screws) 4 × 4 in	85029799


Ordering information top outlet drop-off covers

Description	ltem no.
Top outlet drop-off cover horizontal 4 in	84117315
Top outlet drop-off cover vertical 4 in	84117316



Ordering information top outlet mounting brackets

Description	ltem no.
Top outlet mounting bracket, horizontal	84107849
Top outlet mounting bracket, vertical	85005492



Ordering information pathway fixing bolt

Description	ltem no.
Pathway fixing bolt	84107837

Copper and LAN Solutions





Copper and LAN Solutions

HUBER+SUHNER designs and manufactures cost-effective high-performance copper products to support applications including 10GBase-T and remote powering (PoE+). Our tailored solutions offer proven and reliable performance characteristics which exceed all of the relevant cabling standards found on the international market.

Our copper products allow you to utilize the full capacity and transmission distance of your copper infrastructure without compromising flexibility and handling. Built from high quality, proven components, the Category 5e, Category 6 and Category 6A solutions operate to 250 and 500 MHz respectively, with overcapacity built into selected components for enhanced longevity and upgradability.

Each component is compliant to the relevant component standards, and when installed in combination, provide link and channel performance which exceeds the ISO/IEC, EN and TIA link and channel standards.

Data Communication Jacks

Category 5e Premium Jacks

Ordering information

Description	Item Number	Pictures
Category 5e premium jack, unshielded, punch down, keystone, blue	85087747	
Category 5e premium jack, unshielded, punch down, keystone, green	85087748	
Category 5e premium jack, unshielded, punch down, keystone, office white	85087749	20200
Category 5e premium jack, unshielded, punch down, keystone, yellow	85087750	
Category 5e premium jack, unshielded, punch down, keystone, gray	85088277	
Category 5e premium jack, unshielded, punch down, keystone, red	85087751	
Category 5e premium jack, unshielded, punch down, keystone, black	85087752	
Category 5e premium jack, unshielded, punch down, keystone, orange	85092233	
Category 5e premium jack, unshielded, punch down, keystone, ivory	85092234	

Category 6 Premium Jacks

Ordering information

Description	Item Number	Pictures
Category 6 premium jack, unshielded, punch down, keystone, blue	85087753	
Category 6 premium jack, unshielded, punch down, keystone, green	85087754	
Category 6 premium jack, unshielded, punch down, keystone, office white	85087755	
Category 6 premium jack, unshielded, punch down, keystone, yellow	85087756	
Category 6 premium jack, unshielded, punch down, keystone, gray	85088279	
Category 6 premium jack, unshielded, punch down, keystone, red	85087757	
Category 6 premium jack, unshielded, punch down, keystone, black	85087758	
Category 6 premium jack, unshielded, punch down, keystone, orange	85092235	
Category 6 premium jack, unshielded, punch down, keystone, ivory	85092236	

Category 6 Premium Toolless Jacks

Ordering information

Description	Item Number	Pictures
Category 6 premium jack, unshielded, toolless, keystone, black	85067214	
Category 6 premium jack, unshielded, toolless, keystone, office white	85066494	
Category 6 premium jack, unshielded, toolless, keystone, red	85087838	
Category 6 premium jack, unshielded, toolless, keystone, gray	85087839	
Category 6 premium jack, unshielded, toolless, keystone, yellow	85080906	
Category 6 premium jack, unshielded, toolless, keystone, blue	85087840	
Category 6 premium jack, unshielded, toolless, keystone, green	85087841	
Category 6 premium jack, unshielded, toolless, keystone, orange	85087842	
Category 6 premium jack, unshielded, toolless, keystone, ivory	85087843	

Premium jack – tested to component level TIA specifications Base jack – tested to permanent link TIA specifications

Data Communication Jacks

Category 6A Base Jacks

Ordering information

Description	Item Number	Pictures
Category 6A base jack, unshielded, punch down, keystone, black	85087858	
Category 6A base jack, unshielded, punch down, keystone, office white	85087860	
Category 6A base jack, unshielded, punch down, keystone, red	85087862	
Category 6A base jack, unshielded, punch down, keystone, gray	85087863	
Category 6A base jack, unshielded, punch down, keystone, yellow	85087864	N 🦄 🚅
Category 6A base jack, unshielded, punch down, keystone, blue	85087865	
Category 6A base jack, unshielded, punch down, keystone, green	85087866	
Category 6A base jack, unshielded, punch down, keystone, orange	85087867	
Category 6A base jack, unshielded, punch down, keystone, ivory	85087868	
Category 6A UTP angled jack, office white	85090170	P

Category 6A Premium Jacks

Ordering information

Description	Item Number	Pictures
Category 6A premium jack, unshielded, punch down, keystone, black	85087845	
Category 6A premium jack, unshielded, punch down, keystone, office white	85087847	
Category 6A premium jack, unshielded, punch down, keystone, red	85087849	-
Category 6A premium jack, unshielded, punch down, keystone, gray	85087850	
Category 6A premium jack, unshielded, punch down, keystone, yellow	85087851	
Category 6A premium jack, unshielded, punch down, keystone, blue	85087852	
Category 6A premium jack, unshielded, punch down, keystone, green	85087853	
Category 6A premium jack, unshielded, punch down, keystone, orange	85087854	
Category 6A premium jack, unshielded, punch down, keystone, ivory	85087855	

Premium jack – tested to component level TIA specifications Base jack – tested to permanent link TIA specifications

Keystone In-line Coupler

Description	Item Number	Pictures
Category 6, unshielded, keystone in-line coupler, office white, compatible with HUBER+SUHNER snap-in face plates and patch panels	84381114	Î
Category 6A, unshielded, keystone in-line coupler, office white, compatible with HUBER+SUHNER snap-in face plates and patch panels	84381116	

Audio/Video Jacks

HUBER+SUHNER offers a wide range of audio and video connectivity to meet the interactive display needs of your environment. Please contact your local HUBER+SUHNER representative with any questions regarding our A/V connectivity.

Ordering information		
Description	Item Number	Pictures
RCA keystone connector module, IDC termination, for video/audio use, black	85088365	
RCA keystone connector module, IDC termination, for video/audio use, red	85089772	
RCA keystone connector module, IDC termination, for video/audio use, yellow	85089773	
RCA keystone connector module, IDC termination, for video/audio use, office white	85089774	
RCA connector, for RCA A/V line, 16.30mm in width, compatible with 24 port patch panel, white	85089463	
RCA connector, for RCA A/V line, 16.30mm in width, compatible with 24 port patch panel, yellow	85089464	
RCA connector, for RCA A/V line, 16.30mm in width, compatible with 24 port patch panel, black	85089465	

Audio/Video Jacks

RCA connector, for RCA A/V line, 16.30mm in width, compatible with 24 port patch panel, blue	85089466	
RCA connector, for RCA A/V line, 16.30mm in width, compatible with 24 port patch panel, green	85089467	
F-/F snap-in connector	85089468	800
S-Video keystone connector module, IDC termination	85089469	
ST fiber keystone connector module	85088364	and the
MT-RJ SM/MM fiber keystone connector module	85088363	
LC duplex SM fiber keystone connector module	85088361	00

Audio/Video Jacks

LC duplex MM fiber keystone connector module	85088360	
SC MM fiber keystone connector phosphor bronze module, black	85088362	
USB 2.0 coupler, female A to female A coupler module	85089461	
USB 2.0 coupler, female A to female B coupler module	85088348	
USB 2.0 coupler, female B to female B coupler module	85089462	
USB 3.0 coupler, female A to female A coupler module	85088349	
HDMI coupler, for transmitting audio and video signals	85088347	
Blank keystone, office white	85088366	

Face Plates

Description	Item Number	Pictures
1-port, keystone mounting face plate, office white (4.87" x 3.11")	85087760	
2-port, keystone mounting face plate, office white (4.87" x 3.11")	85087761	
4-port, keystone mounting face plate, office white (4.87" x 3.11")	85087762	
6-port, keystone mounting face plate, office white (4.87" x 3.11")	85087763	==
6-port, keystone mounting face plate, office white (4.53" x 4.56")	85087764	
12-port, keystone mounting face plate, office white (4.53" x 4.56")	85087765	
Blank face plate, office white (4.53" x 2.75")	85087652	
1-port, keystone mounting face plate, office white (4.53" x 2.75")	85087653	
2-port, keystone mounting face plate, office white (4.53" x 2.75")	85087654	•

Face Plates

4-port, keystone mounting face plate, office white (4.53" x 2.75")	85087655	
1-port, edges, keystone mounting face plate, office white (4.53" x 2.75")	85087656	
2-port, edges, keystone mounting face plate, office white (4.53" x 2.75")	85087657	
4-port, edges, keystone mounting face plate, office white (4.53" x 2.75")	85087658	
1-port, keystone mounting face plate, stainless steel brused (4.53" x 2.75")	85087660	•
2-port, keystone mounting face plate, stainless steel brused (4.53" x 2.75")	85087661	0
2-port horizontal, keystone mounting face plate, stainless steel brused (4.53" x 2.75")	85087666	
4-port, keystone mounting face plate, stainless steel brused (4.53" x 2.75")	85087663	
1-port, window label, keystone mounting face plate, stainless steel brused (4.53" x 2.75")	85087668	

Face Plates

2-port, window label, keystone mounting face plate, stainless steel brused (4.53" x 2.75")	85087669	
2-port horizontal, window label, keystone mounting face plate, stainless steel brused (4.53"x2.75")	85087670	
4-port, window label, keystone mounting face plate, stainless steel brused (4.53" x 2.75")	85087671	
1-port, window label, keystone mounting face plate, office white (4.53" x 2.75")	85087672	
2-port, window label, keystone mounting face plate, office white (4.53" x 2.75")	85087673	
4-port, window label, keystone mounting face plate, office white (4.53" x 2.75")	85087674	
Window label, face plate frame module, office white (4.53"x2.75"x0.36")	85087716	
Window label, face plate frame module, office white (4.53"x2.75"x0.59")	85087717	

Surface Mount Boxes

Description	Item Number	Pictures
1-port surface mount box, office white	85087766	
2-port surface mount box, office white	85087768	
4-port surface mount box, office white	85087769	
6-port surface mount box, office white	85087770	
1-gauge surface mounting box for mounting modules, with snap-in fitting on wall or table, office white	85087739	
3-gauge surface mounting box for mounting modules, with snap-in fitting on wall or table, office white	85087742	
Blank, 1-row bezel, office white	85087718	
Bezel 1 row, 1 port key stone, white	85087719	
Bezel 1 row, 2 port key stone, white	85087720	
Bezel 1 row, 1 Category 6 port, white	85087721	
Bezel 1 row, 2 Category 6 port, white	85087722	

Fiber Bezels

Ordering information

Description	Item Number	Pictures
Bezel 1 row, 2 LC ports, white	85087723	No.
Bezel 1 row, 4 LC ports, white	85087724	8.8
Bezel 1 row, 1 SC ports, white	85087771	
Bezel 1 row, 2 SC ports, white	85087772	

Universal Patch Panels

Description	Item Number	Pictures
1U, 24-port, snap-in patch panel, black	85066808	
1U, 24-port, snap-in patch panel, staggered, black	85088271	
1U, 24-port, angled snap-in patch panel, black	85088264	
1U, 48-port, snap-in patch panel, shielded, silver	85066054	-
1U, 48-port snap-in patch panel, black	84381106	
2U, 48-port, snap-in patch panel, black	85092068	
1U, blank panel, black	85088609	

Patch Panels

Category 5e Patch Panels

Ordering information

Description	Item Number	Pictures
1U, 24-port, Category 5e, punch down patch panel, black	85091493	vv
2U, 48-port, Category 5e, punch down patch panel, black	85091494	
1U, 24-port, Category 5e, angled punch down premium patch panel, black	85088275	
2U, 48-port, Category 5e, angled punch down premium patch panel, black	85088276	

Category 6 Patch Panels

Description	Item Number	Pictures
1U, 24-port, Category 6, punch down panel, with earthing kit and cable management bar, black stainless steel	85066660	Survey and Survey
1U, 24-port, Category 6, punch down, PCB type patch panel, black	85088267	on
1U, 24-port, Category 6, angled, punch down, PCB type patch panel, black	85088265	******
2U, 48-port, Category 6, punch down, PCB type patch panel, black	85088268	
2U, 48-port, Category 6, angled, punch down, PCB type patch panel, black	85088266	
1U, 24-port, Category 6, angled, punch down, PCB type premium patch panel, black	85088269	***********
2U, 48-port, Category 6, angled, punch down, PCB type premium patch panel, black	85088270	

Patch Panels

Category 6A Patch Panels

Ordering information

Description	Item Number	Pictures
1U, 24-port, Category 6A, punch down, PCB type patch panel, black	85088272	
2U, 48-port, Category 6A, punch down, PCB type patch panel, black	85088273	

Pre-terminated Copper Solutions

Description	Item Number	Pictures
Category 6 UTP cassette with 6 ports	85087835	
1U, front metal panel, 24-port using 4 copper cassettes	85066059	
1U, front metal panel, 48-port using 8 copper cassettes	85066060	

RJ45 Patch Cords



Characteristics

- Independently tested and verified
- Component-rated for optimum channel performance
- 24, 26, 28-AWG stranded cable for maximum flexibility
- Standard plugs feature over-moulded boot to protect plug
- High density polyethylene insulation, polyvinylchloride jacket

Ordering information

Item Number	Description
85087923	Category 5e patch cord, 26 AWG F/UTP, 10ft, gray*
85087925	Category 5e patch cord, 24 AWG UTP, 10ft, gray*
85087920	Category 6 patch cord, 28 AWG UTP, 10ft, gray*
85087922	Category 6 patch cord, 24 AWG UTP, 10ft, gray*
85087918	Category 6A patch cord, 28 AWG F/UTP patch cord, 10ft, gray*
85087919	Category 6A patch cord, 26 AWG F/UTP patch cord, 10ft, gray*

* Standard lengths includes: 1, 3, 5, 7, 10, 15ft

* Available colors: red, yellow, green, blue, gray, white, black

Contact Customer Services for additional product configurations

Horizontal Cable Guides



Characteristics

- 19 in basic management panel
- Robust steel construction
- Easy patch cord organisation
- Assembled with 5 support guiders

Ordering information

Description	ltem no.
Cable guide, 1U, 5 guiders, black	85005733
Cable guide, 2U, 5 guiders, black	85005734

Horizontal Cable Channel Guides



Characteristics

• 19 in basic management panel

- Robust steel baseplate, plastic tunnel and cover
 - Easy patch cord organisation

Description	ltem no.
Cable channel guide, 1U, slotted tunnel with cover, black	85005737
Cable channel guide, 2U, slotted tunnel with cover, black	85005738

Advanced Technologies



ISA



Advanced Technologies

Communication technologies are ever evolving. To help customers understand these advancing technologies, HUBER+SUHNER has made significant investments in several of these new technologies – notably, WDM systems from Cube Optics and all optical switching from Polatis.

HUBER+SUHNER Cube Optics develops and produces wavelength-division multiplexing (WDM) solutions based on state of the art fiber optic technology. WDM systems provide a cost effective solution for boosting the data transmission rates across not only local networks but also long distances as well as multiple/branch locations.

HUBER+SUHNER Polatis is the most technologically advanced all optical switching platform on the market today. With an all optical switch (OOO), data transmissions are not converted from optical to electric to optical signals - introducing latency and insertion losses into transmissions - but kept as all optical signals, thus switching data streams much faster and more reliably with lower insertion loss. The Polatis solutions allow the efficient management of ever-increasing data volumes and are a key building block in the evolution towards software defined networks (SDN).

Key Features Optical Transport Systems

Smallest footprint on the market

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Integrated into 19" racks or in the form of a IANOS module, HUBER+SUHNER is specializes in providing highest density multiplexers for different WDM grids in the smallest possible housings. These can be equipped with different connectors, where MTP offers the highest possible density connectivity per available rack space.

Fully compliant to industry standards

All solutions comply with relevant industry standards and are designed for easy integration into existing standardized systems. Data transport solutions provided by HUBER+SUHNER are furthermore fully interoperable with all major active system providers in order to make future transition to higher speeds as simple as possible.

Delivering what matters

While the major part of the data center market is still using 10G interconnections between data centers, HUBER+SUHNER already has a proven track record with major players in the market in installing 100G passive data transport connections in system critical links. Solutions cover not only single channel 100G, but also multichannel transmissions of 100G with co-propagating 10G to offer migration from 10G to 100G in easy and affordable steps.

Integration of active elements

For demanding networks that require better reach, performance or resilience, HUBER+SUHNER has wide offerings of amplifiers, media converters, demarcation units and optical protection switches.











HUBER+SUHNER Network Cube

HUBER+SUHNER offers all types of optical muxes, ranging from simple Wideband WDM over coarse WDM to dense WDM. We are able to combine the different WDM grids and/or cascade several muxes in order to create optimal solutions suitable to each customer's needs.

We are very much aware that you have a specific unique network architecture. In order to meet your individual network requirements, we have solutions that are designed for point to point or ring deployments (OADMs). With these solutions, we can mix and match specific lambdas of different grids or use band splitters, in order to allocate more than one wavelength to certain locations.

You will find products and solutions in the following pages covering most of your needs, however, we encourage you to contact your local HUBER+SUHNER representative for a customized analysis of your needs.

WDM Network Cube



Characteristics

- Smallest footprint on the market
- Highly flexible and scalable
- 1310/1550 wideband Mux and Demux for SDH/SONET/ATM
- Mux and Demux, up to 48 channels, cascadable
- Mux and Demux, 4 or 8 channels + Pass of SDH/ATM channel
- OADM modules, 1, 2 or 4 channels
- Integration of taps, band splitters and WWDMs on demand
- Wide range of adapters: SC, LC, E2000, MU
- Private labeling and customization
- Available for line card and sub-rack mounting

The WDM network cube features a broad range of Wideband (SDH/SONET), coarse wavelength division multiplexing and dense wavelength division multiplexing configurations. HUBER+SUHNER offers enough scalability and flexibility to implement a wide range of network node functions such as Mux, Demux or OADMs. All network topologies can be accommodated by the cube including point to point, mesh or ring architectures.

A maximum of two WDM network cubes can be integrated inside a single 1U WDM-MODULAR-SHELL and if increased density is required, a sub-rack with up to eight modules is available. Further density is added, when we integrate WDM into IANOS modules.

WDM network cubes are fully compliant with the ITU G.694.2, NEBS level 3 and Telcordia GR1221 standard, guarantying interosperability and easy integration with all other compliant equipment.

Description	Incortion	cc (dB) 1)		Product family
Description	Insemonito	55 (UD) ·		riodocrianny
CWDM modules (tor 1 slot of the WDM modular shell)				
 CWDM 8 channel mux and demux for bi-directional data transmission over two fibers. CWDM channels: 1470, 1490, 1510, 1530, 1550,1570, 1590, 1610 nm 	Мах.: Тур.:	CWDM < 2.8 2.2		CWDM-MUX-8 C-1640_Rev.A
 CWDM 8 channel mux and demux with 1310 band ports for bi-direction- al data transmission over two fibers. CWDM channels: 1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610 nm 1310/WWDM band: 1260 to 1360 nm for "gray " 1310 nm transceivers 	Мах.: Тур.:	CWDM < 3.6 1.7	WWDM < 1.2 0.7	CWDM-MUX-8+1310 C-1651_Rev.B
 CWDM 8 channel mux and demux with UG band ports for bi-directional data transmission over two fibers. CWDM channels: 1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610 nm UG/upgrade band: 1260 to 1438 nm, for later upgrades or "gray " 1310 nm transceivers 	Мах.: Тур.:	CWDM < 3.6 2.5	UG < 1.2 1.2	CWDM-MUX-8+UG C-1678_Rev.C

WDM Network Cube

Description	Insertion loss (dB) ¹⁾			Product family
DWDM modules (fixed 1HU/19" rack-mountable), all these units are also available as 200 GHz units				
 DWDM 16 channel (100 GHz grid) mux and demux for bi-direction- al data transmission over two fibers. DWDM channels: to be selected by customer out of the 100 GHz ITU grid 	Мах.: Тур.:	DWDM < 4.0 2.4		DWDM-MUX-8FS C-2513_Rev.B
 DWDM 8 channel (100 GHz grid) mux and demux for bi-directional data transmission over two fibers. DWDM channels: to be selected by customer out of the 100 GHz ITU grid 	Мах.: Тур.:	DWDM < 4.1 2.9	UG < 0.7 0.8	DWDM-MUX-8+UG C-2468_Rev.A
 DWDM 16 channel (100GHz grid) mux and demux for bi-direction- al data transmission over two fibers. DWDM channels: to be selected by customer out of the 100 GHz ITU grid 	Мах.: Тур.:	DWDM < 4.1 2.7	WWDM < 1.2 0.9	DWDM-MUX-8+1310 C-2401_Rev.A
 DWDM 16 channel (100 GHz grid) mux and demux for bi-direction- al data transmission over two fibers. DWDM channels: to be selected by customer out of the 100 GHz ITU grid 	Мах.: Тур.:	DWDM < 4.0 2.5		DWDM-MUX-16 C-2402_Rev.A
 DWDM 16 channel (100 GHz grid) mux and demux with UG band ports for bi-directional data transmission over two fibers. DWDM channels: ITU 100 GHz grid channel 21 to 36 UG/upgrade band: supporting channel 43 to 59 	Мах.: Тур.:	DWDM < 4.5 2.8	UG < 1.0 0.9	DWDM-MUX-16+UG C-2403_Rev.B
 DWDM 40 channel (100 GHz grid) mux and demux for bi-direction- al data transmission over two fibers, based on athermal AWG technology with wideband passbands. DWDM channels: to be selected by customer out of the 100 GHz ITU grid 	Мах.: Тур.:	DWDM < 5.0 4.4		DWDM-MUX-40 C-2477_Rev.B
 DWDM 48 channel (100 GHz grid) mux and demux for bi-direction- al data transmission over two fibers, based on athermal AWG technology with wideband passbands. DWDM channels: to be selected by customer out of the 100 GHz ITU grid 	Мах.: Тур.:	DWDM < 5.0 4.6		DWDM-MUX-48 C-2533_Rev.B



HUBER+SUHNER Transport Cube

Due to the many existing network topologies and data transmission standards, interoperability is of utmost importance. Various devices have been developed to enable connection of different networks. The transport cube series is a carrier grade, cost effective and very flexible modular platform that combines a multi-protocol transport platform for metro applications with optionally built-in test and measurement equipment (OAM and performance monitoring). The transport cube enables network operators to implement a wide range of signal boosting, media conversions and information security with a comprehensive set of quality of service (QoS) features.

Transport Cube – Multi-Rate Transponder Platform





Characteristics

- Multi-protocol transponders from 10 Gbps for Ethernet, DSH, fiber channel, OTN, digital video
- Configurable operation mode
- Performance monitoring. Statistics on quality of service according to G.826 (ES, SES, BBE, UAS)
- 3R regeneration with FEC (Reed-Solomon algorithms) for SDH, Ethernet and fiber channel
- Detection and processing of alarms (LOS, LOF, AIS, RDI, TIM)
- Multiple chassis versions (2U and 1U chassis with 4 slots and 6U chassis with 12 slots
- Compact chassis design (compliant with IEC 60297-2 and ETS 300119-2 (300 mm depth)
- Redundant and modular power supplies (AC and DC)
- Replaceable modular filter and fan unit
- System management via web terminal, EMS, NMS, SNMP v2 and MIBII

General specifications

Attribute		Value
Dimensions	Chassis 1U	width: 19 in depth: 18 in
	Chassis 2U	width: 19 in depth: 9 in
	Chassis 6U	width: 19 in depth: 10 in
Capacity Chassis 1U		4 slots for transponder cards 1 slot for management card 2 slots for power supply (AC), redundant
	Chassis 2U	4 slots for transponder cards 1 slot for management card 2 slots for power supply (DC), redundant
	Chassis 6U	12 slots for transponder cards 1 slot for management card 2 slots for power supply (DC and AC), redundant

Electrical specifications

Attribute	Value
Power supply	-48 VDC 110/240 VAC
Power consumption	80 to 100 W (chassis 2U/1U) 180 to 450 W (chassis 6U)

Transport Cube – Multi-Rate Transponder Platform

Environmental conditions

Attribute	Value
Operation	-5 to 50 °C (non-condensing)
Storage	-20 to 70 °C (non-condensing)

Functional specifications

Attribute	Value
Interfaces	pluggable transceiver (line/client)
Operative wavelength	depending on transceivers
Transmission protocol	multi-rate (10 Mbps to 10 Gbps)
Functional modes	loopback protection media conversion regeneration port configuration
Optical specifications	depending on transceiver
Management	modular management unit (linecard)

Environmental data

Attribute	Value
Free of halogen	yes
2011/65/EC (RoHS)	fully compliant

Transport Cube – Multi-Rate Transponder Platform

Module overview

Module name		Description
TC04-CH1U	Chassis, 19" high density (HD)	1U, 4 slots
TC04-CH2U	Chassis, 19", ETSI	2U, 4 slots
TC12-CH6U	Chassis, 19", high density (HD)	6U, 12 slots
TC-MR25-3R TC-MR25-3R HD	Transponder linecard, multirate 2.7 Gbps, dual channel	SDH (STM-1/-4/-16), Gigabit Ethernet, Fast Ethernet, OTU-1, SDI, fiber channel (1/2GFC) 3R regeneration Protection switching: triggered by optical signal degradation Ports: 4 × SFP
TC-MR25-3RM TC-MR25-3RM HD	Transponder linecard, multirate 2.7 Gbps, performance monitoring, single channel	SDH (STM-1/-4/-16), Gigabit Ethernet, Fast Ethernet, OTU1, SDI, fiber channel (1/2GFC) Monitoring parameters: SDH (B1, J0), Ethernet (CRC), alarms (AIS, LOS, RDI) Protection switching: triggered by optical signal degradation, packet errors, 3R regeneration with FEC Ports: 3 × SFP
TC-MR100-3R TC-MR100-3R HD	Transponder linecard, multirate 11.3 Gbps, single channel	STM-64, 10 Gb Ethernet, OTU2, 10G FC Protection switching: triggered by optical signal degradation 3R regeneration Ports: 3 × XFP
TC-MR100-3RD TC-MR100-3RD HD	Transponder linecard, multirate 11.3 Gbps, dual channel	STM-64, 10 Gb Ethernet, OTU-2/OTU-2 LAN, 10G FC 3R regeneration with FEC Accepts tunable XFP Ports: 4 × XFP
TC-MR100-3RM	Transponder linecard, multirate 11.3 Gbps, performance monitoring, single channel	STM-64, 10Gb Ethernet,OTU-2, 10G FC Monitoring parameters SDH (B1, J0, etc) and alarms (OOF, RDI, AIS, LOS, etc), Ethernet (CRC) Protection switching: triggered by optical signal degradation, packet errors, 3R regeneration with FEC Ports: 3 × XFP
TC-OPS HD	Optical protection switch linecard	1+1 full optical line protection Latching switch mode (switch retains its current state at el. power loss); switching time < 10 ms; insertion loss < 2.4 dB (dual switch option) Connector type: LC/PC
TC-MNG-T TC-MNG-T HD	Management linecard	Configuration, control and monitoring of TC platform SNMP agent for each unit inserted in the rack Ports: 1 × RJ45 (Ethernet 10/100BASE-T), 1 × RS232
TC-NMG-0 HD	Management linecard	Configuration, control and monitoring of TC platform SNMP agent for each unit inserted in the rack Ports: 2 × SFP, 1 × RJ45 (Ethernet 10/100BASE-T/-X)
TC-PS48DC	Power supply DC	-48 VDC, modular, in-service replaceable
TC-PS240AC500-R	Power supply unit AC (external, 1U)	240 VAC, redundant PS modules, in-service replaceable
TC-PSAC300	Power supply module AC	240 VAC, 300 W module for TC04-CH1U, in-service replaceable
TC-PSAC600	Power supply module AC	240 VAC, 600 W module for TC12-CH6U, in-service replaceable
TC-PSDC600	Power supply module DC	48 VDC, 600 W module for TC12-CH6U and TC04-CH1U, in-service replaceable
TC04-FAN	Fan unit, modular	for TC04-CH2U, in-service replaceable
TC12-FAN	Fan unit, modular	for TC12-CH6U, in-service replaceable
TCO4-FIL	Air flow filter unit, modular	for TC04-CH2U, in-service replaceable

Transport Cube - SOA Pre-amplifier Linecard



Characteristics

- Semiconductor optical amplifier (SOA) for pre-amplifier use (in front of receiver)
- One slot linecard for TRANSPORT CUBE TCO4-CH1U and TC16-CH6U chassis installation
- Allows high density implementation (4 SOA/1U and 16 SOA/6U)
- Simple and easy WebGUI configuration and management via internet browser
- Remote firmware updates
- Alarm notification (power supply failure, SOA failure, LOS)
- Supports SNMPv2 with private MIB

Optical data

Attribute	Value
Operating wavelength	1290 to 1330 nm
Signal Gain ¹	13.5 dB
Saturated Output Power ^{2,3}	> 8 dBm
Noise figure	<7.5 dB
Gain ripple	< 0.2 dB
Polarization dependent gain	< 1.5 dB
Fiber Type	SMF-28 compatible ø 9 / 125 / 250µm
Optical Adapters	To be selected via order code

¹ Typical value for small optical input power.

² Typical value for option without monitoring. Monitoring options (E and I) induce 0.3 dB insertion loss per port.

³ At 3 dB gain compression.

Modules and accessories overview

Unit	Function	Remarks
TC-SOA2XX-Y-CC HD	SOA Linecard for one single 100G BASE LR4 line amplification	Linecard for one HD chassis slot. Detailed order code under "Ordering Information"

Logical Setup



Transport Cube – SOA Pre-amplifier Linecard

Customer-specific pre-amplifier line cards are available on request. For more details on customer-specific solutions contact your local sales representative or choose from our configurable options in the order code below.

1	l Reach (Gain)		
S		40 km	
L		50 km	
2	2 Monitoring Option		
Е		External monitoring (passive IN/OUT power tapping)	
		Integrated monitoring (integrated power levels in WebGUI)	
0	0 No monitoring option		
3	Co	onnector Type	
33		SC/APC	
BB		LC/APC	

Order Code Example	TC-SOA2S-I-11 HD for a SOA linecard with SC/UPC connectors on IN and OUT ports, reach 40 km, integrated power monitoring.
Note	When external monitoring (option code E) is chosen, the monitoring ports will be terminated on LC/UPC
	connectors , regardless of the connector choice for IN and OUT (connector code option)

Transport Cube - SOA Pre-amplifier Unit



Characteristics

- Semiconductor Amplifier (SOA) unit for 19" rack type installation (1U)
- For 40G/100G BASE applications at 1310 nm
- To be placed before the receiver of the 40G / 100G transceiver
- Extends the reach of 40G BASE / 100G BASE-LR optical transceivers
- Two hot pluggable redundant power supplies
- Remote accessible via Fast Ethernet (RJ-45 port).
- Manageable via web interface (local craft terminal)
- SOA current can be varied to adjust the optical gain
- Alarms sent via Fast Ethernet interface

General Specifications

Attribute	Value
Operating Temperature	+0°C to +50°C
Storage Temperature	-40°C to +85°C
Fiber Type	SMF-28 compatible Æ 9 / 125 / 250µm
Optical Adapters	To be selected by customer via order code
Electrical Power	Depending on oder code (100 to 240 VAC or -48 VDC)

Optical Performance

Attribute	Value
Operating Wavelength	1290 nm to 1330 nm
Signal Gain (Peak) 1	Depending on order code
Saturated Output Power	> 8 dBm (@ 3 dB gain compression)
Noise Figure	<7.5 dB
Gain Ripple	0.2 dB
Polarization Dependent Gain	< 1.5 dB

Transport Cube – SOA Pre-amplifier Unit – Order Code

Customer-specific pre-amplifier units are available on request. For more details on customer-specific solutions contact your local sales representative or choose from our configurable options in the order code below.

C - 2508 1 - 3	-	Rev. C
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1	Electrical power		
А		100 to 240 VAC	
D		-48 VDC	
2	Opt	ical gain	
1	5	15 dB	
1	7	for 100 Gbase-LR4 up to 55 km	
1	8	18.5 dB	
3	Con	nector type	
3		SC/APC	
4		FC/APC	
В		LC/APC	

Product description: SOA pre-amplifier unit Product code: C-2508

Example	C - 2 5 0 8 - D - 1 5 - 3 3 - Rev.C	
SOA with SC/APC connectors, 15 dB small signal gain and DC power supplies		

Transport Cube - DWDM Optical Amplifier Unit



Characteristics

- EDFA optical amplifier for DWDM applications
- Fixed unit for 19" rack type installation (1U)
- Output power up to 20 dBm
- Different units for booster and Pre-Amplification
- The system inter-operates with any router, switch, DSLAM, SFP and GBIC,
- which supports the DWDM ITU G.694.1 standard
- Remote management via WebGUI
- In-service replaceable redundant power supplies
- Higher density version available as double line card in the transport cube chassis

Technical data

Attribute		Value
Dimensions (W \times D \times H)		482.6 × 387 × 44 mm
Operating temperature		0 to +50 °C
Storage temperature		-40 to +70 °C
Relative humidity		< 95 % non-condensing
Fiber type		SMF-28 compatible Ø 9/125/250 µm
Optical adapters		SC/APC
Electrical power	AD	100 to 240 VAC
	DC	-48 VDC
Management interface		RJ45

Optical data

Attribute	Value
Operating wavelength	1530 to 1565 nm
Saturated output power	20 dBm
Optical power input booste	-5 to +5 dBm
pre-an	-30 dBm to 0 dBm
Nominal optical input power	+ 3 dBm
Optical output power stability	≤ + 0.5 dB
Gain flatness	≤ 0.3 dB
Polarization sensitivity	≥ 0.3 dB
Polarization mode dispersion	≤ 0.5 ps

Environmental data

Attribute	Value
Free of halogen	yes
2011/65/EC (RoHS)	fully compliant

Transport Cube - DWDM Optical Amplifier Unit - Order Code

Customer-specific DWDM optical amplifier units are available on request. For more details on customer-specific solutions contact your local sales representative or choose from our configurable options in the order code below.

C - 2741	- 2	- 3	-	Rev. A
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1	1 Application mode			
В		Booster		
E		Pre-amp		
2	Out	Output power		
2	0	20		
3	3 Electrical power			
А		100 to 240 VAC		
D		-48 VDC		

Product description: DWDM EDFA amplifier unit Product code: C-2741

Example	C - 2 7 4 1 - B - 2 0 - A - Rev.A

DWDM booster, max. 20 dB, output power, dual AC power supplies

Transceivers



Services provided

- 155 Mbit to multi-100G OSNR testing
- Bit error rate testing
- Power budget testing (output, sensitivity, rise times, fall times, extinction ratios, swing times)
- Optical and electrical eye diagrams
- Dispersion behaviour

Application tests provided

- OEM Transceiver Compatibility
- Protocol Testing
- Interoperability testing between manufacturers
- Standard and extended temperature environment conditions

Optical transceivers - 10G, 40G, 100G and beyond

A vital element of any optical network is the transceiver, and with such a variety of media types, data rates and protocols, choosing the right transceiver can be a challenging task. Vendor specific form factors add to the complexity. As the transceiver becomes more complex, so too does the cabling infrastructure required to support it. Our expertise in both "core optical technologies" and well as "next generation cabling systems" means that you can enjoy continuity across the complete transmission link. HUBER+SUHNER offers transceivers to support all network applications and data rates – from 1G to 100G and beyond. With our extensive manufacturing and test laboratories, we can provide extended support to ensure that the application will delivery consistently every time.

Ordering requirements

In order for us to recommend a transceiver solution, we will require the following system parameters:

A Transceiver type "form factor"/MSA type (example SFP/SFP+/XFP/CXP/CFP/CFP2/CFP4/QSFP/QSFP28)

The transceiver must mechanically and electrically fit into a given piece of active equipment. Transceiver MSAs define mechanical form factors including electric interface as well as power consumption and cable connector types.

B Protocol and data rate (Ethernet: Gigabit Ethernet 10 Gb/s, 40 Gb/s, 100 Gb/s and fiber channel: 2 Gb/s, 4 Gb/s, 8 Gb/s, 16 Gb/s, 32 Gb/s)

C Power budget (dB)

The transceiver power budget is the difference between laser launch power and receiver sensitivity. For distances under 2 km, if the link loss cannot be measured it has to be calculated by adding up individual losses to give a Channel Insertion Loss (CIL). The CIL is made up from the transmission distance × unit loss per length (depends on fiber type), number of connections and number of splices.

D Transport media type/transceiver "color" (example: copper, single mode fiber (SMF), multimode fiber (MMF)

If SMF is used what is the optical transmission spectrum: "gray " (1310/1550 nm) or "colored" (CWDM or DWDM). If CWDM or DWDM are used, channels will need to be specified.

Available options: 850 nm MM/1310 nm gray /1550 nm gray /CWDM (1270 to 1610 nm)/DWDM (100 GHz ch 17 to 61) Bi-Di (please specify wave-length pair), MM = Multimode/all others are singlemode.

E Equipment compatibility/"coding"

In which switch or router is the transceiver required to work? Is the equipment "open for 3rd party transceivers" or "vendor locked"? In the 2nd case, the transceiver has to be coded to be accepted by the equipment, therefore switch or router brand and model must be defined (e.g. Cisco Catalyst 8500).

Available options: Uncoded/none, 3 Com/Alcatel/Arista/Brocade (pls. differ from Foundry)/Ciena/Cisco/Dell/Ericsson/Extreme/Force10/Juniper/HP/ Huawei/Marconi/Nortel/Transmode.

F Other specifications

Usually we provide digital diagnostics with all of our transceivers but in some cases transceivers will be supplied without DMI on request. Operating temperature range: In some cases an extended operating temperature range (-40 to +85 °C) is required, which can be supplied on request. Please specify if there are any other specific requirements that are outside of normal operating specifications and requirements.





Polatis Optical Switching Solutions

HUBER+SUHNER Polatis is the leading provider of all-optical switches, enabling low latency, fully transparent connections between optical fibers without requiring conversion between optical and electrical signals to offer much greater flexibility and energy efficiency. The patented DirectLight® optical switch technology connects fibers with the best possible optical performance. The modular, strictly non-blocking optical switch platform scales from 4x4 to 384x384 ports, applying class-leading performance to provide dynamic connectivity for today's network services.

Polatis all-optical switches are time proven in mission-critical network applications, with key features that enable operators and systems integrators to deliver secure, scalable, reliable, manageable and cost-effective optical cross-connect capabilities.
Polatis Optical Switching Solutions

SDN-enabled all-optical switch

Embedded OpenFlow and NETCONF interfaces enable a faster deployment of new software-defined network solutions.



Industry leading port density

Broadest portfolio available on the market from 4x4 up to 384x384 fiber ports per switch, also available in asymmetric (MxN) and reconfigurable (M-fiber) configurations.

Adds flexibility to today's network services

Automated fiber provisioning, protection, monitoring, reconfiguration and test applications.

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Transparent connectivity and superior performance

Low optical loss and dark fiber switching enables dynamic, bandwidth-agnostic network architectures with minimal system impact and near-zero latency.

Proven track record

The reliable, field-proven DirectLight™ optical switch technology powers more than 2000 systems worldwide.



The Potential of All-Optical Switching

Network operators are searching for bandwidth-on-demand capabilities that allow them to direct network capacity where and when it is needed, with performance guarantees to support latency, jitter and availability requirements for a range of diverse applications. Adoption of dynamic fiber cross-connects to bring the physical layer under software control allows rapid provisioning, protection and reconfiguration of network resources on-demand bringing additional benefits to operators, including:

- Eliminating manual patch errors and the potential for service interruption
- Maintaining current state of physical layer connectivity in a software database
- Creating optical demarcation points in multi-tenant/multi-service provider environments
- Facilitating bridge and roll during equipment commissioning, upgrade and replacement
- Providing physical isolation between virtualized network slices for enhanced security
- Enabling aggregation of optical taps for network monitoring
- Automated protection services for individual or groups of traffic lines

Since all-optical circuit switches do not require any optical-to-electrical conversions, they consume very little energy and add virtually no latency to the data path. Connections are fully transparent and format independent, which makes them ideal for use in network infrastructures where optical transmission rates continually advance.

While individual optical circuit switches can provide up to a few hundred ports of non-blocking connectivity, scaling beyond this level is only possible using multi-stage cross-connect fabrics. These multi-stage fabrics operate within the restricted power budgets of low-cost optical transceivers due to the very low loss characteristics of the Directlight® technology.

SDN-ENABLED All-Optical Switching

Today's Three-Tiered Network Architectures

SDN-enabled all-optical switching is being introduced at a number of levels to optimize network resources in today's network services, alongside existing packet routers and switches. In the application outlined below, all-optical switching is not a replacement for packet switching; it is added to the existing network to bring the capacity, flexibility and scalability needed at key congestion points to meet heavy and persistent traffic demands.

Large networks have clusters of tens of thousands of servers distributed across rooms, buildings and campuses. To provide reliable and scalable interconnections between all of these servers, networks are typically built in tiers using a combination of packet routers and circuit switches at the core/metro, aggregation and access levels. This hierarchy enables efficient sharing of data and provides services across internal networks while also connecting to the outside. All-optical switching can be added to each tier of the network to enhance performance and reduce costs. Graphic 1 shows the basic tiered approach including potential locations for all-optical switching in each tier.

The Potential of All-Optical Switching



Graphic 1

Technology

- DirectLight[®] free-space optical switch technology connects fibers with the best possible optical performance
- Patented 2D piezo beam-steering with integrated position control
- Lowest loss all-optical cross-connect typical 1dB IL
- Modular platform scales from 4x4 thru 384x384
- Available in dual-sided symmetrical (NxN), asymmetrical (MxN) and single-sided (M-fiber) variants
- True transparent dark-fiber switch connections are independent of protocol, bitrate, light color, direction or power level
- Optical power monitoring enables Variable Optical Attenuation (VOA) and Automatic Protection Switching (APS) functionality



Products

Series	Matrix Size	Technology	Optional Functions	Key Features
3000	4x4 to 16x16	DirectLight [™] Multimode		 World's only multimode fiber matrix switch Supports OM1 and OM3/OM4 fibers Available in NxN, MxN configurations
6000	4x4 to 192x192	DirectLight [™] Single mode	• OPM • APS • VOA	 Low insertion loss / superior optical specs Carrier class interfaces (SNMP, TL1, etc.) Available in NxN and MxN configurations Single sided N-fiber variants available SDN enabled with OpenFlow and NETCONF
6000 PSS	4, 8 or 16 Rx/Tx line pairs Protection Services	DirectLight TM Single mode		 Compact 1+1 optical layer protection Up to 16 services in 1U, < 25 watts Pre-configured, drop in APS system Automatic LOS protection and restoration
7000	208x208 to 384x384	DirectLight™ Single mode	• OPM • APS • VOA	 Superior optical specs NxN and MxN configurations SDN enabled carrier-class interfaces Low power, resilient architecture

OPM - optical power monitor

 $\mathsf{APS}-\mathsf{automatic}\ \mathsf{protection}\ \mathsf{switching}$

VOA – variable optical attenuation



Technical Annex

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Standards

Standards governing the design, installation, commissioning and operation of structured cabling systems, and the particular environments they operate within can be complex and confusing. There are 3 main Standardization bodies across the world and depending on where the installation takes place; they have an order of precedence.

International

The Joint Technical Committee 1 (JTC1) of the International Organisation for Standardization (ISO) and the International Electrotechnical Commission (IEC) is the main body for producing such standards. IEC provides the interface, performance and test standards for components.

Europe

The European Committee for Electrotechnical Standardization (CENELEC) is the overall authority for the production of standards within Europe. Various national committees also exist in many of the European countries and may take their national standards from any of the larger standards bodies. National standards are not allowed, where European standards exits. The countries have to adopt the normative European standards (EN).

North America

In North America (including Canada), the Telecommunications Industry Association (TIA) is the relevant Standardization body, although the structure of its standards is slightly different (and in some cases deviating) to that of ISO, IEC and CENELEC. There is extensive harmonization between CENELEC, ISO and IEC bodies, some of the differences with TIA are in the exact wording, designation and structure used. However TIA harmonizes standards with ISO and IEC wherever possible.

HUBER+SUHNER is a global company, supplying a globally suitable products, which references international standards component compliance as a preference. However, the precedence of local standards is typically most relevant in the design and installation requirements rather than components and typically will reference the same international component standards.

If there is any doubt on the compliance to any local standard, please contact your local application engineer who will be happy to clarify the situation.

CENELEC FN

ISO IEC

TIA

Standards Listings

Design, planning and installation

- ISO/IEC 11801:2002/Amd 2:2010/Cor 1:2010 Information technology - Generic cabling for customer premises
- ISO/IEC 24764:2010/Amd 1:2014 Information technology - Generic cabling systems for data centers
- ISO/IEC 14763-1:1999 + Amd 1:2004 Information technology - Implementation and operation of customer premises cabling -Part 1: Administration
- ISO/IEC 14763-2:2012
 Information technology Implementation and operation of customer premises cabling -Part 2: Planning and installation
- ISO/IEC 18010:2002/Amd 1:2005 Multi-tenant Pathways and Spaces
- EN 50173-5:2007/A2:2012 Information technology - Generic cabling systems - Part 5: Data Centers
- EN 50600-2-4: 2015
 Information technology Data center facilities and infrastructures Part 2 to 4: Telecommunications cabling infrastructure
- EN 50174-2:2009/A2:2014 Information technology – Cabling installation – Part 2: Installation planning and practices inside buildings
- ANSI/TIA-568.0-D (September 2015) Generic Telecommunications Cabling for Customer Premises
- ANSI/TIA-942-A (August 2012)/A-1 (March 2013) Telecommunications Infrastructure Standard for Data Centers

Comissioning and handover

- ISO/IEC 14763-3:2014/Cor 1:2015
- Information technology Implementation and operation of customer premises cabling - Part 3: Testing of optical fiber cabling
- IEC 61280-4-1:2009
- Fiber optic communication subsystem test procedures Part 4-1: Installed cable plant - Multimode attenuation measurement
- IEC 61935-1:2015
 Specification for the testing of balanced and coaxial information technology cabling Part 1: Installed balanced cabling as specified in ISO/IEC 11801and related standards
- EN 50346:2002/A2:2009 Information technology - Cabling installation - Testing of installed cabling

More standards exist than listed above. They are listed on the websites of the standardization organisations.

Ethernet (LAN)

Application	Fiber type	Channel length, max., m	Wavelength, nm	No. of fibers	Optical loss budget for cabling, dB	Source	Physical inter- face
IEEE 802.3: 1000BASE-SX 1)	ОМЗ	1000 2)	850	1+1	3.56	*	serial
IEEE 802.3: 1000BASE-SX 1)	OM4	1100 2)	850] +]	3.56	*	serial
IEEE 802.3: 10GBASE-SR/SW 1)	OM3	300	850] +]	2.6	*	serial
IEEE 802.3: 10GBASE-SR/SW ^{1]}	OM4	550 ²⁾	850] +]	2.6	*	serial
IEEE 802.3: 40GBASE-SR4 1)	OM3	100	850	4+4	1.9	*	parallel MPO
IEEE 802.3: 40GBASE-SR4 1)	OM4	150	850	4+4	1.53	*	parallel MPO
IEEE 802.3: 100GBASE-SR4 1)	OM3	70	850	4+4	1.9	*/**	parallel MPO
IEEE 802.3: 100GBASE-SR4 1)	OM4	100	850	4+4	1.53	*/**	parallel MPO
IEEE 802.3: 100GBASE-SR10 1)	OM3	100	850	10+10	1.9	*	parallel MPO
IEEE 802.3: 100GBASE-SR10 1)	OM4	150	850	10+10	1.53	*	parallel MPO
IEEE 802.3:1000BASE-LX 1)	OM3	550	1300] +]	2.35	*	serial
IEEE 802.3:1000BASE-LX 1)	OM4	550	1300	1+1	2.35	*	serial
IEEE 802.3:1000BASE-LX	OS2	5000 2)	1310] +]	4.56	*	serial
IEEE 802.3:10GBASE-LR/LW	OS2	10 000 2)	1310] +]	6.2	*	serial
IEEE 802.3:10GBASE-ER/EW	OS2	30 000 2)	1550] +]	10.9	*	serial
IEEE 802.3:40GBASE-LR4 (DWDM)	OS2	10 000 2)	1310] +]	6.7	*	serial
IEEE 802.3:100GBASE-LR4 (DWDM)	OS2	10 000 2)	1310] +]	8.3	*	serial
IEEE 802.3:100GBASE-ER4 (DWDM)	OS2	40 000 2)	1550] +]	18	*	serial

Fiber Channel (SAN)

Application	Fiber type	Channel length, max., m	Wavelength, nm	No. of fibers	Optical loss budget for cabling, dB	Source	Physical interface
1 Gb/s FC	ОМЗ	500	850	1+1	2.62	*	serial
1 Gb/s FC	OM4	500	850] +]	2.62	*	serial
2 Gb/s FC	OM3	150 ^{A]} , 300 ^{B)}	850] +]	3.31	*	serial
2 Gb/s FC	OM4	150 ^{A]} , 300 ^{B)}	850] +]	3.31	*	serial
4 Gb/s FC	OM3	150 ^{в)} , 300 ^{⊂)}	850] +]	2.88	*	serial
4 Gb/s FC	OM4	420 ^{D)}	850] +]	3.02	*	serial
8 Gb/s FC	OM3	50 ^{b)} , 150 ^{C)}	850] +]	2.19	*	serial
8 Gb/s FC	OM4	190 ^{D)}	850] +]	2.22	*	serial
16 Gb/s FC	OM3	35 ^{B)} , 100 ^{C)}	850] +]	1.95	*	serial
16 Gb/s FC	OM4	125 ^{D)}	850] +]	1.97	*	serial
32 Gb/s FC	OM3	tbd	850] +]	tbd	**	serial
32 Gb/s FC	OM4	tbd	850	1+1	tbd	**	serial

* included in published standard ISO/IEC 11801 ed2.2

** conditionally; current in draft of ISO/IEC 11801 ed3.0

 These applications are bandwidth limited at the channel lengths shown. The use of lower attenuation components to produce channels exceeding the values shown cannot be recommended.

2) Longer possible lenght is shown as it is specified in the referenced standard.

A) Minimum cabled optical fiber performance of category OM1 is specified.
B) Minimum cabled optical fiber performance of category OM2 is specified.
C) Minimum cabled optical fiber performance of category OM3 is specified.
D) Minimum cabled optical fiber performance of category OM4 is specified.

Color Codes

Color codes for fiber identification according to standard

Number	ANSI/TIA-598
1	blue
2	orange
3	green
4	brown
5	gray
6	white
7	red
8	black
9	yellow
10	violet
11	pink
12	aqua

Optical Performance

Unless specifically requested, HUBER+SUHNER supplies all multimode OM3 and OM4 assemblies terminated with MTP elite ferrules. This not only ensures that optimum performance is obtained across a mated pair connection but also allows more flexible, structured links to be constructed without exceeding the specified channel insertion loss (CIL) for the application(s) that the cabling is designed to support. It is important to note that HUBER+SUHNER supplies all singlemode MTP connectors with a green connector shroud to signify APC.

Optical performance

Туре	Measurement method (IL/RL)	IL (dB)	RL (dB)
SMUPC	IL: IEC 61300-3-4 method B	≤ 0.30	≥ 50
SM APC	RL: IEC 61300-3-6	≤ 0.30	≥65
MM OM3	IL: IEC 61300-3-34 method B	≤ 0.25	≥ 35
MM OM4	RL: IEC 61300-3-6	≤ 0.15	≥ 35

Performance classes MTP connector

Туре	Measurement method (IL/RL)	IL (dB) typical all fibers/ max. single fiber	RL (dB)
SM MT elite (8, 12 and 24 fiber)	IL tested per IEC 61300-3-4 method B	0.10/0.35	≥60
	RL tested per IEC 61300-3-6 method B		
MM MT elite (8, 12 and 24 fiber)	IL tested per IEC 61300-3-4 method B	0.10/0.35	≥ 30
	RL tested per IEC 61300-3-6 method B		

Multimode MT elite ferrule as tested with proposed encircled flux launch condition on 50 µm fiber and 850 nm per IEC 61280-4-1 Singlemode MT elite ferrule compliant with proposed IEC 61755-3-31/GRADE B

MTP[®] Connectivity

MTP adapters supplied by HUBER+SUHNER are standard as TIA type "A", meaning a key-up to key-down arrangement. Uniquely, however, it is also possible to alter the configuration in the field, if and where necessary, to the TIA type "B", meaning key-up to key-up.

The type of adapter used is critical to the correct functioning of the cabling channel so caution must be used when making changes of this kind. Please contact your local HUBER+SUHNER applications engineer to advise on any changes.

The HUBER+SUHNER MTP adapter is suitable for singlemode and multimode, 8-fiber, 12-fiber and 24-fiber mated connections. The Type of interface and number of fibers contained within are identified by the shroud.

Keyway Marking - Adapters

MTP adapters are fitted into the patch, transition and conversion modules types as an "A" type, with keyways up and down (key-up, key-down). The "A" indication will be visible on top of the colored shroud which indicates that this keyway is uppermost, so the plug being inserted should be aligned with its keyway upwards as shown below.

MTP® Connector Type Identification

Due to the increased use of MTP connectors with different numbers of fibers terminated within, HUBER+SUHNER now use a color coding system to enable the user to easily distinguish between, using the same colors found on the MTP adapter shrouds. Gray represents 8 fibers, black represents 12 fibers and red represents 24 fibers.







MTP[®] Gender



MTP connectors are available as a male (with pins) and female (without pins). A male MTP connector must always be mated to a female MTP connector so that the ferrules are correctly aligned. Failure to adhere to this rule will result in a dark connection and potential permanent damage to the connector end-faces.

MTP transceivers of any form factor (QSFP, QSFP28, CFP, CFP2, CXP, etc) are typically supplied with a male interface, the final equipment connection shall be with a female connector. Transceiver damage can occur if this is not adhered to. If in doubt, please consult the relevant manufacturers' specification and/or visually inspect the interface before designing the cabling system.

- HUBER+SUHNER supplies 8F modules, fiber trays and short fan-outs (less than 5 m) with female connectors, and backbone cables such as link assemblies and trunk harnesses with a male connector.
- HUBER+SUHNER supplies 12F modules, fiber trays and short fan-outs (less than 5 m) with male connectors, and backbone cables such as link assemblies and trunk harnesses with a female connector.
- HUBER+SUHNER supplies 24F short fan-outs and equipment cords (less than 5 m) with female connectors, and backbone cables such as link assemblies and trunk harnesses with a male connector.

Other options are available upon request – please contact your local HUBER+SUHNER applications engineer to advise on any changes of this kind.

Gender matching requires careful design and planning, particularly when a customized link is implemented. In some cases (such as links to SAN switches), it may be necessary to eliminate one mated pair of MTP connections and route long fan-outs directly from the switch back to the Main Distribution Area (MDA). In the case of an 8F system, a fan-out with a male connector should be used because it will be connected directly with a female connector at the fiber tray.

If you have any doubt about gender matching – please contact your local HUBER+SUHNER applications engineer.

MTP® Cleaning Instructions



Pathway Capacity



Cable pathway systems can be specified in a number of different sizes to accommodate varying quantities of cables. Cables vary significantly in the space they require in pathways, and pathway sizing is a significant element for consideration in the long term upgradability of a network area in ensuring that there is sufficient space for additional cables required during the lifetime of the facility.

The HUBER+SUHNER pathways system, described in the table below, shows the average capacity of different cable types. It is important to note that the higher quantity figures are based on full cross sections of the main bends and straight pathway elements that are connected with joiners – they do not represent the retrofitable top outlets. The first row (100 × 45 mm) accurately represents the useable space that a top outlet or horizontal outlet will produce.

The cable sizes reflect the various cables we use for backbone links such as MTP trunks. We have included data about patch cord sizes although we recommend that whenever possible, patch cords are not guided through a pathway system – only for use within the rack, not between racks.

Careful attention should also be given to the capacity of the top outlets because these represent the smallest cross-section when linking two cabinets in the network. To avoid bottlenecks, make sure that the quantity of cables per cabinet is clearly understood and planned in advance.

The cable quantity table below shows a 40 % and 60 % fill ratio. We recommend that all calculations are based on 40 % on day 1 to allow for future expansion and upgrades. Please contact your local HUBER+SUHNER applications engineer who will be able to assist you with a specific configuration.

Pathways cross	Cable type and overall diameter (mm)									
sectional area (mm ²)	2.0 mm		2.1 mm		3.0 mm		6.0 mm			
	simplex 8/12f 1 × 12f unit		simplex 2f 1 × 2f unit		simplex 24f 1 × 24f unit		simplex 32/48f 4 × 8/12f units			
% fill	40 %	60 %	40 %	60 %	40 %	60 %	40 %	60 %		
4500	450	675	408	612	200	300	50	75		
10 000	1000	1500	907	1361	444	667	111	167		
16 000	1600	2400	1451	2177	711	1067	178	267		
22 000	2200	3300	1995	2993	978	1467	244	367		
30 000	3000	4500	2721	4082	1333	2000	333	500		

Pathways cross	Cable type and overall diameter (mm)								
sectional area (mm ²)	7.4 mm		8.6 mm		9.9 mm				
	simplex 48/72f 6 × 8/12f units		simplex 64/96f 8 × 8/12f units		simplex 96/144f 12 - 8/12f units				
% fill	40 %	60 %	40 %	60 %	40 %	60 %			
4500	33	49	24	37	18	28			
10 000	73	110	54	81	41	61			
16 000	117	175	87	130	65	98			
22 000	161	241	119	178	90	135			
30 000	219	329	162	243	122	184			

Patch Cords

Calculating patch cord lengths in HUBER+SUHNER racks

HUBER+SUHNER recommend that whenever possible, patch cords should only be used for in-rack connections. This simplifies Moves, Adds and Changes (MACs) and reduces the cable mass generated by thousands of cross-network connections.

In some cases, it will be necessary to position more than one rack together so that a higher density cross-connect can be achieved. In such cases, the patch cord lengths will need to be adjusted accordingly. The figure and table hereafter show how the various segments of the racks correspond to different patch cord lengths.



Rack 1		:k 1	Rack 2		Rack 3		Rack 4		
		А	В	С	D	E	F	G	Н
Devels 1	A	3.5 m	5 m	9 m	8 m	10 m	9 m	11 m	10 m
KOCK I	В	5 m	3.5 m	8 m	5 m	9 m	6 m	10 m	7 m
Davida O	С	9 m	9 m	3.5 m	5 m	9 m	8 m	10 m	9 m
KOCK Z	D	8 m	5 m	5 m	3.5 m	8 m	5 m	9 m	9 m
Davala 2	E	10 m	9 m	9 m	8 m	3.5 m	5 m	9 m	8 m
Kack 3	F	9 m	9 m	9 m	5 m	5 m	3.5 m	8 m	5 m
Davala 4	G	ll m	10 m	10 m	9 m	9 m	8 m	3.5 m	5 m
Kack 4	Н	10 m	7 m	9 m	9 m	8 m	5 m	5 m	3.5 m

Copper - Channel Design

Copper cabling systems are well defined in national and international standards and follow a simple, modular design. These use 4 possible configurations which allow the cabling designs to be guaranteed to deliver the performance required in a layout that suits the user environment best.

Inter-connect EO	This is the most simple and straightforward of the designs which provides a single fixed element of cabling (the zone distribution cable) and is attached to active equipment (EQP) using a patch cord at each end.
Inter-connect LDP-EO	This is the next stage of complexity which adds an LDP-EO link to the single fixed element of cabling (the zone distribution cable) and is attached to active equipment (EQP) using a patch cord at each end. This gives a more flexible cabling channel and allows the final con- nections to be supplied from "concentration points" and adapted locally without affecting
	the fixed cabling element.
Cross-connect EO	This adds a cross-connect into a conventional zone distribution cable, which allows the switch equipment to be located remotely from the zone cabling patching area. It means that all switch connections can be made by simply patching between patch panels within the cross-connect area to complete the connection. This is a simpler and lower risk method
	because the switch (which may have many hundreds of connections to it) is cabled once as it is initially installed and is then never disturbed by repeated patching changes and addi- tions. It can also allow the switch ports to be distributed to different areas to increase resiliency of equipment and at a longer distance than a conventional equipment cord will allow.
Cross-connect LDP-EO	This has all of the benefits of the cross-connect and the LDP-EO – the designs are combined together to give the advantages of flexibility at both ends of the cabling system. This means that the destination cabling in the server rows can be simply reconfigured, plus the switch supplying this connection is pre-cabled, avoiding disruption.

Design Rules

Length limitations on specific elements of the cabling system are shown in the tables below. These should be used if the cabling design is outside of the baseline segment lengths and/or the ambient temperature of operation. Segments shown in the table below relate to the diagrams for each design on following pages.

Temperature: 20 °C is the baseline temperature at which the limits below apply.

Segment	Minimum length (m)	Maximum length (m)
ZD-LDP	15	85
LDP-EO	5	-
ZD-EO (no LDP)	15	90
Equipment cord at EO	2 ^a	5
Patch cord	2	-
Equipment cord at ZD	2 ^{b]}	5
All cords	-	10

Horizontal link length equations

	Class E and EA channels
Interconnect - EO	H=107-3a-FX
Interconnect – LDP-EO	H=106-3a-FX-CY
Cross-connect-EO	H=106-3a-FX
Cross-connect LDP-EO	H=105-3a-FX-CY

Н	Max. length of fixed horizontal cable (m)
F	Combined length of patch, equipment and work area cords (stranded) (m)
Х	Ratio of cord cable insertion loss: fixed horizontal cable insertion loss = 1.5
Y	Ratio of LDP cable insertion loss: fixed horizontal cable insertion loss = 1 (if solid cable is used in LDP) or 1.5 (if stranded cable is used in LDP)
С	Length of LDP cable (solid) (m)
Shielded cabling	For operating temperatures above 20 °C, H should be reduced by 0.2 % for every degree above 20 °C
Unshielded cabling	For operating temperatures between 20 and 40 °C H should be reduced by 0.2 % for every degree above 20 °C
Unshielded cabling	For operating temperatures between 20 and 40 °C H should be reduced by 0.6 % for every degree above 20 °C

Stranded cable is used to manufacture cords (patch or equipment) and due to its construction has a greater attenuation than that of the equivalent solid conductor cable used in fixed horizontal (zone) cabling and LDP cables. The total length of stranded cable in the channel is limited to 10 m. If the design requires more than 10 m of stranded cable in the channel then the overall length limit of the channel must be reduced to compensate as per the calculations in the table above.

Additionally, if the temperature of operation is above 20 °C then the channel shall be de-rated to take into account the increase of attenuation with temperature as per the calculations in the above table.

a) If there is no LDP, the minimum length of the equipment cord is 1 m.

^{b)} If there is no cross-connect, the minimum length of the equipment cord is 1 m.

Glossary

Balanced Cable	A cable construction technology used in copper structured cabling systems that generally utilizes 4 pairs of twisted conductors, which are "balanced" together to provide a suitable medium for data transmission when used in conjunction with suitable connectors (typically RJ45 type). Can be produced in shielded (screened) or unscreened form. The balancing ensures consistent performance on each pair.
CDR	Stands for "Cable Distribution Rack" which is the optical distribution rack built specifically to support high-density, high-managability data center cabling systems.
CENELEC	European Committee for Electrotechnical Standardization – the governing standards body within EU that covers structured cabling systems. Closely aligned to ISO standards in technical content.
Conversion Assembly/ Module	A cable assembly or a pre-terminated module that has 2 different types of MTP connector fitted. For example, a 24F MTP converted to 3 × 8F MTP connectors. It is different from a transition assembly/ module because it is MTP in and MTP out.
Data Center	A structure, or group of structures, dedicated to the centralized accommodation, interconnection and operation of information technology and network telecommunications equipment providing data storage, processing and transport services together with all the facilities and infrastructures for power distribution and environmental control together with the necessary levels of resilience and security required to provide the desired service availability. (Definition by ISO)
DCMS	Data Center Management Software
EDA	Equipment Distribution Area
EN	European Normative – a designation given to a standard written by the CENELEC organisation that has applicability throughout the EU.
EO	Equipment Outlet – fixed connecting device for terminating the zone distribution cabling and providing the interface to the equipment cabling.
FBH	Floor box high density
F/FTP	A term used to describe the detailed construction of a balanced cable – stands for foil overall shield, with each pair individually foil covered.
F/UTP	A term used to describe the detailed construction of a balanced cable – stands for foil overall shield, with each pair unshielded.
Front Access	Access to fibers and adapters from the front rack, where usually a door is located.
Fiber Tray (FT)	A splice or distribution cassette with telescopic hinged functionality holding fibers, splice connections and/or adapters. The FT has lateral fiber access to adapters called side access.
FOCIS	Fiber Optic Connector Intermateability Standard, referenced to TIA, generally used in North America.
IEC	IEC International Electrotechnical Commission – the standardization body that provides the interface, performance and test standards for components.
IEEE	Institute of Electrical and Electronics Engineers – the body that produces many of the applications standards, particularly those of the Ethernet type.
ISO	International organization for standardization
LC	Lucent connector, type of cylindrical ferrule Small Form Factor (SFF) optical fiber connector
LC Classic	Lucent connector classic
lCHD	Lucent connector high-definition
lchq	Lucent connector high-quality
LCXD	Lucent connector extreme-density

Glossary

LDP	Local Distribution Point – connection point in the zone distribution cabling subsystem between a zone distributor and an equipment outlet
LFF	Large form factor (connector) – such as SC, ST type
Link Losses	The sum of all losses in a fiber cabling system and includes fiber attenuation factor, mated connector pairs and splices but excludes equipment cord cable attenuation and the equipment connection itself.
LISA	Leading Interconnect Systems Approach – HUBER+SUHNER is using this term for passive optical network solutions with different application specifications.
LSFH™	An acronym used to describe the characteristics of the standard HUBER+SUHNER cable jacket material, which stands for "Low smoke and free of halogens".
MAC	Moves, Adds and Changes – the sometimes complex process by which users, equipment and services are altered and re-provisioned.
MDA	Main Distribution Area – the area that houses the distributor used to make connections between the main distribution cabling subsystem, network access cabling subsystem and cabling subsystems (as specified in ISO/IEC 11801) and active equipment.
МСМ	Multi-circuit management – a type of splice tray design that allows multiple optical circuits (often 24 or 48 fibers) to be managed in a single splice tray.
MM	Multi Mode (or multimode) - an optical technology description which is generally used in short distance communications (sub 2 km) but basically describes the method by which the light passes along the glass - by multiple "modes" or paths. Requires a less precision of components to ensure alignment of the core (50 to 62.5 microns), but needs a more complex manufacturing method for the glass.
MTP	Mechanical Transfer Push-Pull – an enhanced version of the MPO connector offering higher optical perfomance, repeatability and reliability.
MTP Link Assemblies	Cable assemblies using 12 fiber cable with MTP connectors terminated at either end.
MPO	Multi-fiber push-on – an optical connector, standardized under IEC 61754-7:2008 which provides an interface for up to 24 fibers utilising individual rows of up to 12 fibers, in a polymeric ferrule.
ODR	Optical Distribution Rack – interconnects incoming and outgoing optical fiber in a controlled way. Each fiber can be connected to every other fiber within the rack by simple patching.
ODU	Optimized Distribution Unit – subrack that can be front mounted to any 19 in rack.
OM3	Optical multimode class 3 – only available in the market with 50 µm diameter core and is now considered the minimum bandwidth suitable for LAN and data center applications. It is the first "laser optimized" multimode optical fiber and was developed to provide increaded bandwidth (and hence reach) for VCSEL 850 nm opto-electronnic devices, such as used in 10 GBASE-SR.
OM4	Optical multimode class 4 – only available in the market with 50 µm diameter core and is now considered the most future-proofed class, suitable for LAN and data center applications. It is the second "laser optimized" multimode optical fiber, offering more than double the bandwidth of OM3 at the critical 850 nm wavelength.
OS2	Optical singlemode class 2 – this is often described as "low water peak" singlemode, and offers both lower attenuation and a flatter attenuation curve in the wavelengths between the traditional 1310 and 1550 nm than OS1, to allow wave division multiplexing-based applications to utilise the previously unavailable zone found between those wavelengths.
Patch Cord	Strain-relieved cable assembly with connectors on both ends used to cross-connect individual links. Can also be used to connect links to transceivers and when added to a link, create a channel.
Pigtail	Cable assembly with connector on one end; typically cable diameter 0.9 mm

Glossary

RJ 45	Registered jack, Type 45 – a term generally used to describe a 8P (8 position), 8C (8 contact) RJ-style connector, and can be gendered male of female. Typically supplied in ethernet transceivers and then used in the structured cabling system within the LAN and data center. Cabling systems using this connector are typically limited to a channel length of 100 m with a maximum of 4 connections at 500 MHz and Category 6A/Class EA channels.
SAN	Storage Area Network: A network that is designed specifically for the needs of storage devices. Often a separate cabling system is used due to the frequent use of the FC (Fiber Channel) transmission protocol and specific FC transceivers.
SC	Subscriber connector, a type of optical fiber connector
SCM	Single-circuit management
SFF	Small Form Factor connector with a diameter 1.25 mm ferrule, this size allows a higher density. Available types: LX.5, LC, MU.
S/FTP	A term used to describe the detailed construction of a balanced cable – stands for braid overall shield, with each pair individually foil covered.
Side Access	Adapters and connectors are side facing
SM	Single Mode (or singlemode) - an optical technology description which is generally used in long distance communications but basically describes the method by which the light passes along the glass – by a single "mode" or path. It requires a greater precision of components to ensure alignment of the very small core (8 to 10 microns).
Splice	Permanent joint between 2 optical fibers, created by fusion (heat), clamping or gluing.
TIA	Telecommunications Industry Association – U.S standards creation body for structured cabling systems, components and test methods, also generally adopted by Canadian Standards Association.
Transition Assembly	An assembly of cabled optical fibers and connectors, with an array connector at one end and simplex or duplex connectors at the other end. Typically used within a transition module or as a ruggedized assembly to make the primary connections into a switch "blade".
U/FTP	A term used to describe the detailed construction of a balanced cable – stands for no overall shield, with each pair individually foil covered.
U/UTP	A term used to describe the detailed construction of a balanced cable – stands for no overall shield, with each pair unshielded. More commonly referred to as "UTP".
ZDA	Zone Distribution Area
ZDPHD	Zone Distribution Panel High Density

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