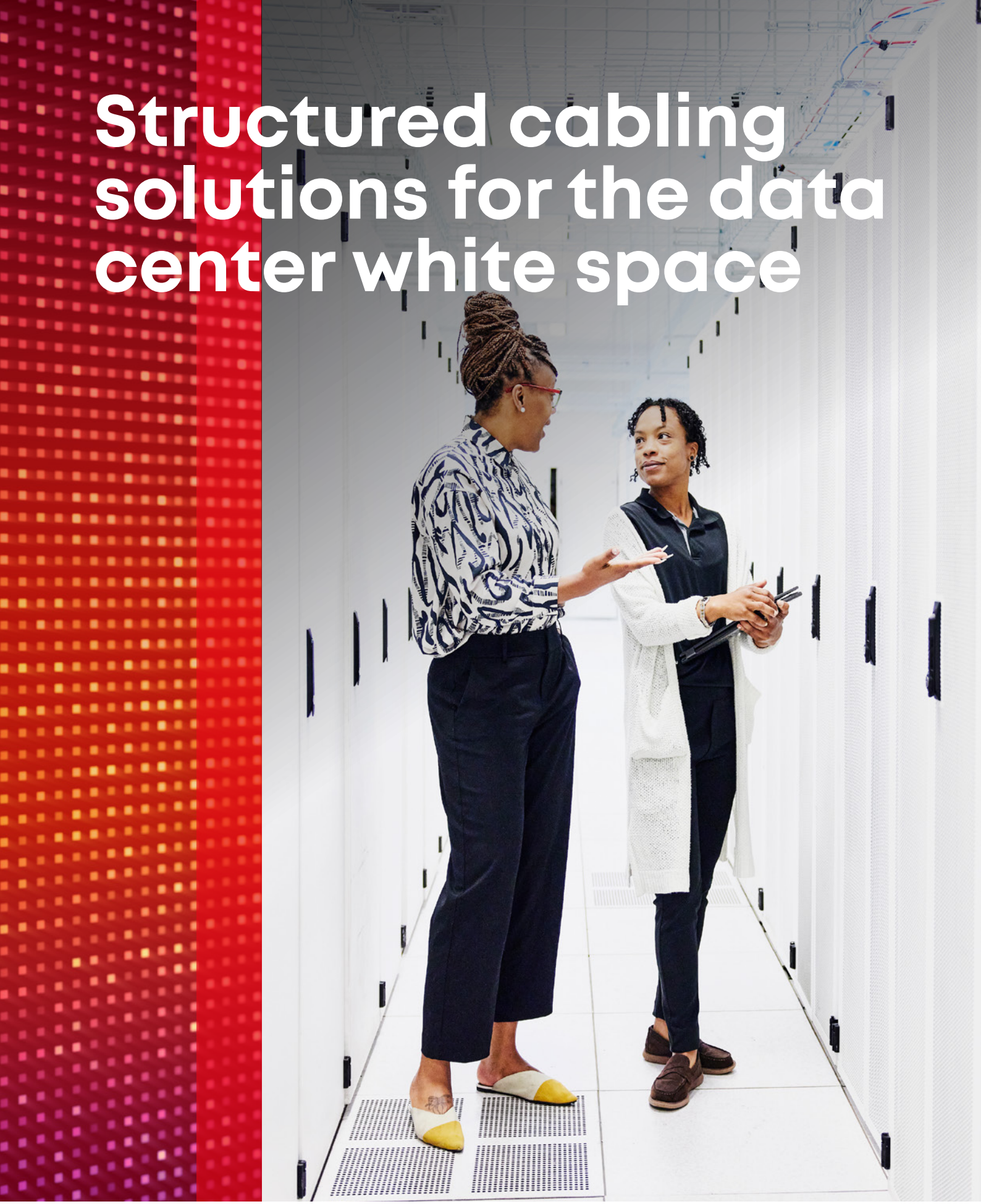
Structured cabling solutions for the data center white space



hubersuhner.com

HUBER+SUHNER

Discover how structured cabling simplifies your cloud infrastructure

Structured cabling enables you to make the most out of your white space through straightforward and high-density fiber cable management. Our pre-selected cabling solutions maximise the performance of your setup and save you time through easy installation and reduced maintenance needs.

Our versatile and scalable solutions are ready for direct deployment into your white space. You will be able to set up a hassle-free and efficient cloud infrastructure, secure the efficiency of your investment and set your system up for growth, all while focusing on your core business.

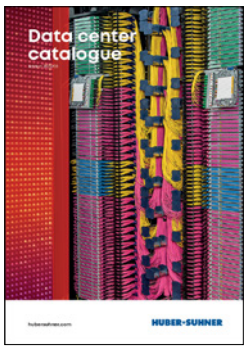
Optimise your space
Make the most out of your white space with high-density cable management solutions that keep it neat and organised.

Boost your performance
Improve the performance of your system by deploying simple solutions that are easy to maintain and manage.

Hassle-free procurement
Benefit from our one-stop-shop offering for cable management solutions and set up your white space with the right cabling from the get-go.

More to explore
For more information on our entire portfolio of data center products, check out the HUBER+SUHNER data center catalogue.

Data center catalogue

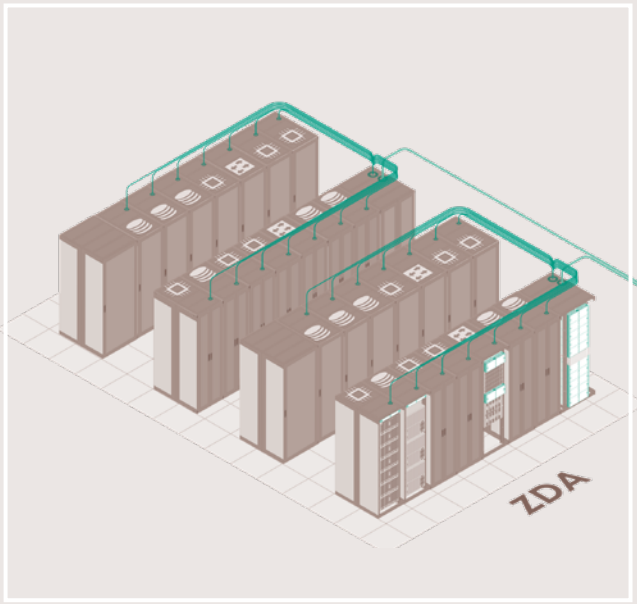


Data center zones and areas

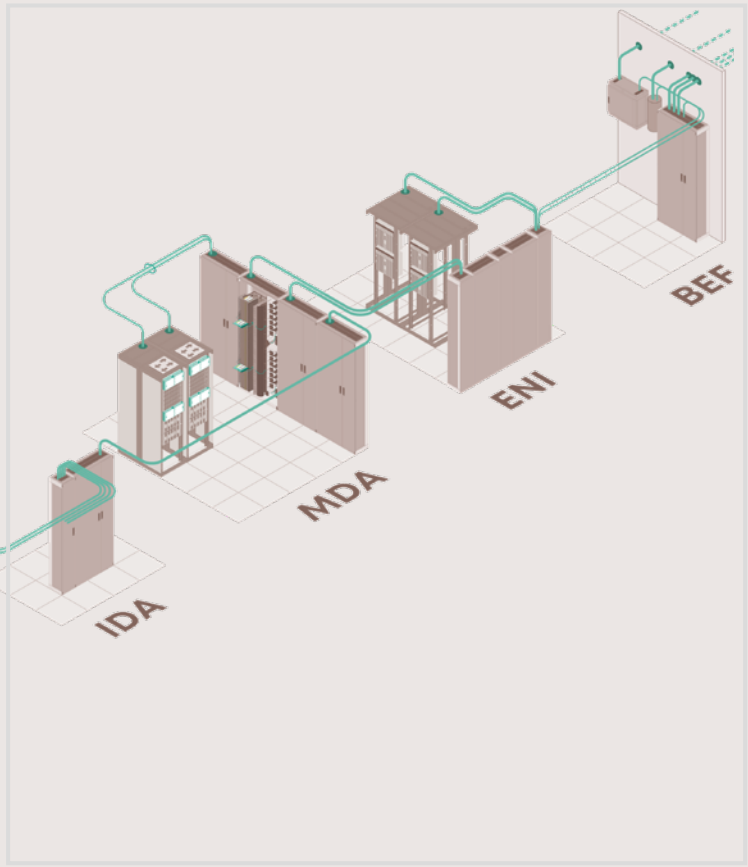
Within our data center portfolio, we offer solutions specifically developed for structured cabling in your white space. By deploying our fiber management solutions into your dedicated white space, you enable a simple, stable and upgradeable physical layer that lasts.

The white space of a data center refers to the area that holds the tenants' IT hardware for private and hybrid clouds. Grey space, in turn, is the area reserved for supporting engineering infrastructure.

Customers manage cabling in the Zone Distribution Area (ZDA). The data center operator then takes overall responsibility for the backbone cabling and connections into the ZDA. Carriers and dark fiber providers install their cables within the Meet-Me Room (MMR) or Building Entrance Facility (BEF).

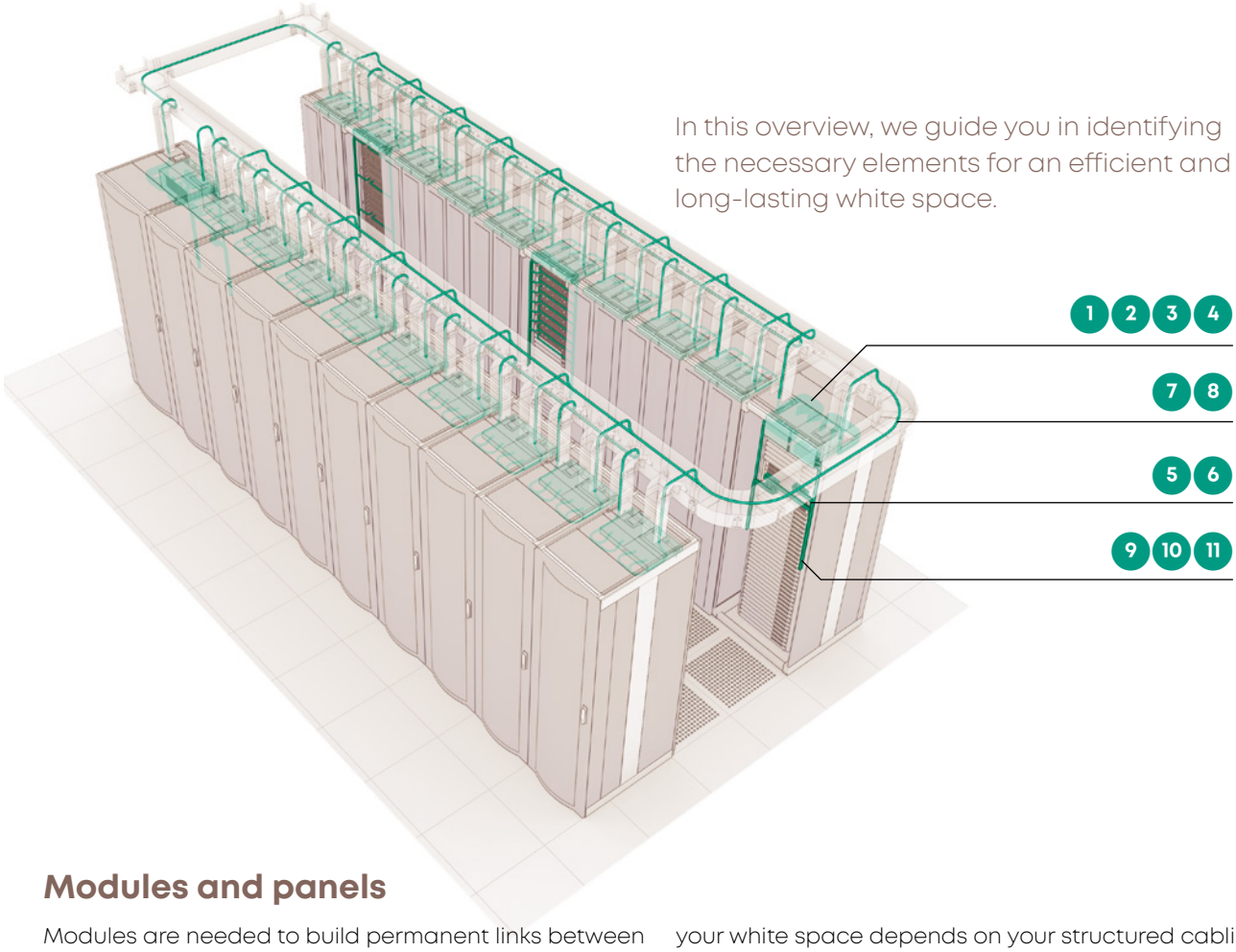


The white space



The grey space

Elements needed to set up structured cabling in your white space



In this overview, we guide you in identifying the necessary elements for an efficient and long-lasting white space.

Modules and panels

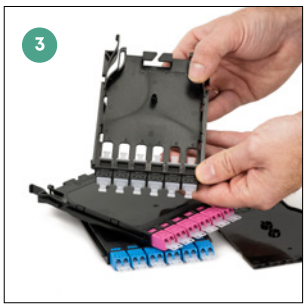
Modules are needed to build permanent links between racks. They provide adapter interfaces to the end of the cables which connect the modules. Modules come in different types and sizes. The modules you need for your white space depends on your structured cabling scenario, the type of transceivers used, as well as your spending plan.

Transition modules

MTP at the rear and LC duplex at front. To be used with MTP Pro jumpers **(8)**. Allows rapid plug-and-go connections without the need for splicing.

Splice modules

With LC adapter at front. To be used with all kinds of FO cables **(7)**. Protects the spliced cables and ensures an optimal bend radius.



Patch modules

MTP or LC both from rear and front. To be used with MTP Pro jumpers **(8)** and duplex assemblies **(9)**. No splicing required.

Patch panels and accessories

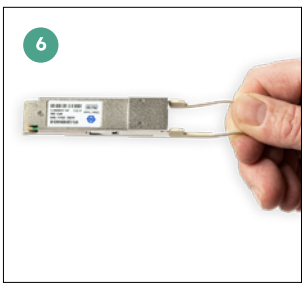
Patch panels are enclosures for modules of different sizes and numbers. Typically they are mounted on the top of the racks.

Transceivers

Technically speaking, transceivers are not part of structured cabling. However your structured cabling setup has to match the specifications of the transceivers in your system (type of connector, singlemode or multimode and operating distance). The main distinction is between duplex and parallel transceivers. Transceivers are part of our portfolio.

Duplex transceivers

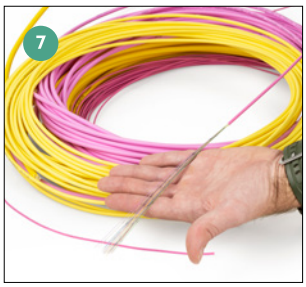
Transceivers for two fibers. They are equipped with a LC duplex interface.



Parallel transceivers

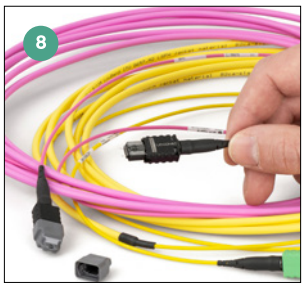
Transceivers for 8 fibers. They are equipped with a MPO interface. They are also called MPO transceivers.

Cables



Fiber optic cables

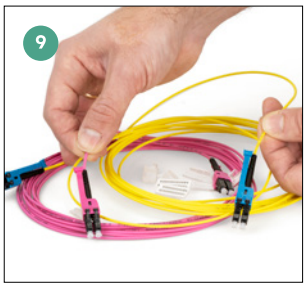
Different types (length, number of fibers) of cables. They need to be spliced and are used together with splice modules **(2)** to build links.



MTP Pro jumpers

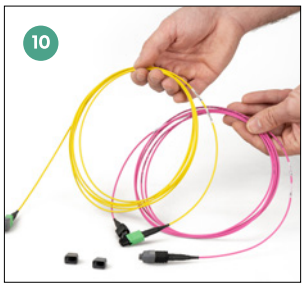
To be used outside the rack with transition modules **(1)** and patch modules **(3)** to build links between racks. For extra strength and better fire protections, they are thicker than MTP Pro patch cords.

Patch cords and assemblies



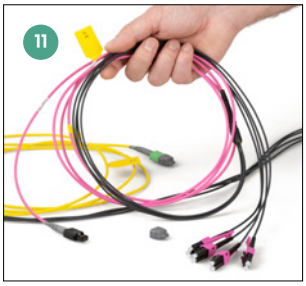
Duplex assemblies

To be used inside racks for in-rack and direct-connections and also together with patch modules **(3)** to build links between racks



MTP Pro patch cords

Similar to MTP Pro jumpers **(8)**, but to be used inside the racks.



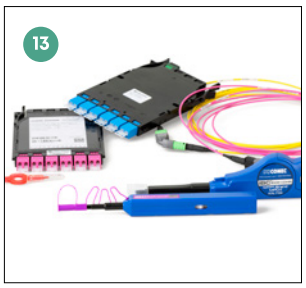
Harness cables

Connect parallel to 4 duplex transceivers. To be used in direct-connect breakout applications scenarios inside the same rack.

Tools

MTP Pro tools

Needed to adjust MTP Pro jumpers and patch cords to ensure compatibility and allow more cabling scenarios.



Cleaning tools

Tools to clean end faces of fibers if needed.

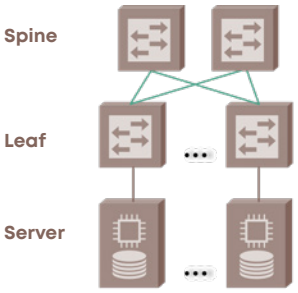
Network architectures

Our structured cabling portfolio enables data center tenants to set up modern network architectures in their white space. The most common are top-of-rack and end-of-row cabling architecture. Both are fully supported by our portfolio.

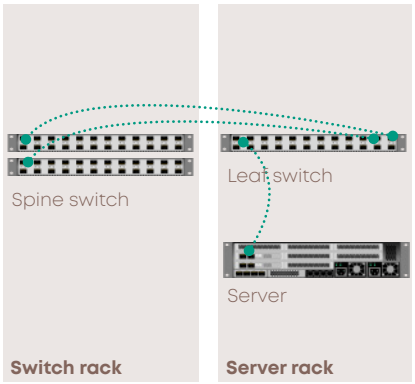
Top-of-rack architecture

In a top-of-rack architecture, structured cabling provides the physical path for connections between the spine switch in the switch rack to leaf or top-of-rack (TOR) switches, to further connect to all servers in this rack.

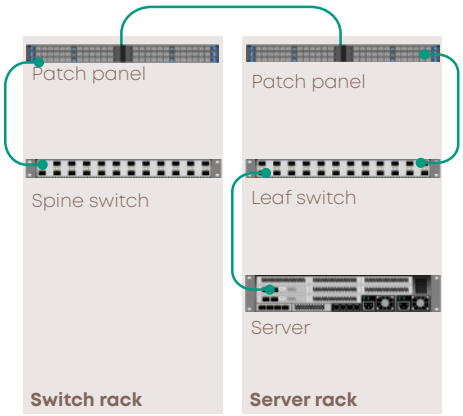
Network architecture



Logical connections without structured cabling



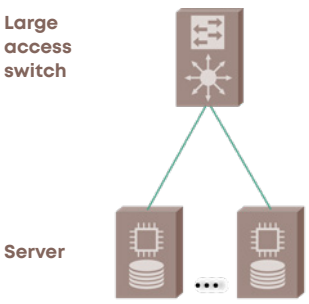
With structured cabling



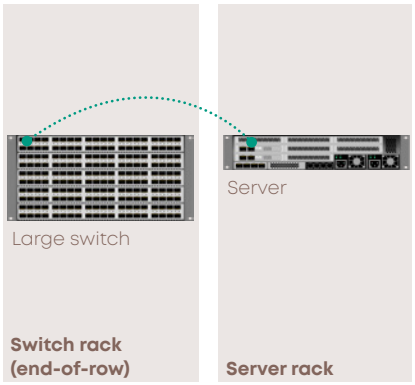
End-of-row architecture

In an end-of-row architecture, structured cabling provides the physical path for connections between a large access switch (end-of-row) in the switch rack and servers in server racks.

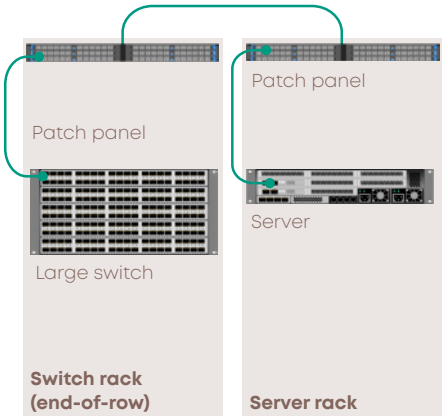
Network architecture



Logical connections without structured cabling



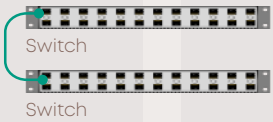
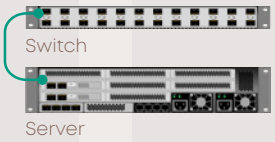
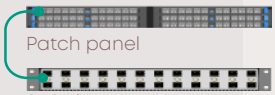
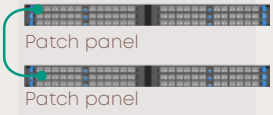
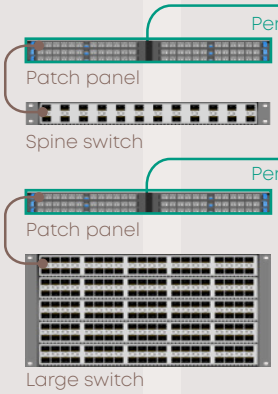
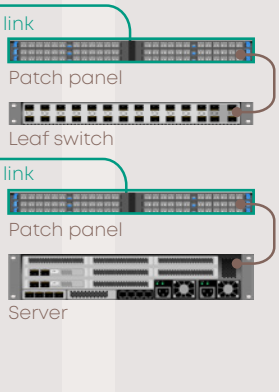
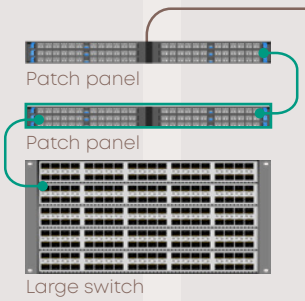
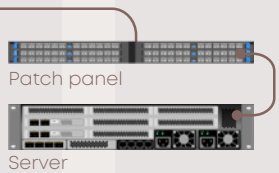
With structured cabling



Cabling scenarios

Our products allow you to set up your system in different cabling scenarios. Each scenario has its specific advantages. Depending on the scenario chosen, as well as the type of transceivers that you have in your system, you will need different products and solutions.

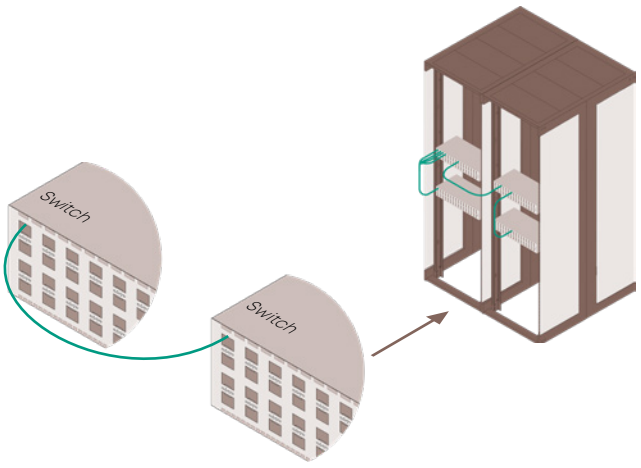
Types of transceiver connections

	Duplex to duplex	Parallel to duplex	Parallel to parallel
Direct-connect Apply this scenario for in-rack connections that connect end equipment to the panel or connect end equipment to end equipment.			
In-rack In-rack connections are equipment-to-panel or panel-to-panel (called cross-) connections.			
Inter-connect Apply this scenario for connections between equipment in distanced racks by adding permanent links. For example, to connect a spine switch with leaf switches or end-of-row switches with servers.			
Cross-connect Apply this scenario to add more flexibility to the inter-connect scenario by adding port extension to enhance cable management and security.			

Cabling scenarios

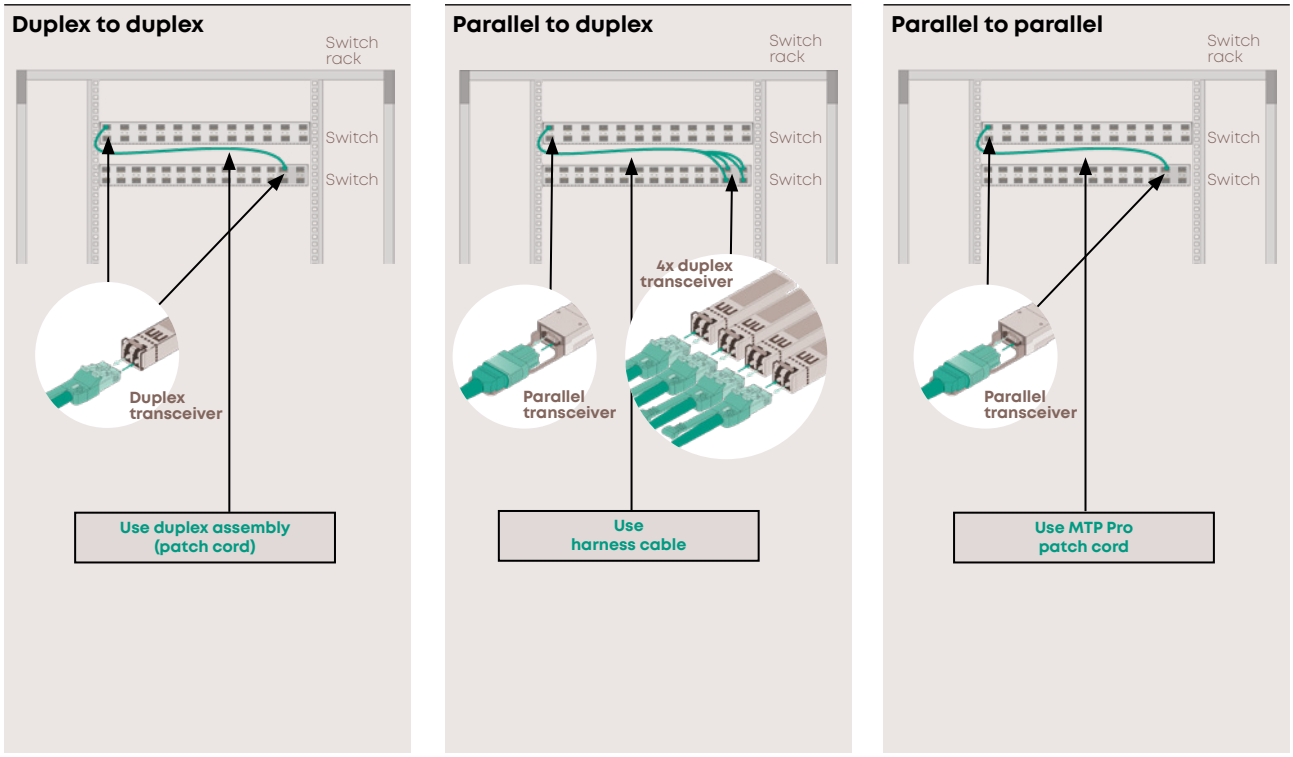
Direct-connect

Apply this scenario for connections between equipment within the same or adjacent racks. No patch panels are needed in this scenario.



Direct connection between equipment within the same or in adjacent racks

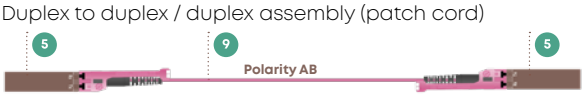
Direct-connect links for different types of transceivers



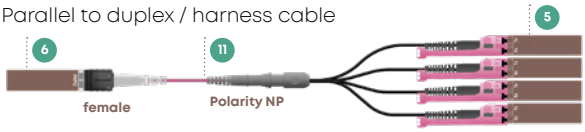
Typical product applications

Multimode fiber

Duplex to duplex / duplex assembly (patch cord)

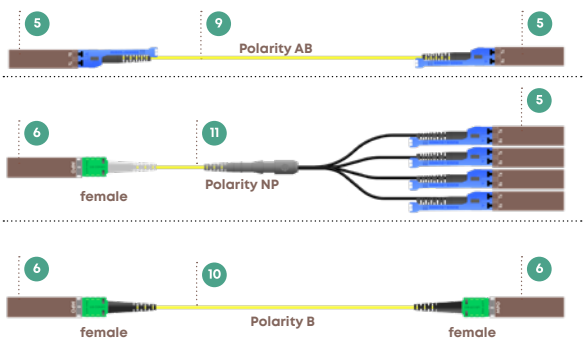


Parallel to duplex / harness cable



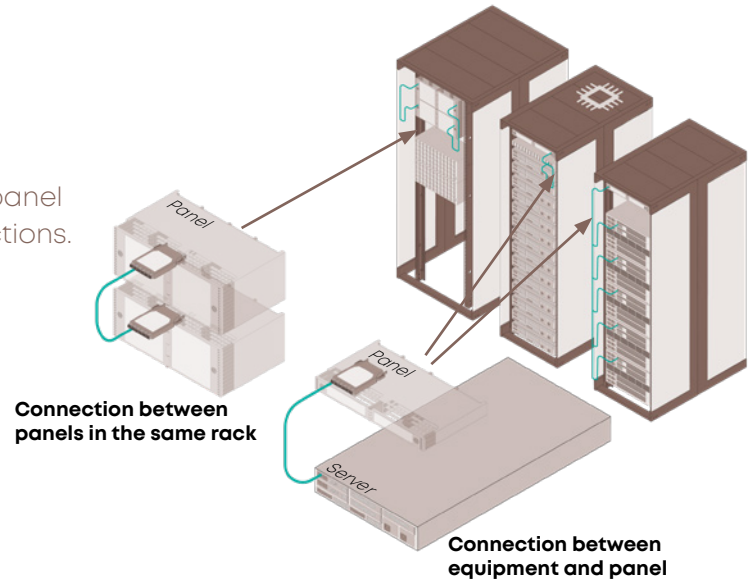
Parallel to parallel /MTP Pro patch cord

Singlemode fiber



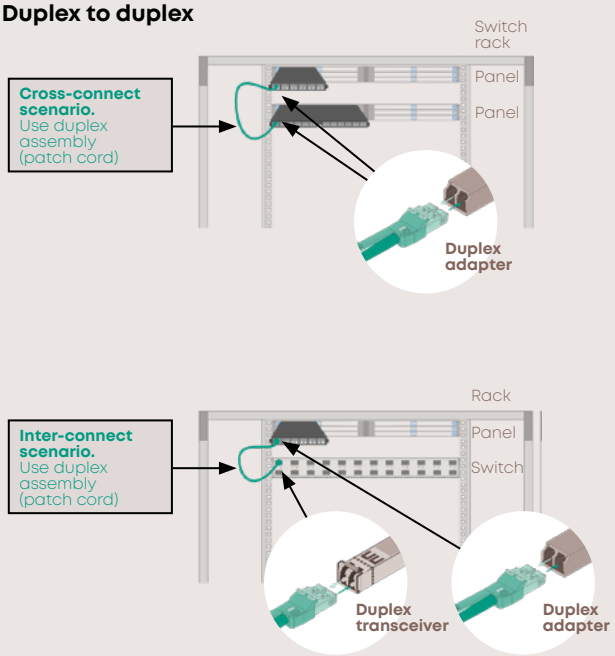
In-rack

In-rack connections are equipment-to-panel or panel-to-panel (called cross-) connections.

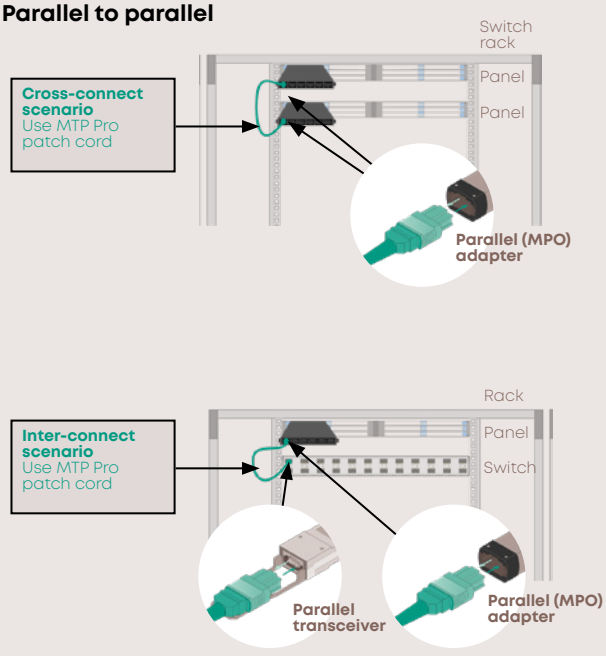


Types of in-rack connections

Duplex to duplex



Parallel to parallel



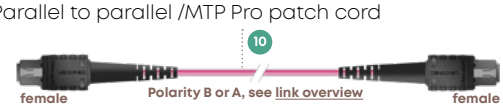
Typical product applications

Multimode fiber

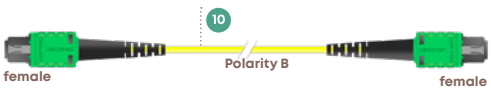
Duplex to duplex / duplex assembly (patch cord)

Harness cables are not advised for in-rack connections

Parallel to parallel /MTP Pro patch cord

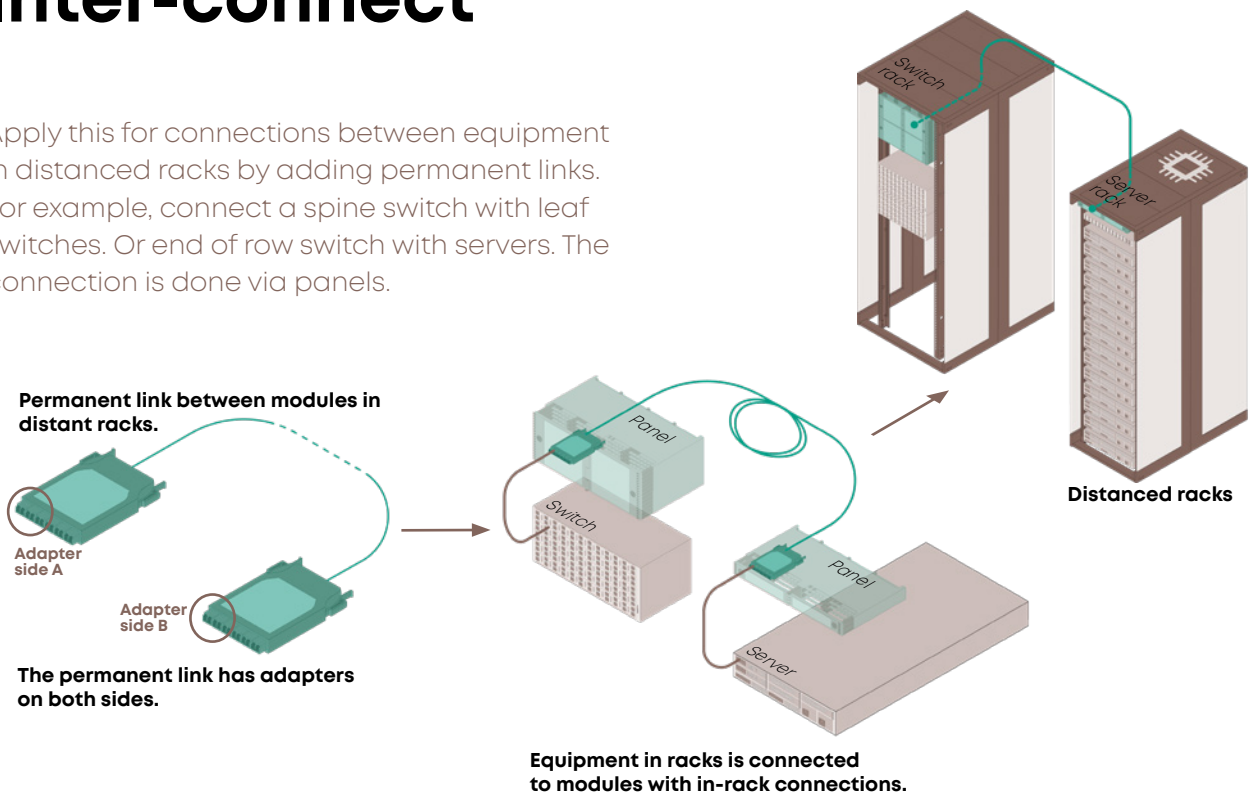


Singlemode fiber

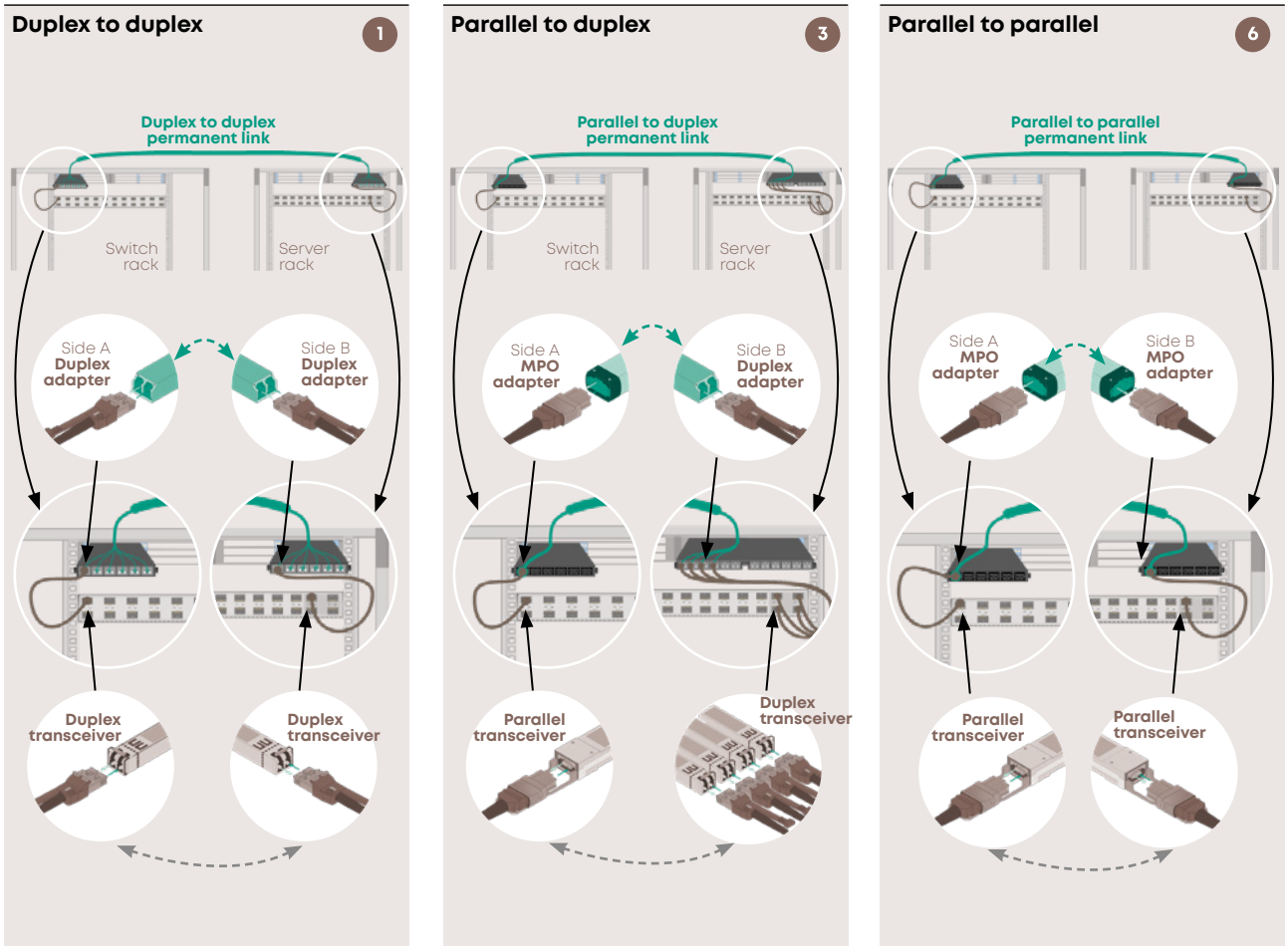


Inter-connect

Apply this for connections between equipment in distanced racks by adding permanent links. For example, connect a spine switch with leaf switches. Or end of row switch with servers. The connection is done via panels.



Permanent links for different types of transceivers

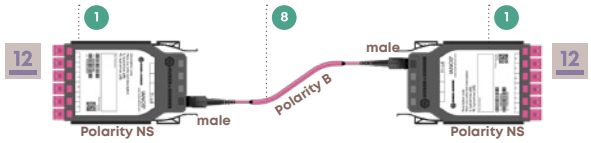


Typical product applications

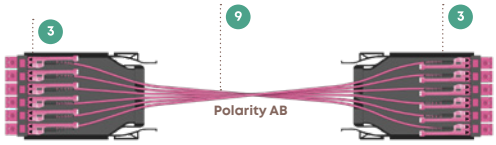
Multimode fiber

Duplex to duplex permanent links
Duplex adapter on both ends of permanent links
Three ways to build.

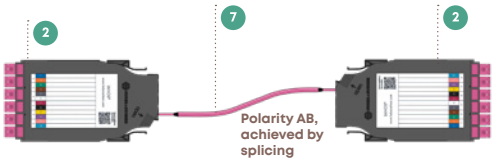
With transition modules - plug-and-go



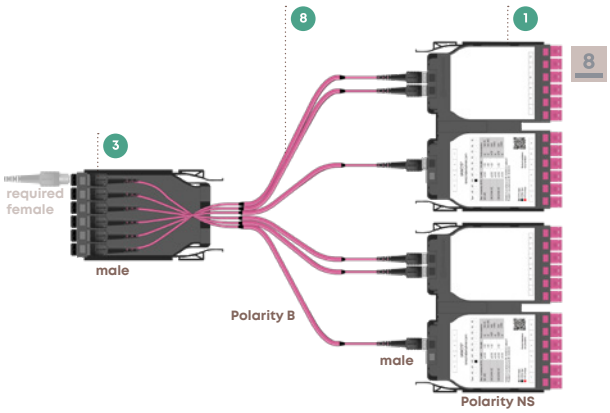
With patch modules - patch-and-go



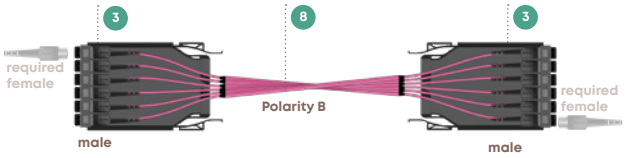
With splice modules - splice-and-go



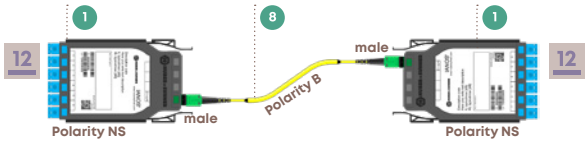
Parallel to duplex permanent links
MPO adapter at one end transitioned to duplex adapters on the other end of permanent links

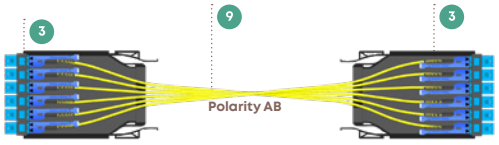


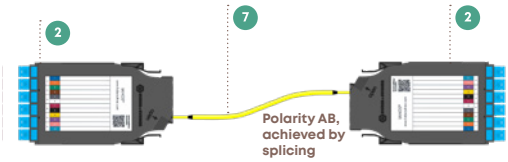
Parallel to parallel permanent links
Duplex adapter on both ends of permanent link

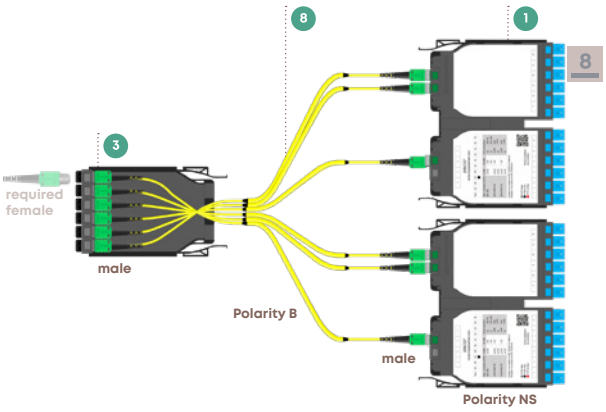


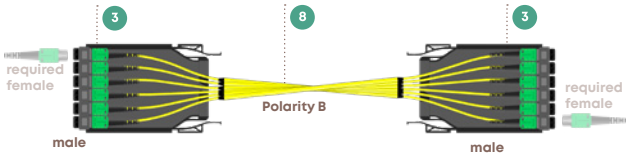
Singlemode fiber





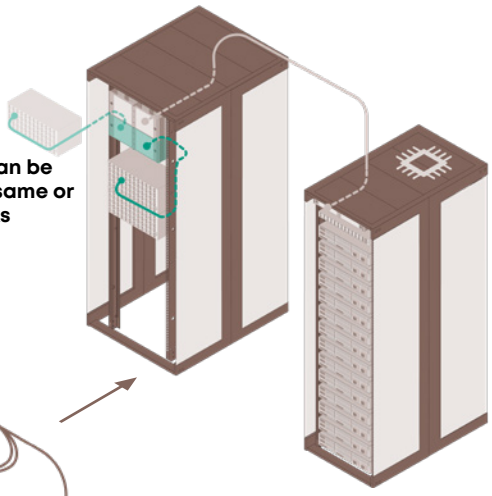




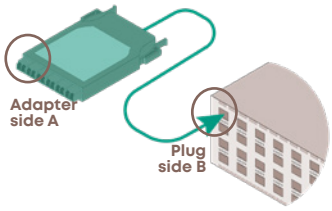


Cross-connect

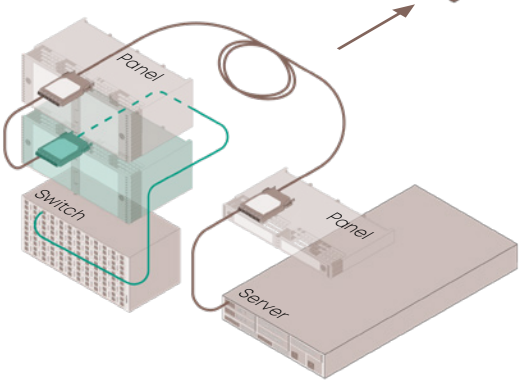
Apply this scenario for connections between equipment in distanced racks by adding port extensions. For example, to extend spine switch ports onto an extension panel to connect with leaf switches.



The switches can be located in the same or distanced racks



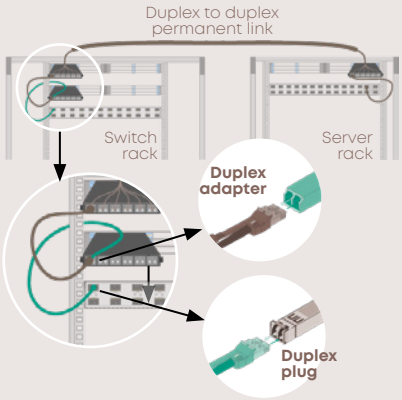
Switch ports are replicated onto a patch panel by port extension



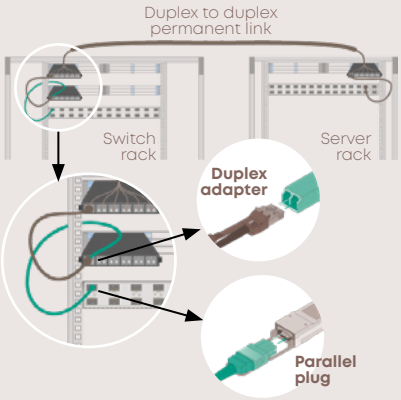
The patch panel is connected to other equipment via permanent lnks.

Port extension for different types of transceivers and permanent links

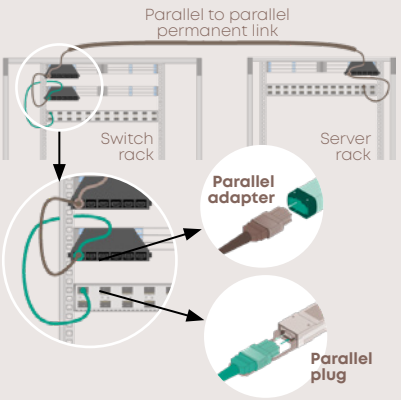
Duplex to duplex
duplex cross-connect
2



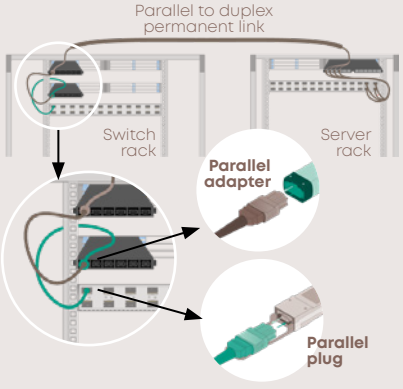
Parallel to duplex
duplex cross-connect
4



Parallel to parallel
MTP cross-connect
7



Parallel to duplex
MTP cross-connect
5

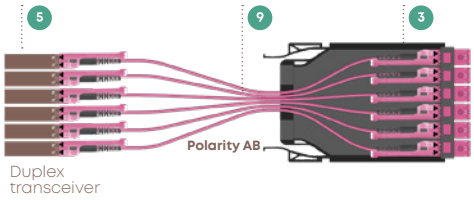


Typical product applications

Multimode fiber

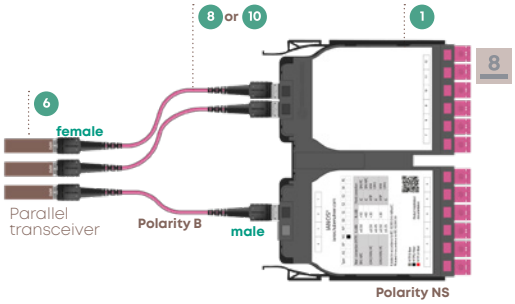
Duplex to duplex port extension

Duplex plug at one end and duplex adapter on the other end of the port extension link



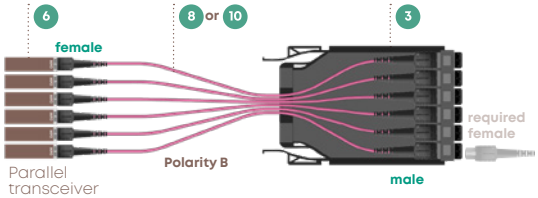
Parallel to duplex port extension

MPO plug at one end and duplex adapters on the other end of the port extension link

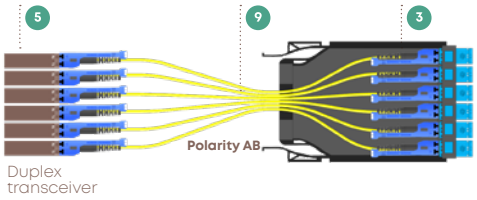


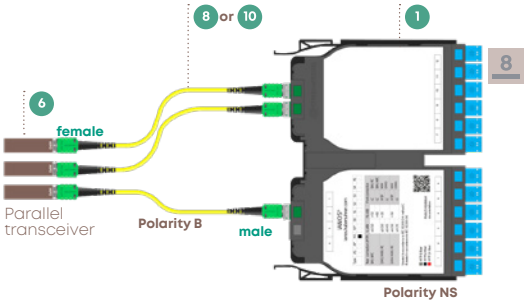
Parallel to parallel port extension

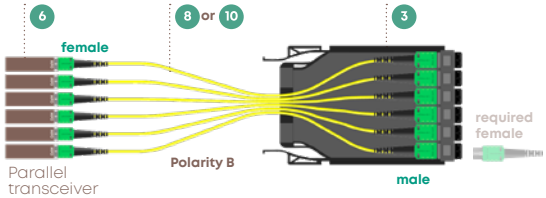
MPO plug at one end and MPO adapter on the other end of the port extension link



Singlemode fiber



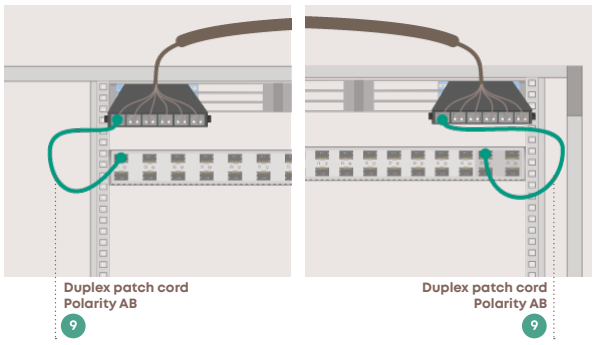




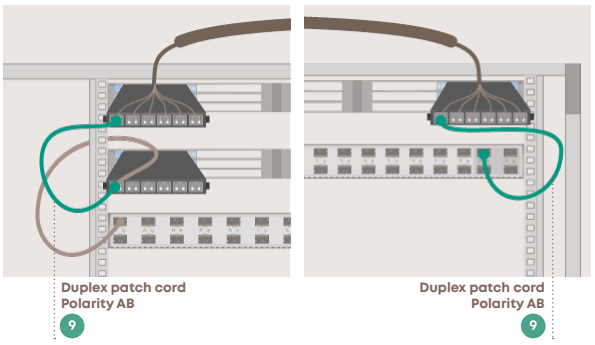
All link design configurations

Follow these full link configurations to verify required in-rack connection and alternate polarity of duplex or MTP Pro patch cords where necessary.

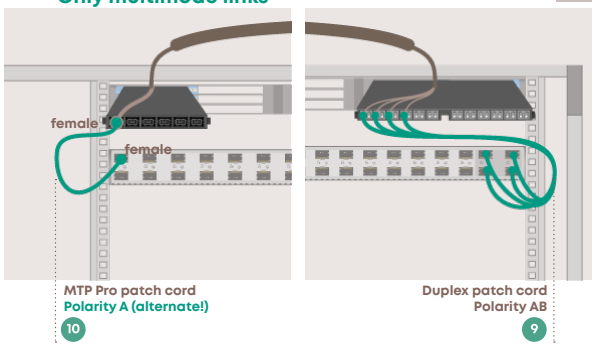
1 Duplex to duplex, inter-connect



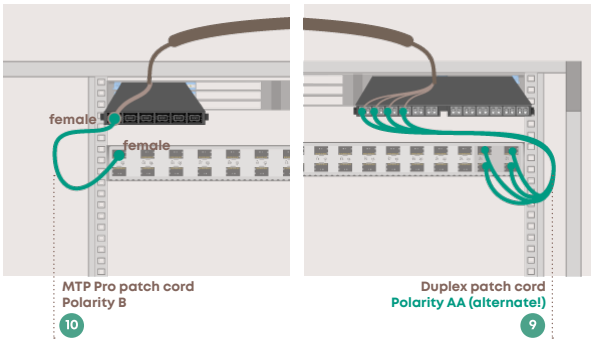
2 Duplex to duplex, duplex cross-connect



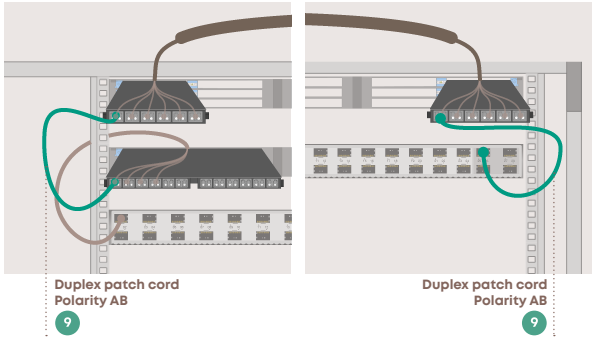
3a Parallel to duplex, inter-connect
Only multimode links



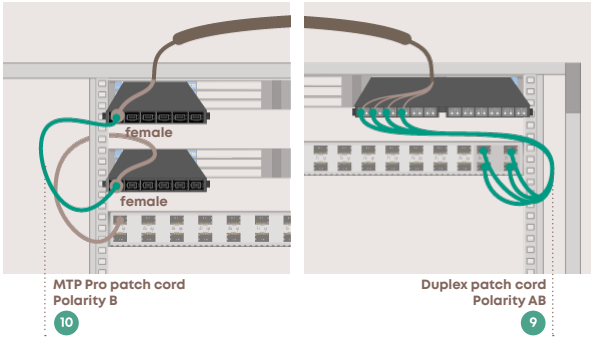
3b Parallel to duplex, inter-connect



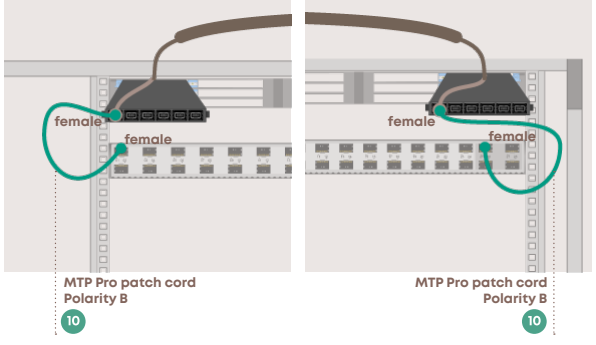
4 Parallel to duplex, duplex cross-connect



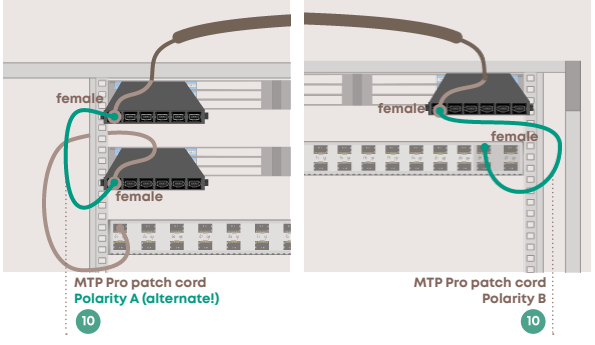
5 Parallel to duplex, MTP cross-connect



6 Parallel to parallel, inter-connect



7 Parallel to parallel, MTP cross-connect
Only multimode links

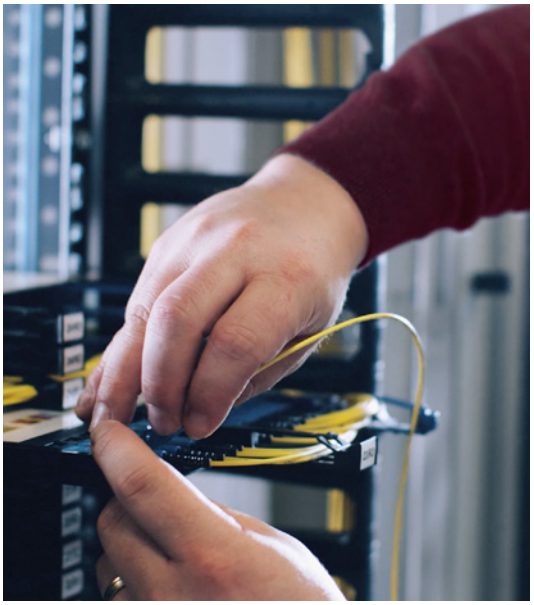


Contact

Local support

The HUBER+SUHNER white space portfolio is available through our global partner network. For more information please reach out to them directly by visiting the website below:

White space website



Structured cabling products for the white space

Modules and panels

- Transition modules
- Splice modules
- Patch modules
- Patch panels

→ Page 18

Transceivers

- Duplex transceivers
- Parallel transceivers

→ Page 26

Cables

- FO cables
- MTP Pro jumpers

→ Page 28

Patch cords

- Duplex assemblies
- MTP Pro patch cords
- Harness cables

→ Page 32

Tools

- MTP Pro tools
- Cleaning tools

→ Page 38

IANOS® transition module

IANOS transition modules are built using fiber optic assembly, which transitions the MTP female at the rear side inside of the module to the LC duplex on the front side. Transition modules are used to build various plug-and-play structured cabling permanent links.

Transition modules are available in single or double versions and can be of Base-8 or Base-12e methods. Base-8 transits 8 fibers. Base-12e transits all 12 fibers.

Modules are compatible with MTP-12 fiber jumpers of matching fiber type and require male MTP connector on the jumper side.

Applications

Base-12e modules 12

- Duplex to duplex permanent links, with transition modules - plug-and-go

Base-8 transition modules 8

- Parallel to duplex permanent links
- Parallel to duplex port extension

Features

- Fast tool-less snapping in to a chassis from front or rear
- Optical low-loss performance
- Compatible with any IANOS chassis
- Factory cleaned, tested

Single transition module Base-12e

Technical data		
Fiber assembly type	1x transition circuit Base-12e	
Type of fiber	E9/125A2, ITU-T G.657.A2	G50/125-OM4, ITU-T G.651.1 Bend-optimized
Number of fibers	12	
Front	6x LC UPC duplex (blue)	6x LC duplex (heather violet)
Rear	1x MPO adapter (type A: key up/key down), green body, with MTP-12 female connector. Adapter has black shroud.	1x MPO reversable adapter (default: type A, key up/key down), black body with MTP-12 female connector. Adapter has black shroud.
Opitcal loss	Max. 0.50 dB (for each fiber, both connectors included)	Max. 0.35 dB (for each fiber, both connectors included)
Return loss	Min. 50 dB (for each fiber, both connectors included)	Min. 30 dB (for each fiber, both connectors included)
Polarity	Universal polarity NS (Type U1 as per TIA-568.3-E)	
Ordering information	85099763 ITS-06-LCUD-01-12CF-SM-NS-00WW	85125715 ITS-06-LCMD-01-12AF-04-NS-00UU

Double transition module Base-12e

Technical data		
Fiber assembly type	2x transition circuits Base-12e	
Type of fiber	E9/125A2, ITU-T G.657.A2	G50/125-OM4, ITU-T G.651.1 Bend-optimized
Number of fibers	24	
Front	12x LC UPC duplex (blue)	12x LC duplex (heather violet)
Rear	2x MPO adapter (type A: key up/key down), green body, with MTP-12 female connector. Adapter has black shroud.	2x MPO reversable adapter (default: type A, key up/key down), black body with MTP-12 female connector. Adapter has black shroud.
Opitcal loss	Max. 0.50 dB (for each fiber, both connectors included)	Max. 0.35 dB (for each fiber, both connectors included)
Return loss	Min. 50 dB (for each fiber, both connectors included)	Min. 30 dB (for each fiber, both connectors included)
Polarity	Universal polarity NS (Type U1 as per TIA-568.3-E)	
Ordering information	85115154 ITD-12-LCUD-02-12CF-SM-NS-00WW	85115173 ITD-12-LCMD-02-12AF-04-NS-00UU

Double transition module Base-8

Technical data		
Fiber assembly type	3x transition circuits Base-8	
Type of fiber	E9/125A2, ITU-T G.657.A2	G50/125-OM4, ITU-T G.651.1 Bend-optimized
Number of fibers	24	
Front	12x LC UPC duplex (blue)	12x LC duplex (heather violet)
Rear	3x MPO adapter (type A: key up/key down), green body, with MTP-8 female connector. Adapter has grey shroud.	3x MPO reversable adapter (default: type A, key up/key down), black body with MTP-8 female connector. Adapter has grey shroud.
Insertion loss	Max. 0.50 dB (for each fiber, both connectors included)	Max. 0.35 dB (for each fiber, both connectors included)
Return loss	Min. 50 dB (for each fiber, both connectors included)	Min. 30 dB (for each fiber, both connectors included)
Polarity	Universal polarity NS (Type U1 as per TIA-568.3-E)	
Ordering information	85072956 ITD-12-LCUD-03-08CF-SM-NS-00WW	85072955 ITD-12-LCMD-03-08AF-04-NS-00UU

IANOS® splice module

IANOS splice modules are equipped with fiber pigtails that can be fusion spliced to fiber optic cables. The design of the splice module assures a minimum fiber bend radius and fast splicing, reduced coiling time and convenient storage of bare fibers inside modules.

Modules are available in single or double size, supporting up to 12 or 24 fibers respectively. Pigtails in modules are colour-coded according to TIA, supplied with heatshrink splice protectors, and DIN colour-coded support sandwich splice protectors.

Applications

- Duplex to duplex permanent links, with splice modules - splice-and-go

Features

- Fast tool-less snapping in to a chassis from front or rear
- Optical low-loss performance
- Lid with fiber identification
- Compatible with any IANOS chassis
- Quick incoming cable fixation
- Bending radius control throughout

Single splice modules

Technical data		
Type of fiber	E9/125, ITU-T G.652.D	G50/125-OM4, ITU-T G.651.1 Bend-optimized
Number of fibers	12 / includes one set of 12 coloured pigtails plugged according to the colour code	
Front	6x LC UPC duplex (blue)	6x LC duplex (heather violet)
Rear	Various cable entry options: · 1x Ø5 mm (protection tube), · 1x Ø3.6 mm, · 1x Ø3 mm, · **1x Ø2 mm (use with 12f cable),** · 1x up to Ø5 mm (free choice)	
Opitcal loss	Max. 0.30 dB per pigtail	Max. 0.15 dB per pigtail
Return loss	Min. 50 dB per pigtail	Min. 35 dB per pigtail
Colour code	TIA (code **04**) or DIN (code **02**)	
Splice protectors	· Heatshrink ø1.5x40 (in TIA module) - **H1** in the code, protectors included · Sandwich (in DIN module) - **S0** in the code, protectors are **not** included	
Ordering information TIA module	85115852 ISS-06-LCUD-00-0000-SM-04-H1S0	85115850 ISS-06-LCMD-00-0000-O4-04-H1L0
Ordering information DIN module	85141996 ISS-06-LCUD-00-0000-SM-02-S0S0	85141997 ISS-06-LCMD-00-0000-O4-02-S0L0

Double splice modules

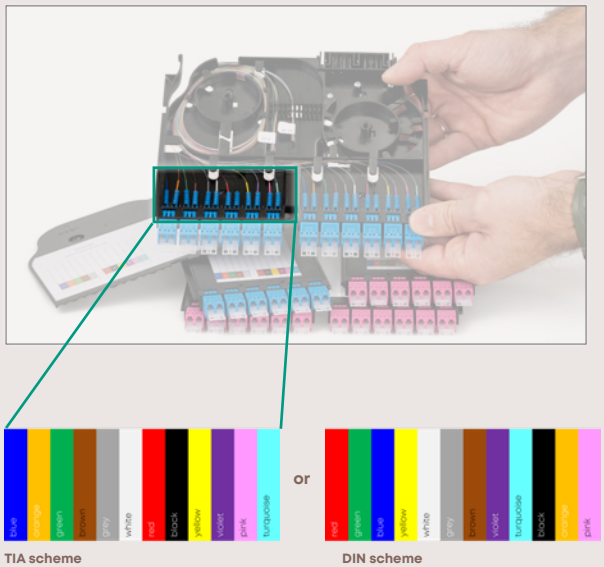
Technical data

Type of fiber	E9/125, ITU-T G.652.D	G50/125-OM4, ITU-T G.651.1 Bend-optimized
Number of fibers	24 / includes two sets of 12 coloured pigtails plugged according to the colour code	
Front	12x LC UPC duplex (blue)	12x LC duplex (heather violet)
Rear	Various cable entry options: · 2x Ø5 mm (protection tube), · 1x Ø3.6 mm, · **2x Ø3 mm (use with 24 fiber cable)** · **2x Ø2 mm (use with 12 or 48 fiber cable)**	
Opitcal loss	Max. 0.30 dB per pigtail	Max. 0.15 dB per pigtail
Return loss	Min. 50 dB per pigtail	Min. 35 dB per pigtail
Colour code	TIA (code **04**) or DIN (code **02**)	
Splice protectors	· Heatshrink ø1.5x40 (in TIA module) - **H1** in the code, protectors included · Sandwich (in DIN module) - **S0** in the code, protectors are **not** included	
Ordering information TIA module	85072934 ISD-12-LCUD-00-0000-SM-04-H1S0	85072937 ISD-12-LCMD-00-0000-04-04-H1L0
Ordering information DIN module	85140268 ISD-12-LCUD-00-0000-SM-02-S0S0	85140240 ISD-12-LCMD-00-0000-04-02-S0L0

Splice instructions

Pigtail colour codes

Pigtails inside splice module are inserted into LC duplex adapters according to colour code (schemes) - TIA or DIN.

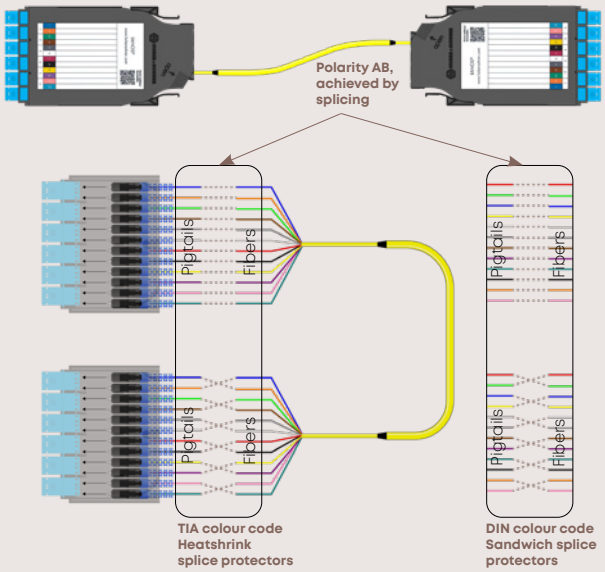


TIA scheme

DIN scheme

Achieving polarity AB

To achieve polarity AB, which is required for a duplex to duplex permanent link, one side of the cable should be spliced sequentially according to the colours, while on the other side, the fibers must be spliced by flipping each pair.



TIA colour code Heatshrink splice protectors

DIN colour code Sandwich splice protectors

IANOS® patch module

IANOS patch modules allow MTP and LC jumpers or patch cables to be connected directly to patch cords.

Duplex patching modules provide a fast plug-and-play alternative to transition or splice termination methods, and the MPO module is designed to support various application with parallel optics.

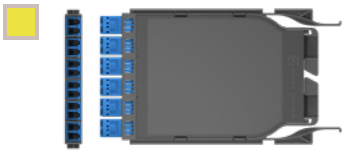
Applications

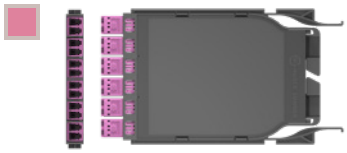
Duplex patch modules
- Duplex to duplex permanent link, with patch modules – patch-and-go
- Duplex to duplex port extension MPO patch modules
- Parallel to duplex permanent links
- Parallel to parallel permanent links
- Parallel to parallel port extension

Features

- Fast tool-less snapping in to a chassis from front or rear
- Lid for additional identification
- Compatible with any IANOS chassis

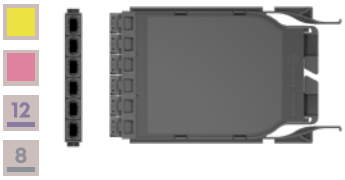
Duplex patch modules



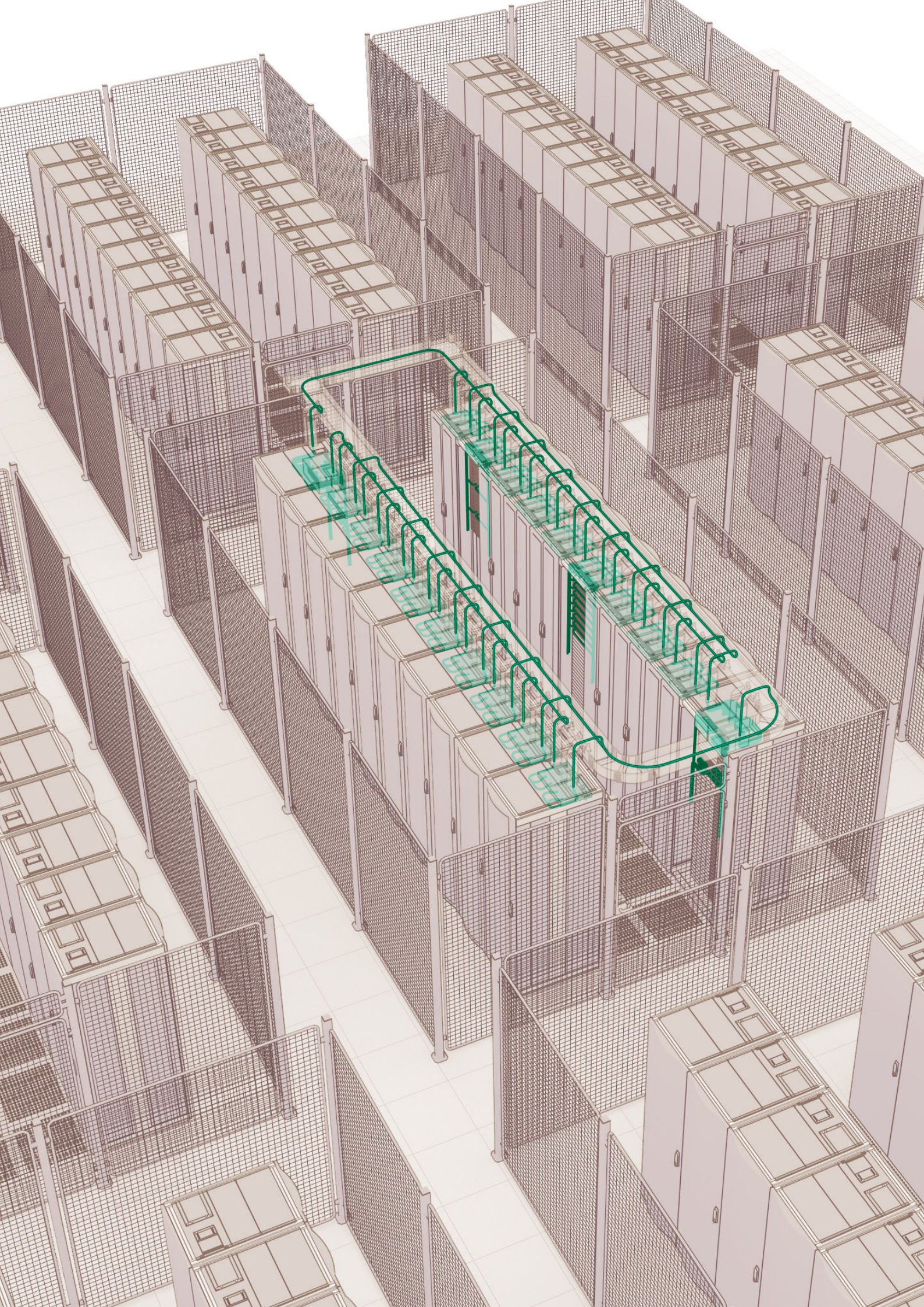


Technical data		
Front	6x LC UPC duplex (blue)	6x LC duplex (heather violet)
Ordering information	85072924 IPS-06-LCUD-00-0000-SM-00-0000	85073355 IPS-06-LCMD-00-0000-04-00-0000

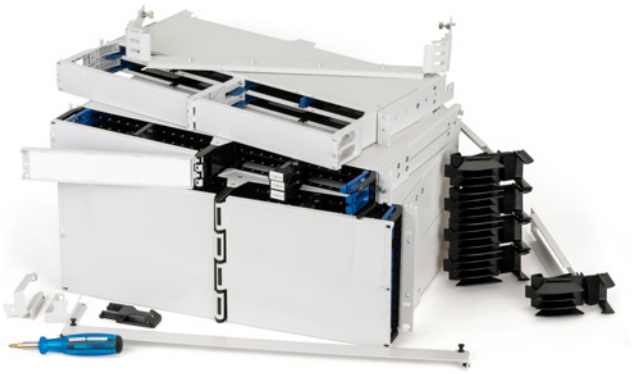
MPO patch modules



Technical data	
Front	6x MPO reversable adapters (suitable for both singlemode and multimode). Adapter has black shroud.
Ordering information	85116941 IPS-06-12AF-00-0000-00-00-0000

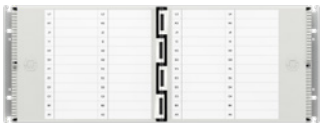


IANOS® chassis



The IANOS chassis accommodates various types of IANOS modules. There are two versions of chassis IANOS 1U and 4U for high-density applications with sliding layers, and IANOS 1U lite for applications where high-density is not required.

IANOS 4U are usually mounted in a network cabinet above a switch, while IANOS 1U and IANOS 1U lite are mounted on top of server cabinets.

	IANOS 1U	IANOS 4U	IANOS 1U lite
Front view with door			
Front view without door			
Top view			

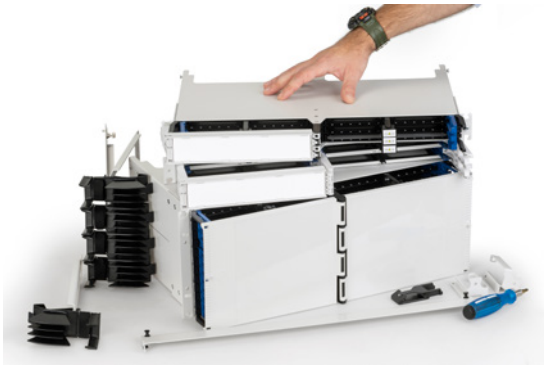
Technical data

Height, in rack units	1	4	1
Colour	telegrey 4 (RAL 7047)		
Max capacity of single modules	12	48	8
Max capacity of double modules	6	24	4
Maximum LC duplex or MPO port capacuty	72	288	48
Maximum single fiber capacity (using LC)	144	576	96
Design	Dual paths - Path A / Path B (left / right)		
Sliding layers	Three layers per 1U / sliding each layer left and right separately		Two layers fixed (no sliding)
Integrated door	Left / right door with labels		
Ordering information	85102690 IANOS-STD-CHASSIS-FLX-1U-2G-T4	85103010 IANOS-STD-CHASSIS-FLX-4U-2G-T4	85086220 IANOS-LITE-STANDARD-T4

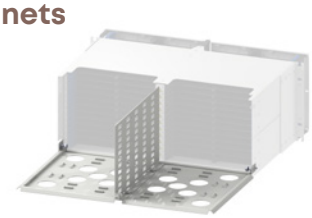
IANOS® accessories

IANOS accessories help address specific customer needs and complement the IANOS chassis offering.

Accessories include cable managers for various cabinets, layer clips required to alternate chassis design for "any path" configuration and retrofit doors for labelling if the layer clip used.



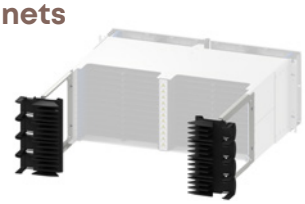
Rear cable managers for 600+ mm cabinets



Technical data

Application	Diverse paths of rear cables where sagging is not allowed		Single path / dual paths
Supported chassis	IANOS 1U	IANOS 4U	IANOS 1U IANOS 1U lite
Ordering information	85069473 IANOS-REAR-CABLE-MGR-1U-T4	85069474 IANOS-REAR-CABLE-MGR-4U-T4	85107331 IANOS-LITE-REAR-CAB-MGR-1U-T4

Rear cable managers for 750+ mm cabinets



Technical data

Application	Diverse paths of rear cables in cabinets with many incoming cables	
Supported chassis	IANOS 1U	IANOS 4U
Ordering information	85108771 IANOS-CABLE-MANAGER-REAR-1U	85108772 IANOS-CABLE-MANAGER-REAR-4U

Chassis design alternation accessories

Technical data

Application	Binds left and right layer to slide together - "any path" patching	Replaces integrated door / provides labelling in "any path" design
Supported chassis	IANOS 1U	
Ordering information	85069563 IANOS-LAYER-CLIP-BK	85181140 IANOS-LABEL-DOOR-1U-T4

Duplex transceivers

Transceivers can be used in various equipment as soon as the form factors of the network card or switch receptacle are compatible with the transceiver's form factors and coding.

Listed below are the most popular Ethernet transceivers examples with LC duplex interface which are used in the white space.

Structured cabling scenarios and the possibility for future speed upgrades depend on the transceiver's interface.

SFP+ 10G SR

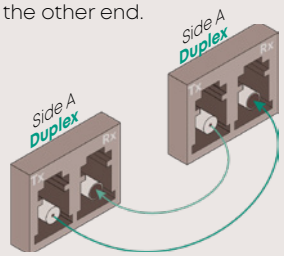
SFP28 25G SR

SFP28 25G LR

Technical data			
Data rate	10G	25G	
Form factor	SFP+	SFP28	
Distance	300 m	100 m	2 km
Wavelength	850 nm		1310 nm
Fiber type	Multimode (OM4)		Singlemode (OS2)
Temperature range	0…+70°C		
Power budget	6 dB	7 dB	5.6 dB
Modulation and FEC	NRZ		
Physical interface	LC PC duplex		LC UPC duplex
Order information, Cisco coding	CSM-900A06DC-85	CSM-400A07DC-85	CSS-420A06DC-13
Order information, Juniper coding	CSM-900A06DJ-85	CSM-400A07DJ-85	CSS-420A06DJ-13

Duplex transceiver's lane assignment

Structured cabling scenarios must assure that Tx and Rx of duplex transceivers on one end are connected to Tx and Rx on the other end.



Side A	Side B
Tx A	Rx B
Rx A	Tx B

Lane

QSFP28 100G CWDM4

QSFP-DD 400G FR4

Technical data		
Data rate	100G	400G
Form factor	QSFP28	QSFP-DD
Distance	2 km	
Wavelength	mux / demux: 1271 nm, 1291 nm, 1311 nm, 1331 nm	
Fiber type	Singlemode (OS2)	
Temperature range	0…+70°C	0…+70°C
Power budget	>5 dB	4 dB
Modulation and FEC	PAM4	
Physical interface	LC UPC duplex	
Order information, Cisco coding	CQS-901A05DC-13	CQS-100A04DC-13
Order information, Cisco coding	CQS-901A05DJ-13	CQS-100A04DJ-13

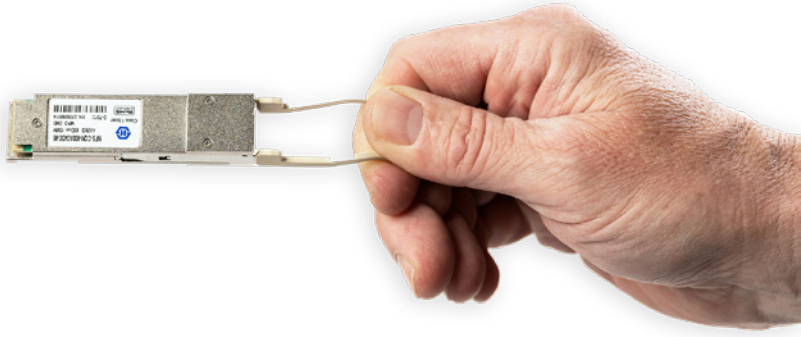
Click to see more transceivers

Transceiver selector

Parallel transceivers

Listed below are the most popular Ethernet transceiver examples with parallel MPO interface which are used in the white space.

All parallel transceivers support breakout, which means they can be connected to discrete serial transceivers, which increase switch port capacity. Structured cabling scenarios support breakout of transceivers in different ways.



QSFP+ 40G SR4

QSFP28 100G SR4

Technical data

Data rate	40G	100G
Form factor	QSFP+	QSFP28
Distance	150 m	
Wavelength	850 nm	
Fiber type	Multimode (OM4)	
Temperature range	0…+70°C	
Parallel mode	4x 10G SR	4x 25G SR
Power budget	2 dB	2 dB
Modulation and FEC	NRZ	
Physical interface	MPO flat polished 8- or 12- fiber connector	
Order information, Cisco coding	CQM-800A04DC-85	CQM-900A04DC-85
Order information, Juniper coding	CQM-800A04DJ-85	CQM-900A04DJ-85

QSFP28 100G PSM4

QSFP-DD 400G DR4

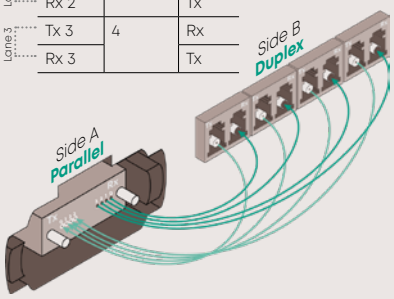
Technical data

Data rate	100G	400G
Form factor	QSFP28	QSFP-DD
Distance	2 km	500 m
Wavelength	1310 nm	
Fiber type	Singlemode (OS2)	
Temperature range	0…+70°C	
Parallel mode	4x 25G LR	4x 100G DR
Power budget	4 dB	3 dB
Modulation and FEC	PAM4	
Physical interface	MPO 8° angled polished 8- or 12- fiber connector	
Order information, Cisco coding	CQS-906A04DC-13	CQS-102A03DC-13
Order information, Juniper coding	CQS-906A04DJ-13	CQS-102A03DJ-13

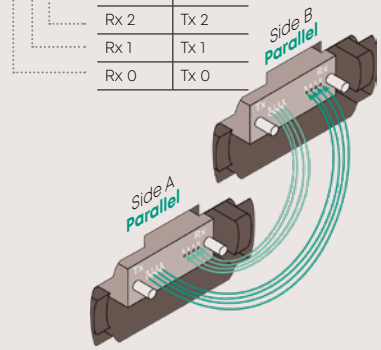
Parallel transceiver's lane assignment

Structured cabling scenarios must assure that Tx and Rx of transceivers on one end are connected to the Tx and Rx on the other end.

	Side A	Side B	
		Transceiver	Tx/Rx
Lane 0	Tx 0	1	Rx
	Rx 0		Tx
Lane 1	Tx 1	2	Rx
	Rx 1		Tx
Lane 2	Tx 2	3	Rx
	Rx 2		Tx
Lane 3	Tx 3	4	Rx
	Rx 3		Tx



Side A	Side B
Tx 0	Rx 0
Tx 1	Rx 1
Tx 2	Rx 2
Tx 3	Rx 3
Rx 3	Tx 3
Rx 2	Tx 2
Rx 1	Tx 1
Rx 0	Tx 0



Fiber optic cables

Optipack cables are specially designed for data center structured cabling applications. They are small, flexible, but fire and crush resistant. They are convenient for fusion splice. IANOS splicing modules allow easy termination of cables with no extra fixing accessories. Cables allow easy stripping and outer jacket removal for in-rack cabling.

The white space portfolio includes two cable types: double jacket trunk cable (12 or 24 fiber) that are used together with single or double IANOS modules to build 6- or 12- port duplex links between cabinets. A 48 fiber cable can be used with both single and double modules to deploy 24 duplex port links.

Applications

- Duplex to duplex permanent links, with splicing modules – splice-and-go

Features

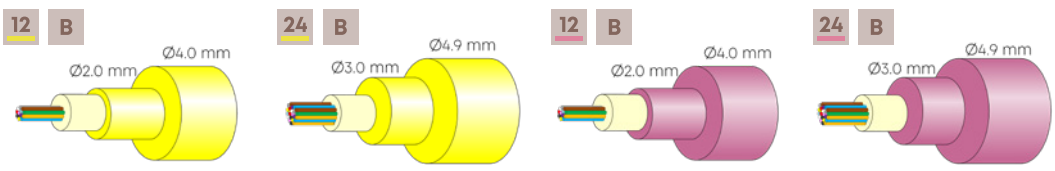
- Metal-free indoor cable, strain relieved with aramid yarns
- Tight bending radii
- Tested, verified and compliant to standards
- Optimised outer-diameter construction
- Cut at place, no cable slack issues
- Compliant to CPR

Optical characteristics of fiber

Technical data

Type of fiber	E9/125A2, ITU G.657.A2				G50/125-OM4, ITU G.651 Bend-optimized			
At wavelength	1310 nm		1550 nm		850 nm		1300 nm	
Attenuation in cable, optical loss	Typical	Maximum	Typical	Maximum	Typical	Maximum	Typical	Maximum
	0.35 dB	0.40 dB	0.21 dB	0.25 dB	2.3 dB	2.7 dB	0.5 dB	1.0 dB

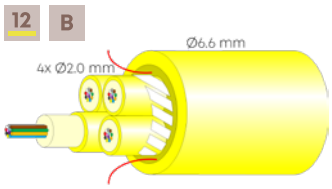
Optipack double jacket trunk cable, 12 and 24 fiber

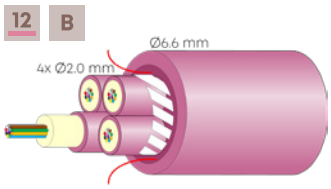


Technical data

Type of fiber	E9/125A2, ITU G.657.A2		G50/125-OM4, ITU G.651 Bend-optimized	
Number of fibers	12	24	12	24
Inner jacket diameter	2 mm	3 mm	2 mm	3 mm
Outer jacket diameter	4 mm	4.9 mm	4 mm	4.9 mm
Cable jacket	Yellow, LSFH		Heather violet, LSFH	
CPR	B2ca-s1a,d0,a1			
Ordering information	85137705 12-E9A2/(ZN)HH-E20#B	85102544 24-E9A2/(ZN)HH-E30#B	85120659 12-G50/(ZN)HH-L20-G#B	85103329 24-G50/(ZN)HH-L30-G#B

Optipack double jacket trunk cable, 12 and 24 fiber





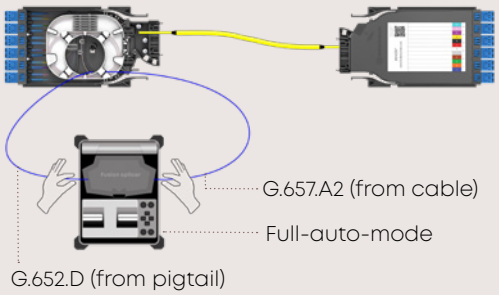
Technical data

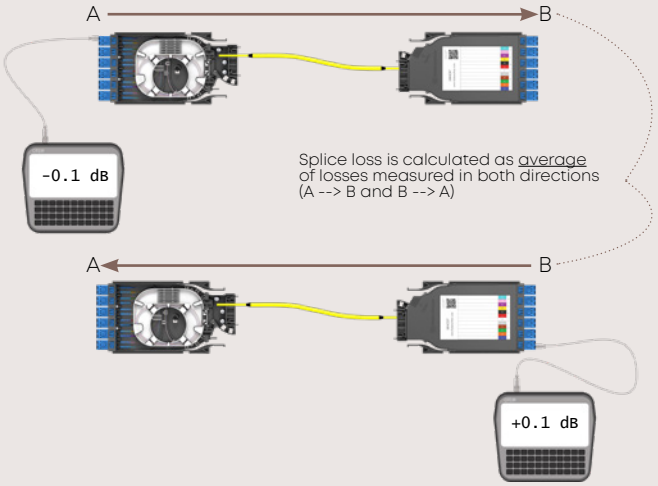
Type of fiber	E9/125A2, ITU G.657.A2	G50/125-OM4, ITU G.651 Bend-optimized
Number of fibers	48 (4x12)	
Inner jacket diameter	2 mm	
Outer jacket diameter	6.6 mm	
Cable jacket	Yellow, LSFH	Heather violet, LSFH
CPR	B2ca-s1a,d0,a1	
Ordering information	85089314 48-12E9A2/(ZN)SNH-E20#B	85092256 48-12G50/(ZN)SNH-L20-G#B

Splicing G.652.D and G.657.A2

Splicing fiber G.652.D to G.657.A2 is a typical routine.
To perform it, make sure that:

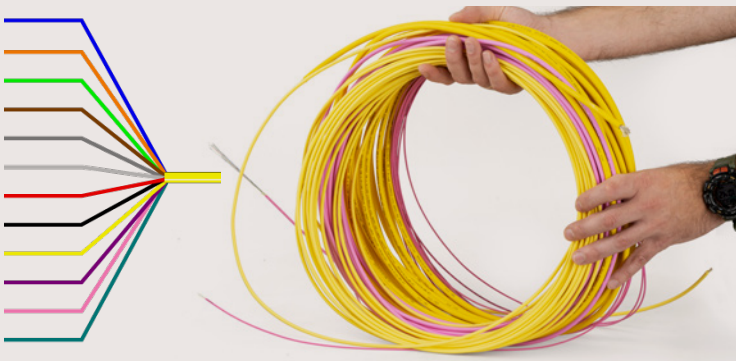
1. Fusion splicer is set to full-auto-mode
2. Perform bi-directional OTDR testing (if OTDR testing method used)



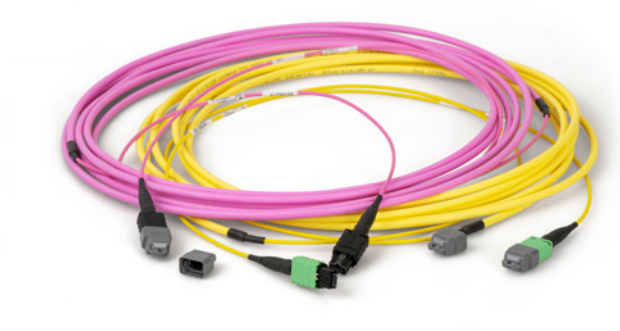


Fiber colours

Cables contain coloured fibers which can be used in any splice scenarios – TIA or DIN



MTP Pro jumpers



MTP Pro jumpers are 12 fiber Optipack double jacketed cables terminated with MTP Pro male connectors on both sides. MTP Pro jumpers are used to connect MTP to LC transition modules, patch modules or can be used to directly connect equipment in distanced racks.

The MTP Pro connector allows for gender and polarity change which is used in structured cabling scenarios. For example, jumper (male to male) can be turned into patch cord (female to female).

Applications

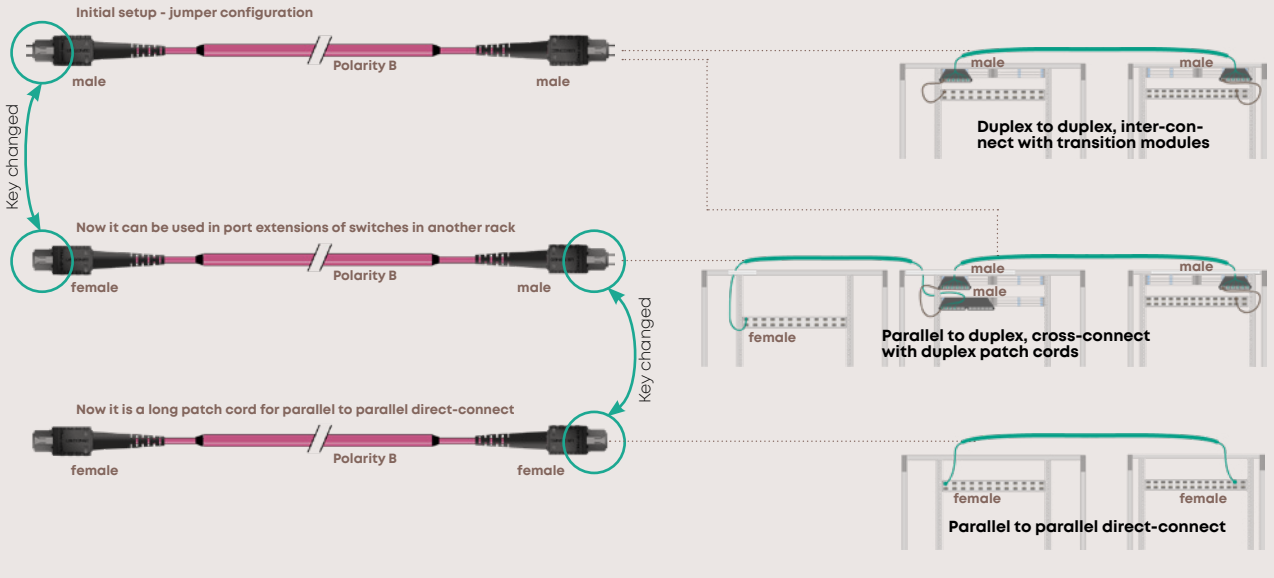
- Duplex to duplex permanent links, with transition modules - plug-and-go
- Parallel to duplex permanent links

Features

- Polarity and gender alteration (polarity change only on multimode)
- Optimised outer-diameter construction for outside rack cabling
- Compliant to CPR B2ca
- Base-8 or Base-12e compatible

MTP Pro jumper alterations - from jumper to patch cord

MTP assembly can be changed from “jumper” to “patch cord” configuration.



MTP Pro jumpers

Technical data

Fiber type	E9/125A2, ITU G.657.A2	G50/125-OM4, ITU G.651 Bend-optimized
Cable type	Optipack double jacket trunk cable, 12 fiber, 4 mm outer and 2 mm inner diameter	
CPR	B2ca-s1a,d0,a1	
Polarity	B	B (convertible to A)
Connector side A	MTP Pro male (convertible to female)	
Connector side B	MTP Pro male (convertible to female)	
Optical loss, per connector	0.1 dB / 0.35 dB (mean / max)	
Return loss, per connector	Min. 60 dB (for each fiber, both connectors included)	Min. 30 dB (for each fiber, both connectors included)

Ordering information

Length, m	Length, ft	Item number	Description code
5	17'	85166291	MB12_MPAM_MPAM_A240y_05.0_BB
7	23'	85184251	MB12_MPAM_MPAM_A240y_07.0_BB
10	33'	85166292	MB12_MPAM_MPAM_A240y_10.0_BB
12	40'	85184252	MB12_MPAM_MPAM_A240y_12.0_BB
15	50'	85166293	MB12_MPAM_MPAM_A240y_15.0_BB
17	56'	85184253	MB12_MPAM_MPAM_A240y_17.0_BB
20	66'	85166294	MB12_MPAM_MPAM_A240y_20.0_BB
22	73'	85184254	MB12_MPAM_MPAM_A240y_22.0_BB
25	83'	85166295	MB12_MPAM_MPAM_A240y_25.0_BB
27	89'	85184255	MB12_MPAM_MPAM_A240y_27.0_BB
30	99'	85166296	MB12_MPAM_MPAM_A240y_30.0_BB
32	105'	85184256	MB12_MPAM_MPAM_A240y_32.0_BB
35	115'	85166297	MB12_MPAM_MPAM_A240y_35.0_BB
37	122'	85184257	MB12_MPAM_MPAM_A240y_37.0_BB
40	132'	85166298	MB12_MPAM_MPAM_A240y_40.0_BB
42	138'	85184258	MB12_MPAM_MPAM_A240y_42.0_BB
45	148'	85184309	MB12_MPAM_MPAM_A240y_45.0_BB
47	155'	85184310	MB12_MPAM_MPAM_A240y_47.0_BB
50	165'	85166299	MB12_MPAM_MPAM_A240y_50.0_BB
60	197'	85166300	MB12_MPAM_MPAM_A240y_60.0_BB
70	230'	85166301	MB12_MPAM_MPAM_A240y_70.0_BB
80	263'	85166302	MB12_MPAM_MPAM_A240y_80.0_BB
90	296'	85166303	MB12_MPAM_MPAM_A240y_90.0_BB
100	329'	85166304	MB12_MPAM_MPAM_A240y_0100_BB

Length, m	Length, ft	Item number	Description code
5	17'	85166275	MB12_MPMM_MPMM_0440y_05.0_LL
7	23'	85166280	MB12_MPMM_MPMM_0440y_07.0_LL
10	33'	85166281	MB12_MPMM_MPMM_0440y_10.0_LL
12	40'	85166282	MB12_MPMM_MPMM_0440y_12.0_LL
15	50'	85166283	MB12_MPMM_MPMM_0440y_15.0_LL
17	56'	85179962	MB12_MPMM_MPMM_0440y_17.0_LL
20	66'	85166284	MB12_MPMM_MPMM_0440y_20.0_LL
22	73'	85184366	MB12_MPMM_MPMM_0440y_22.0_LL
25	83'	85166285	MB12_MPMM_MPMM_0440y_25.0_LL
27	89'	85184367	MB12_MPMM_MPMM_0440y_27.0_LL
30	99'	85166286	MB12_MPMM_MPMM_0440y_30.0_LL
32	105'	85184368	MB12_MPMM_MPMM_0440y_32.0_LL
35	115'	85166287	MB12_MPMM_MPMM_0440y_35.0_LL
37	122'	85184369	MB12_MPMM_MPMM_0440y_37.0_LL
40	132'	85166288	MB12_MPMM_MPMM_0440y_40.0_LL
42	138'	85184370	MB12_MPMM_MPMM_0440y_42.0_LL
45	148'	85166289	MB12_MPMM_MPMM_0440y_45.0_LL
47	155'	85184385	MB12_MPMM_MPMM_0440y_47.0_LL
50	165'	85166290	MB12_MPMM_MPMM_0440y_50.0_LL

Duplex assemblies

Duplex assemblies, also called duplex patch cords, are 2-fiber cables terminated with LC duplex connectors on both sides. In the last five years LC has become the most popular connector in the world, especially in the white space.

The LC-XD connector is a HUBER+SUHNER patented connector that sets new standards for packing density and handling. It allows for adding and removing patch cords in a dense environment.

Applications

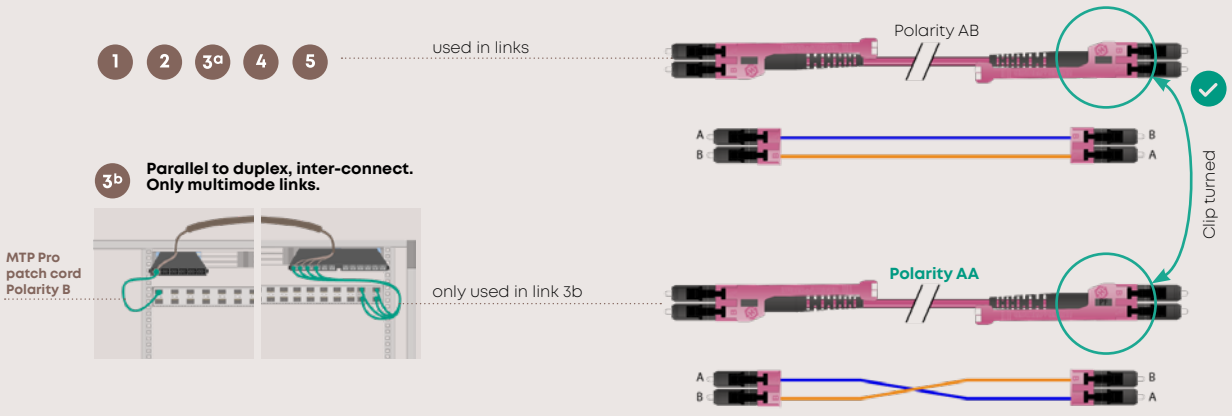
- Duplex to duplex direct-connect
- Duplex to duplex in-rack, inter-connect or cross-connect
- Duplex to duplex permanent link, with patch modules - patch-and-go
- Duplex to duplex port extension

Features

- Polarity flipping without tool
- Reduced cable diameters
- Push-pull mechanism, pulling antigrip tab
- Labelling possibility

Duplex assembly alteration

Changing the polarity – for in-rack connections
The polarity of a patch cord can be changed from default AB to AA. To do that, one LC-XD connector at one end needs to be changed.



LC-XD labelling clip

Use the LC-XD clip to place a sticker which can contain:
- the service ID of the patch cord, so that it can be found in the database
- the far end identification
- QR code

Duplex assemblies LC-XD to LC-XD

Technical data

Fiber type	E9/125A2, ITU G.657.A2	G50/125-OM4, ITU G.651 Bend-optimized
Cable type	Duplex round cable, 2.1mm, tight buffered tubes 0.6 mm, LSFH	
CPR	Dca-s1a,d0,a1	
Polarity	A-B/B-A (convertable to A-A/B-B)	
Connector side A	LC-XD UPC duplex	LC-XD duplex
Connector side B	LC-XD UPC duplex	LC-XD duplex
Optical loss, per connector	0.2 dB / 0.45 dB (mean / max)	0.3 dB (max)
Return loss, per connector	Min. 50 dB	Min. 35 dB

Ordering information

Length, m	Length, ft	Item number	Description code
1	4'	85016597	PCRS_LCUX_LCUX_A221T_01.0_SS
2	7'	85016599	PCRS_LCUX_LCUX_A221T_02.0_SS
3	10'	85016600	PCRS_LCUX_LCUX_A221T_03.0_SS
3.5	12'	85020818	PCRS_LCUX_LCUX_A221T_03.5_SS
4	14'	85019951	PCRS_LCUX_LCUX_A221T_04.0_SS
5	17'	85016601	PCRS_LCUX_LCUX_A221T_05.0_SS
7	23'	85020820	PCRS_LCUX_LCUX_A221T_07.0_SS
10	33'	85016602	PCRS_LCUX_LCUX_A221T_10.0_SS
12	40'	85085713	PCRS_LCUX_LCUX_A221T_12.0_SS
15	50'	85020821	PCRS_LCUX_LCUX_A221T_15.0_SS
17	56'	85144374	PCRS_LCUX_LCUX_A221T_17.0_SS
20	66'	85020822	PCRS_LCUX_LCUX_A221T_20.0_SS
25	83'	85025976	PCRS_LCUX_LCUX_A221T_25.0_SS
30	99'	85025977	PCRS_LCUX_LCUX_A221T_30.0_SS

Length, m	Length, ft	Item number	Description code
1	4'	85011862	PCRS_LCMX_LCMX_0421T_01.0_LL
2	7'	85019837	PCRS_LCMX_LCMX_0421T_02.0_LL
3	10'	85019838	PCRS_LCMX_LCMX_0421T_03.0_LL
3.5	12'	85021394	PCRS_LCMX_LCMX_0421T_03.5_LL
4	14'	85019950	PCRS_LCMX_LCMX_0421T_04.0_LL
5	17'	85019839	PCRS_LCMX_LCMX_0421T_05.0_LL
7	23'	85021396	PCRS_LCMX_LCMX_0421T_07.0_LL
10	33'	85019840	PCRS_LCMX_LCMX_0421T_10.0_LL
12	40'	85126556	PCRS_LCMX_LCMX_0421T_12.0_LL
15	50'	85021397	PCRS_LCMX_LCMX_0421T_15.0_LL
17	56'	85153272	PCRS_LCMX_LCMX_0421T_17.0_LL
20	66'	85021398	PCRS_LCMX_LCMX_0421T_20.0_LL
25	83'	85025988	PCRS_LCMX_LCMX_0421T_25.0_LL
30	99'	85025989	PCRS_LCMX_LCMX_0421T_30.0_LL

LC-XD labelling clip

Technical data

Colour	Transparent
Packing unit	1000 pcs in bag (per p/n)
Ordering information	85141483 FLC-LAB-CLP-XD_1000-P

MTP Pro patch cords

MTP Pro patch cords are 12 fiber Optipack single jacketed cables terminated with MTP Pro female connectors on both sides. MTP Pro patch cords are supposed to be used inside racks and cabinets.

The MTP Pro connector allow for gender and polarity change which is used in some structured cabling scenarios. For example, the gender can be changed on one side to allow for a port extension application.

Applications

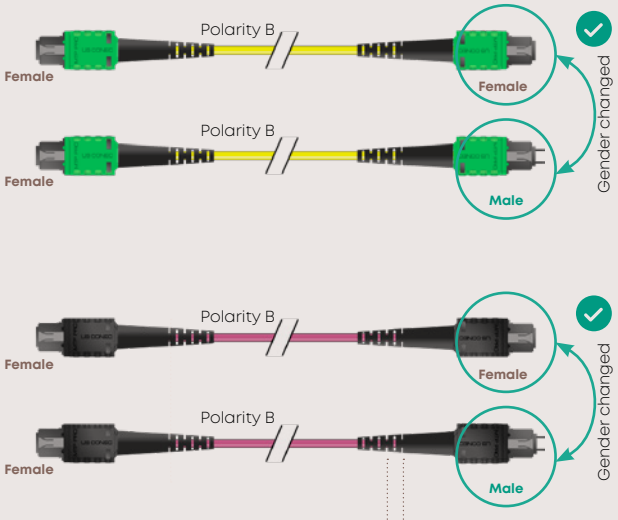
- Parallel to parallel direct-connect
- Parallel to parallel or parallel to duplex in-rack, inter-connect or cross-connect
- MPO adapter to MPO adapter cross-connect
- Parallel to duplex port extension
- Parallel to parallel port extension

Features

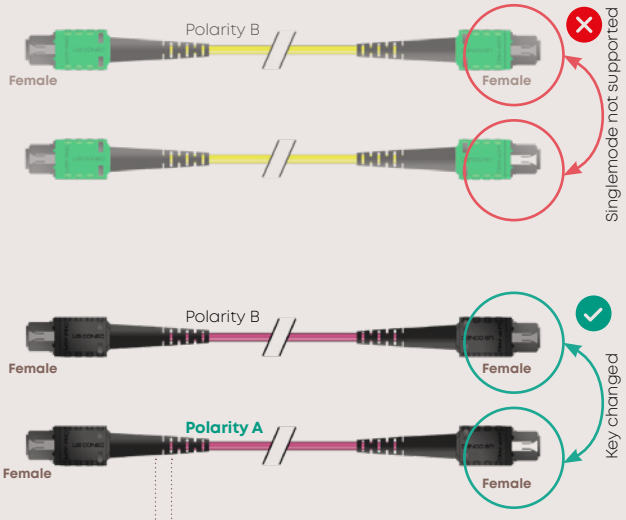
- Polarity and gender alteration
- Reduced cable diameters for in-rack cabling
- Base-8 or Base-12e compatible

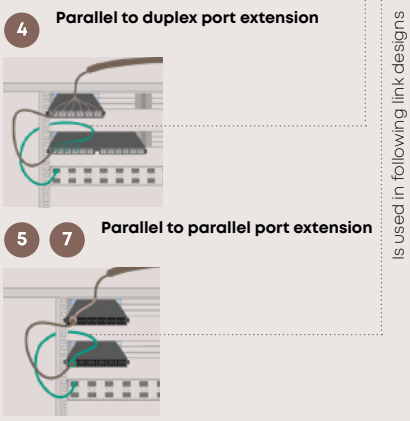
MTP Pro patch cord alterations

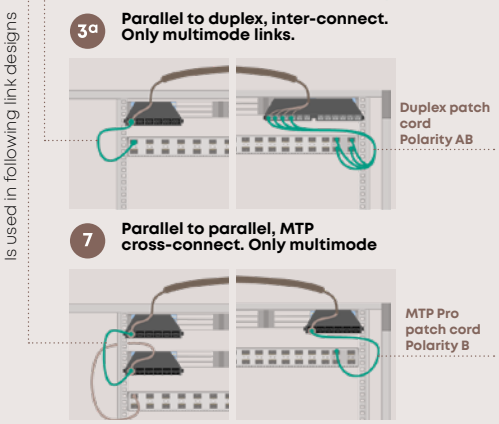
Changing the gender - for port extension links
With MTP Pro the gender of a connector can be changed from female to male and back.



Changing the polarity - for in-rack connections
With MTP Pro the polarity of an assembly can be changed from B to A and back, by changing the connector at one end. Only multimode is supported.







MTP Pro patch cords

Technical data

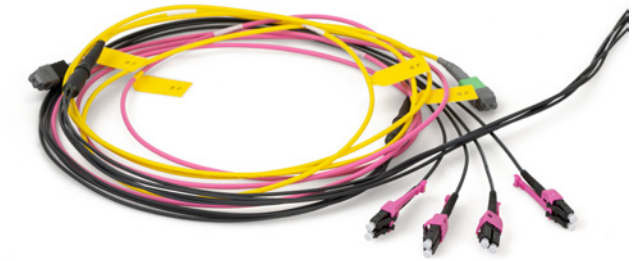
Fiber type	E9/125A2, ITU G.657.A2	G50/125-OM4, ITU G.651 Bend-optimized
Cable type	Optipack cable, 12 fiber, ø2mm	
CPR	Dca-s1a,d0,a1	
Polarity	B	B (convertible to A)
Connector side A	MTP Pro female (convertible to male)	
Connector side B	MTP Pro female (convertible to male)	
Insertion loss, per connector	0.1 dB / 0.35 dB (mean / max)	
Return loss, per connector	Min. 60 dB	Min. 30 dB

Ordering information

Length, m	Length, ft	Item number	Description code
1 m	4'	85184335	MB12_MPAF_MPAF_A220y_01.0_BB
2 m	7'	85184362	MB12_MPAF_MPAF_A220y_02.0_BB
3 m	10'	85184363	MB12_MPAF_MPAF_A220y_03.0_BB
4 m	15'	85184364	MB12_MPAF_MPAF_A220y_04.0_BB
5 m	17'	85184365	MB12_MPAF_MPAF_A220y_05.0_BB
> 5 m	> 17'	Use MTP Pro jumper and reconfigure to patch cord	

Length, m	Length, ft	Item number	Description code
1 m	4'	85184386	MB12_MPMF_MPMF_0420y_01.0_LL
2 m	7'	85184388	MB12_MPMF_MPMF_0420y_02.0_LL
3 m	10'	85184392	MB12_MPMF_MPMF_0420y_03.0_LL
4 m	15'	85184393	MB12_MPMF_MPMF_0420y_04.0_LL
5 m	17'	85184394	MB12_MPMF_MPMF_0420y_05.0_LL
> 5 m	> 17'	Use MTP Pro jumper and reconfigure to patch cord	

Harness cables



Harness cables are in-rack single jacketed cables with a MTP Pro connector at one end and four duplex connectors on the other end. They are supposed to directly connect one parallel transceiver to four duplex transceivers (so called breakout mode) located in the same rack.

Harness cables can also be used in other structured cabling scenarios. These scenarios are not shown in the brochure to maintain simplicity.

Applications

- Parallel to duplex direct-connect

Features

- Polarity flipping without tool
- Reduced cable diameters
- Push-pull mechanism, pulling antigrip tab
- Labelling possibility

Optipack harness, 8 fiber

Technical data

Fiber type	E9/125A2, ITU G.657.A2	G50/125-OM4, ITU G.651 Bend-optimized
Cable type	Optipack cable, 8 fiber, ø2mm	
CPR	Dca-s1a,d0,a1	
Breakout application examples	· 40G SR4 to 4x 10G SR · 100G SR4 to 4x 25G SR	· 100G PSM4 to 4x 25G LR · 400G DR4 to 4x 100G DR
Polarity	NP (convertible to NS by altering polarity on LC)	NP (convertible to NS by altering polarity on MTP)
Connector side A	MTP Pro female (convertible to male if required)	
Connector side B	4x LC-XD UPC duplex	4x LC-XD duplex
Insertion loss, per assembly	0.30 dB / 0.65 dB (mean / max)	0.30 dB / 0.50 dB (mean / max)
Return loss, per assembly	Min. 60 dB	Min. 30 dB

Ordering information

Length, m	Length, ft	Item number	Description code
1 m	4'	85197823	OH08NPL_DA0001D_0000PF_5080LP
2 m	7'	85197878	OH08NPL_DA0002D_0000PF_5080LP
3 m	10'	85197879	OH08NPL_DA0003D_0000PF_5080LP
4 m	15'	85197880	OH08NPL_DA0004D_0000PF_5080LP
5 m	17'	85197881	OH08NPL_DA0005D_0000PF_5080LP

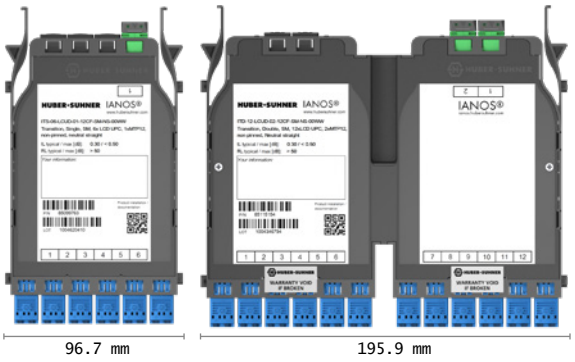
Length, m	Length, ft	Item number	Description code
1 m	4'	85197825	OH08NPL_DA4001D_0000PF_5080LP
2 m	7'	85197826	OH08NPL_DA4002D_0000PF_5080LP
3 m	10'	85197827	OH08NPL_DA4003D_0000PF_5080LP
4 m	15'	85197828	OH08NPL_DA4004D_0000PF_5080LP
5 m	17'	85197829	OH08NPL_DA4005D_0000PF_5080LP

Product drawings

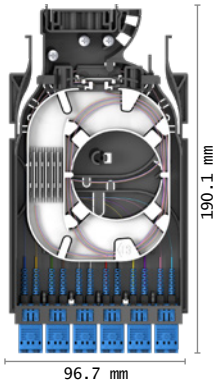
Below you can find all the relevant drawing and product dimension to plan your white space structured cabling solution.

IANOS modules

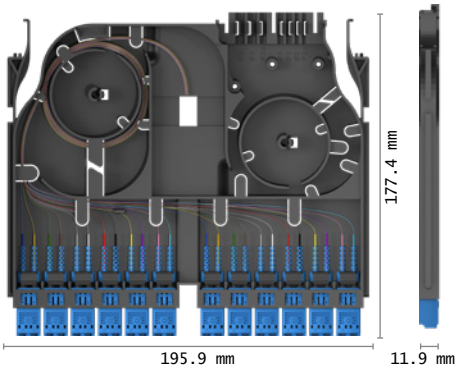
Patch, transition single and double



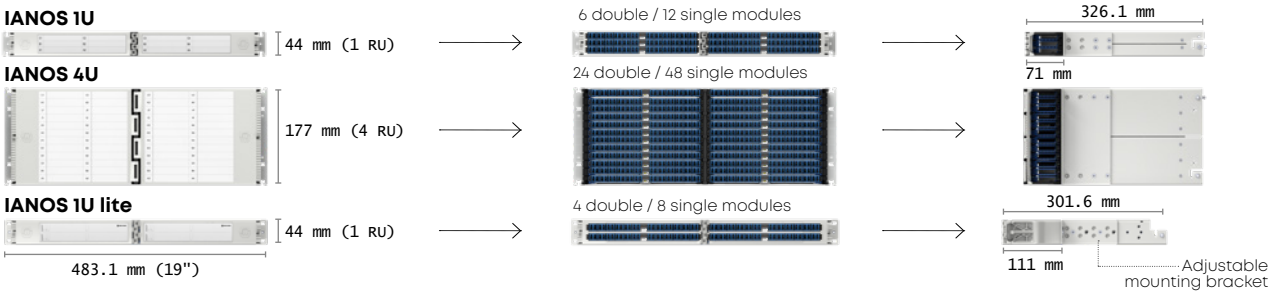
Single splice

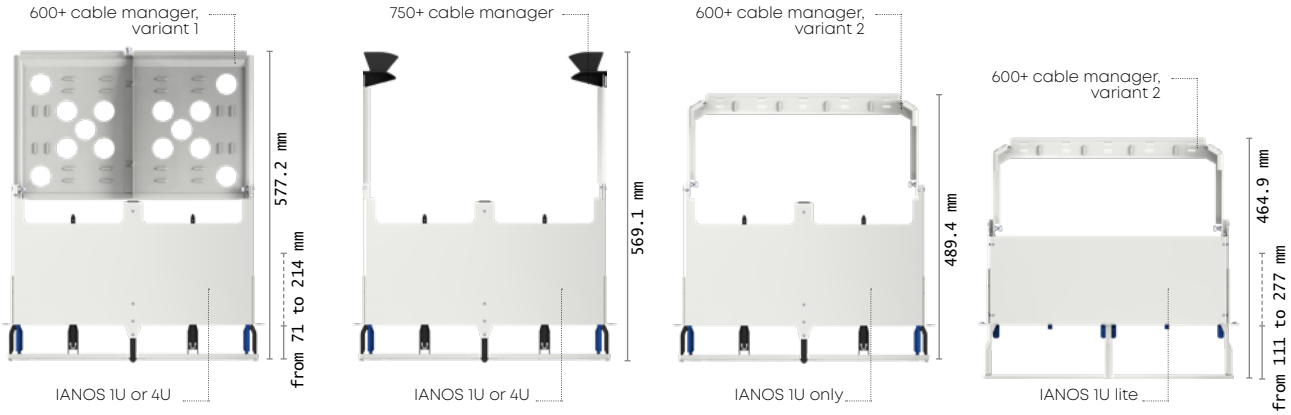


Double splice

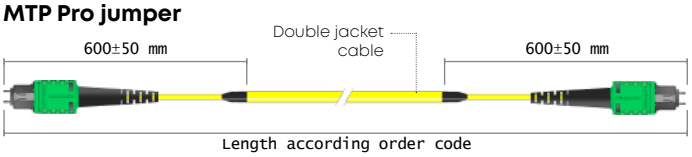


Panels and accessories

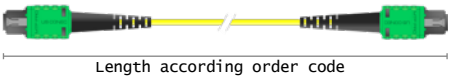




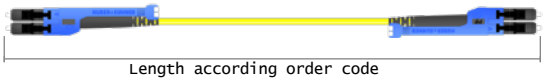
MTP Pro jumper



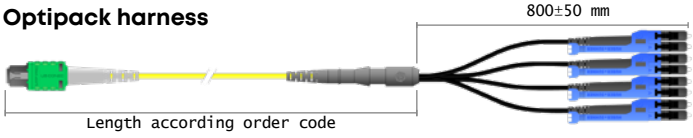
MTP Pro patch cord



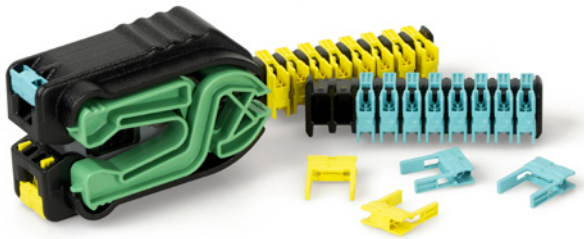
Duplex assembly



Optipack harness



MTP Pro tools



Due to the possibility to reconfigure the MTP Pro connector, many different cabling scenarios are possible with the same MTP jumper or patch cord.

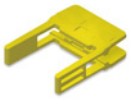
Features

- With the field tool you can remove or add pins to the connector allowing to change female to male and back
- You can change the key of multimode MTP Pro connector so that polarity of assembly can be changed from A to B and vice versa
- Pin exchangers required to remove (female version) or add pins (male version) to the MTP connector

MTP Pro field tool

Technical data	
Packing unit	1 pce
Ordering information	85096933 FIELD_TOOL_MT_PRO

MTP Pro pin exchangers



Technical data				
Packing unit	10 pcs			
Colour	Yellow (for singlemode connectors)		Turqoise (for multimode connectors)	
Gender	female (without pins)	male (with pins)	female (without pins)	male (with pins)
Ordering information	85096882 PIN_EX_MT_PRO_YE_10-P	85096884 PIN_EX_MT_PRO_SME_YE_10-P	85096881 PIN_EX_MT_PRO_TQ_10-P	85096883 PIN_EX_MT_PRO_MME_TQ_10-P

Cleaning tools

Always inspect a connector before any mating. If a connector is not clean, first try the dry cleaning method with the listed cleaning tools below. In most cases that is sufficient. However, sometimes wet cleaning is required. Please ask your partner for wet cleaning solutions.

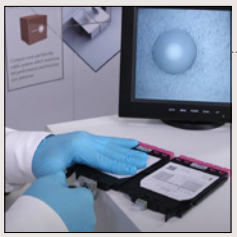
Features

- Universal push style cleaner for both adapter (behind the wall connector) and plug
- More than 525 cleans per one device

IBC™ push cleaners

Technical data		
Connector type	LC	MTP
Ferrule	1.25 mm	MT ferrule
Cleaning method	Dry	
Number of cleans per item	>525	>525
Ordering information	84065528 Cleaner, IBC, 1.25mm	84097537 MTP-IBC-7104

General procedure for inspection and cleaning



Product summary

Modules and panels

1 Transition

85099763
ITS-06-LCUD-01-12CF-SM-NS-00WW

85115154
ITD-12-LCUD-02-12CF-SM-NS-00WW

85072956
ITD-12-LCUD-03-08CF-SM-NS-00WW

85125715
ITS-06-LCMD-01-12AF-O4-NS-00UU

85115173
ITD-12-LCMD-02-12AF-O4-NS-00UU

85072955
ITD-12-LCMD-03-08AF-O4-NS-00UU

2 Splice

85115852
ISS-06-LCUD-00-0000-SM-04-H1S0

85115850
ISS-06-LCMD-00-0000-O4-04-H1L0

85072934
ISD-12-LCUD-00-0000-SM-04-H1S0

85072937
ISD-12-LCMD-00-0000-O4-04-H1L0

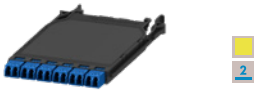
85141996
ISS-06-LCUD-00-0000-SM-02-S0S0

85141997
ISS-06-LCMD-00-0000-O4-02-S0L0

85140268
ISD-12-LCUD-00-0000-SM-02-S0S0

85140240
ISD-12-LCMD-00-0000-O4-02-S0L0

3 Patch



85072924
IPS-06-LCUD-00-0000-SM-00-0000

85073355
IPS-06-LCMD-00-0000-O4-00-0000

85116941
IPS-06-12AF-00-0000-00-00-0000

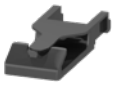
4 Panels

85102690
IANOS-STD-CHASSIS-FLX-1U-2G-T4

85103010
IANOS-STD-CHASSIS-FLX-4U-2G-T4

85086220
IANOS-LITE-STANDARD-T4

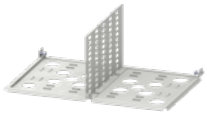
4 Accessories



85069563
IANOS-LAYER-CLIP-BK

85181140
IANOS-LABEL-DOOR-1U-T4

85069473
IANOS-REAR-CABLE-MGR-1U-T4



85069474
IANOS-REAR-CABLE-MGR-4U-T4

85108771
IANOS-CABLE-MANAGER-REAR-1U

85108772
IANOS-CABLE-MANAGER-REAR-4U

85107331
IANOS-LITE-REAR-CAB-MGR-1U-T4

Transceivers

5 Duplex

SFP+ 10G SR

SFP28 25G SR

SFP28 25G LR

QSFP28 100G CWDM4

QSFP-DD 400G FR4

6 Parallel

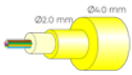
QSFP+ 40G SR4

QSFP28 100G SR4

QSFP28 100G PSM4

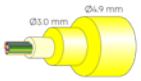
QSFP-DD 400G DR4

Click to see more transceivers



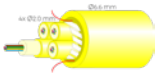
12 B

85137705
12-E9A2/(ZN)HH-E20#B



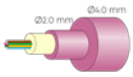
24 B

85102544
24-E9A2/(ZN)HH-E30#B



12 B

85089314
48-12E9A2/(ZN)SNH-E20#B



12 B

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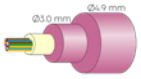
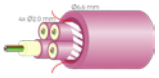


24 B

85103329
24-G50/(ZN)HH-L30-G#B



12 B

85092256
48-12G50/(ZN)SNH-L20-G#B

12 B

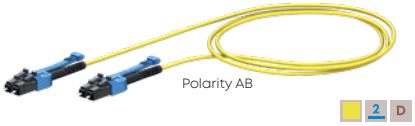
MB12_MPAM_MPAM_A240y_xxxx_BB

5 m	85166291	25 m	85166295	45 m	85184309
7 m	85184251	27 m	85184255	47 m	85184310
10 m	85166292	30 m	85166296	50 m	85166299
12 m	85184252	32 m	85184256	60 m	85166300
15 m	85166293	35 m	85166297	70 m	85166301
17 m	85184253	37 m	85184257	80 m	85166302
20 m	85166294	40 m	85166298	90 m	85166303
22 m	85184254	42 m	85184258	100 m	85166304

12 B

MB12_MPMM_MPMM_0440y_xxxx_LL

5 m	85166275	25 m	85166285	45 m	85166289
7 m	85166280	27 m	85184367	47 m	85184385
10 m	85166281	30 m	85166286	50 m	85166290
12 m	85166282	32 m	85184368		
15 m	85166283	35 m	85166287		
17 m	85179962	37 m	85184369		
20 m	85166284	40 m	85166288		
22 m	85184366	42 m	85184370		



2 D

PCRS_LCUX_LCUX_A221T_xxxx_SS

1 m	85016597	5 m	85016601	17 m	85144374
2 m	85016599	7 m	85020820	20 m	85020822
3 m	85016600	10 m	85016602	25 m	85025976
3.5 m	85020818	12 m	85085713	30 m	85025977
4 m	85019951	15 m	85020821		

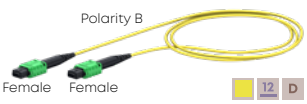
2 D

PCRS_LCMX_LCMX_0421T_xxxx_LL

1 m	85011862	5 m	85019839	17 m	85153272
2 m	85019837	7 m	85021396	20 m	85021398
3 m	85019838	10 m	85019840	25 m	85025988
3.5 m	85021394	12 m	85126556	30 m	85025989
4 m	85019950	15 m	85021397		

85141483
FLC-LAB-CLP-XD_100-P

MTP Pro patch cords



12 D

MB12_MPAF_MPAF_A220y_xxxx_BB

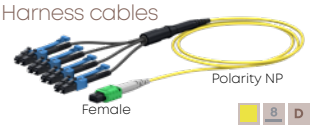
1 m	85184335
2 m	85184362
3 m	85184363
4 m	85184364
5 m	85184365

12 D

MB12_MPMF_MPMF_0420y_xxxx_LL

1 m	85184386
2 m	85184388
3 m	85184392
4 m	85184393
5 m	85184394

Harness cables



8 D

OH08NPL_DA0xxxD_0000PF_5080LP

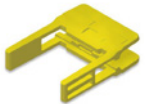
1 m	85197823
2 m	85197878
3 m	85197879
4 m	85197880
5 m	85197881

8 D

OH08NPL_DA4xxxD_0000PF_5080LP

1 m	85197825
2 m	85197826
3 m	85197827
4 m	85197828
5 m	85197829

85096933
FIELD_TOOL_MT_PRO



85096882
PIN_EX_MT_PRO_YE_10-P

85096884
PIN_EX_MT_PRO_SME_YE_10-P

85096881
PIN_EX_MT_PRO_TQ_10-P

85096883
PIN_EX_MT_PRO_MME_TQ_10-P

84065528
Cleaner, IBC, 1.25mm

84097537
MTP-IBC-7104

Connecting – today and beyond

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4694/4743/12.2022

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