Telenco

CONNECTIVITY Solutions

Developing tomorrow's networks, today

DISCOVER YOUR
CONNECTIVITY CATALOGUE

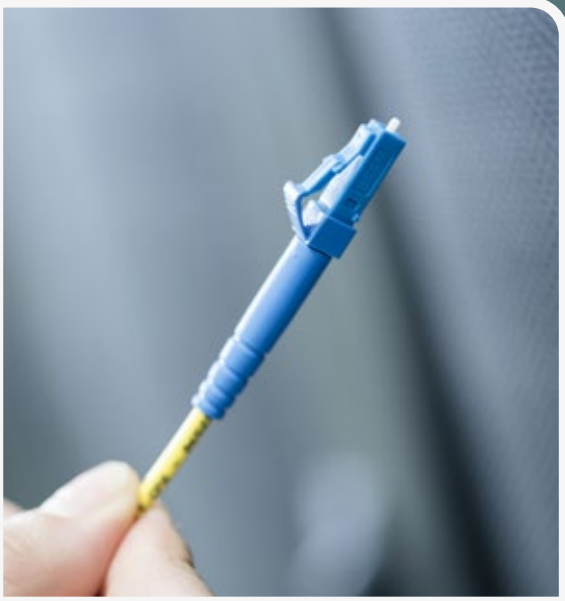
Connectivity covers all the optical connectivity solutions used for enabling data transmission.

Telenco networks' Connectivity solutions include different networks:

- Telecom networks
- Datacenter networks
- Private networks

As well as equipment to connect them:

- Transceivers and multiplexers

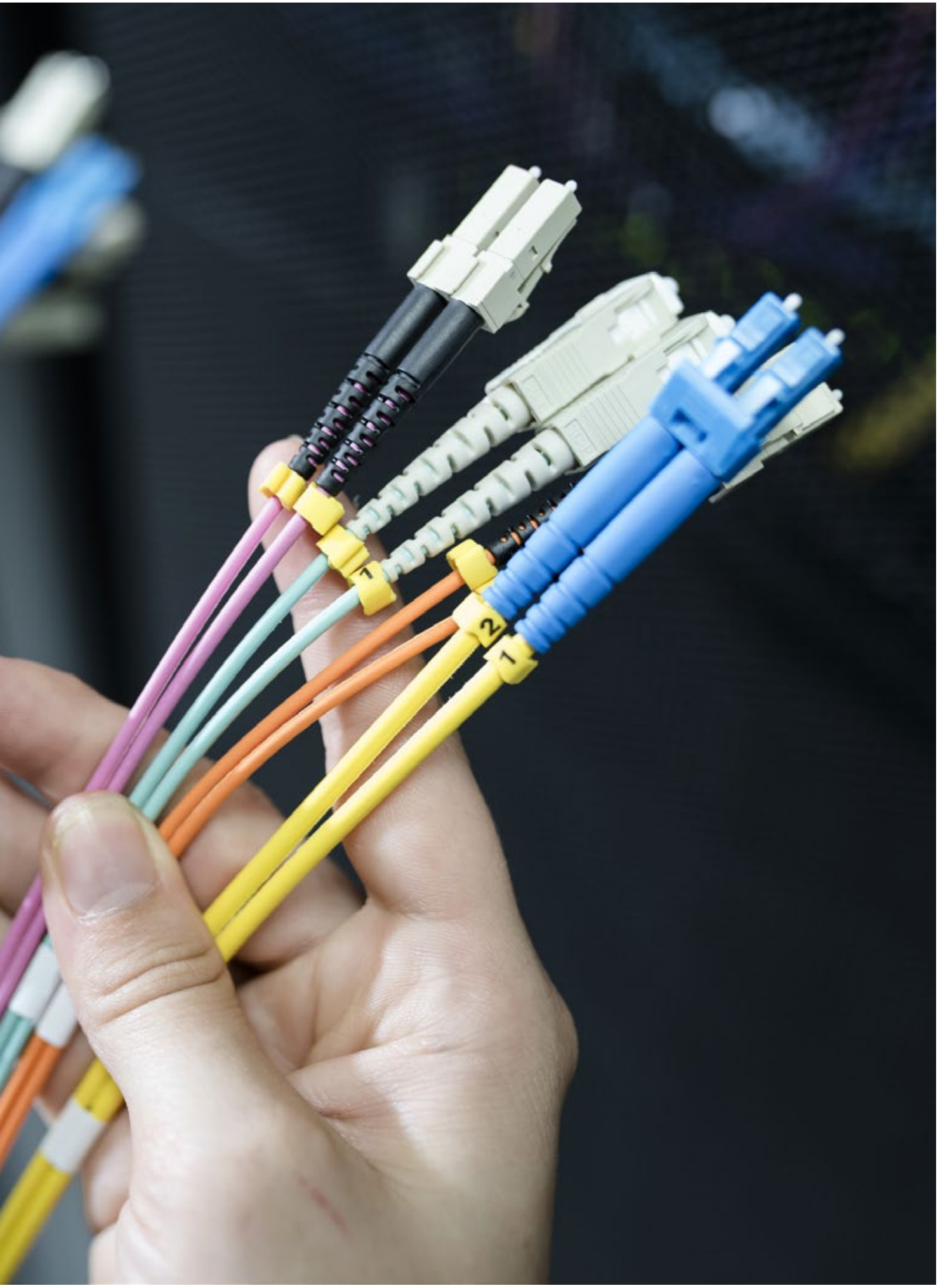


Telecom networks

Datacenter networks

Private networks

Transceivers and multiplexers



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FIBRE AND CONNECTOR REMINDER

General information

Here are the decisive criteria for the choice of connectors, fibre type, cable and optical connectivity specifications:

- Application
- Environmental constraints
- The network's specificities
- Trade standards
- Local specifications
- Terms of reference

The various types of fibre

Singlemode fibres

G.652.D
- Yellow colour
- Ø 9/125µm
- Standard singlemode fibre
- Non-delayed dispersion

G.657.A
- Yellow colour
- Ø 9/125µm
- Small bending radius:
  - A1 = 10mm
  - A2 = 7.5mm

G.657.B
- Yellow colour
- Ø 9/125µm
- Small bending radius:
  - A1 = 7.5mm
  - A2 = 5mm

Multimode fibres

OM3
- Aqua colour
- Ø 50/125µm
- From 800m to 1Gbit/s
- From 300m to 10Gbit/s
- From 100m to 40Gbit/s
- From 100m to 100Gbit/s

OM4
- Magenta colour
- Ø 50/125µm
- From 1100m to 1Gbit/s
- From 400m to 10Gbit/s
- From 150m to 40Gbit/s
- From 150m to 100Gbit/s

Fibre optic colour code

XP C 93-850-3-25

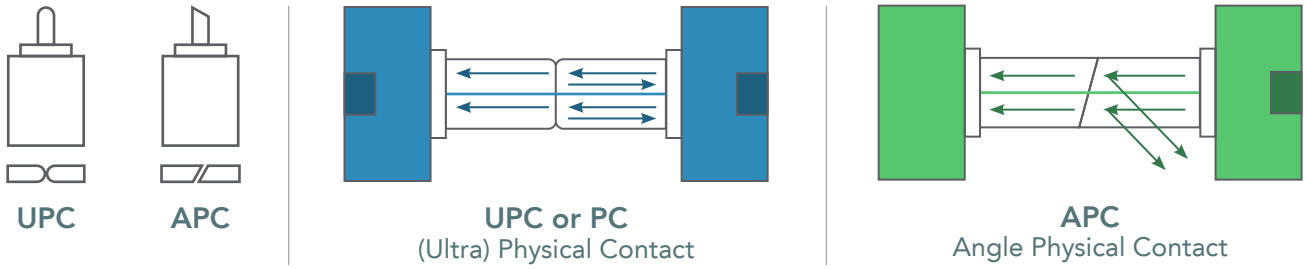
Fibre position	Colour
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

EIA598-A (FOTAG)

Fibre position	Colour
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

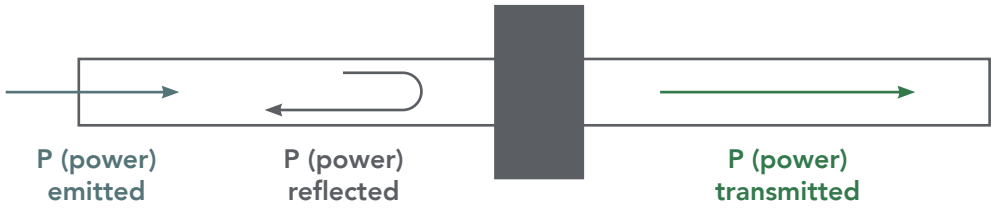
Fibre position	Colour
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	

The different polishing types

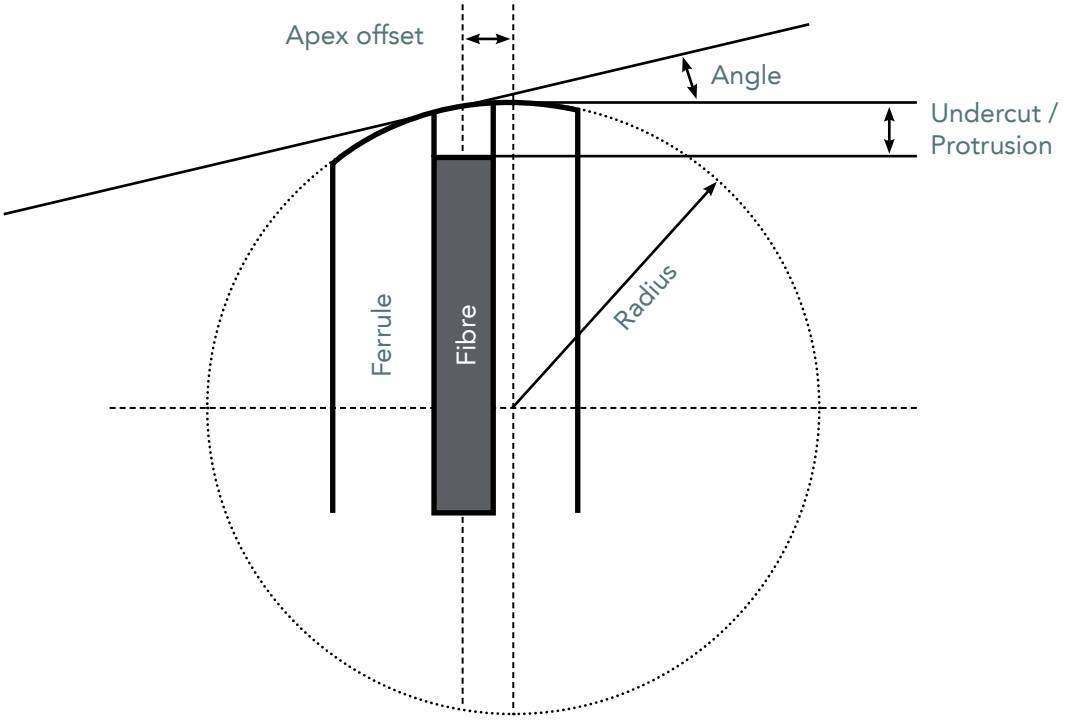


The APC polishing, only available with singlemode fibre, improves the RL value (Return Loss indB), which has a double effect:

- **Reduces the risks of signal interference**
- **Preserves optical transmitters**



Geometrical criteria of the optical face



The connectors

The IL/RL Telenco performances

The Telenco® singlemode connectors are Grade B1 in APC version and Grade B2 in UPC version.

Attenuation (Insertion Loss: IL)	Attenuation value for random connection according to IEC 61300-3-34
Grade B	≤ 0.12dB on average and ≤ 0.25dB max for 97% of connections

Reflectance (Return Loss: RL)	Reflectance value for random connection according to IEC 61300-3-6	
Grade 1	≥ 60dB	APC polishing
Grade 2	≥ 50dB	UPC polishing

The MTP® connectors

MTP® is a registered trademark of US Conec Ltd.

The MTP® US Conec connectors offer enhanced features over traditional MPO connectors. They are equipped with a floating ferrule in order to reduce insertion loss values. They also have guide pins that improve the alignment of male and female connectors, allowing thus for multiple insertions.

Telenco networks exclusively uses MTP® Elite connectors for the manufacture of its MTP® trunks.

MTP® polarity type A - Right		Fibres											
A connector	Key up	1	2	3	4	5	6	7	8	9	10	11	12
B connector	Key down	1	2	3	4	5	6	7	8	9	10	11	12

MTP® polarity type B - Reversed		Fibres											
A connector	Key up	1	2	3	4	5	6	7	8	9	10	11	12
B connector	Key down	12	11	10	9	8	7	6	5	4	3	2	1

MTP® polarity type C - Pair to pair crossover		Fibres											
A connector	Key up	1	2	3	4	5	6	7	8	9	10	11	12
B connector	Key down	2	1	4	3	6	5	8	7	10	9	12	11

The singlemode (SM) connectors


SC/APC


LC/APC


LC/APC Duplex


E2000/APC


FC/APC


MTP®/APC


SC/UPC


LC/UPC


LC/UPC Duplex


E2000/UPC


ST/UPC


FC/UPC


MTP®/UPC

The multimode (MM) connectors


SC/PC


LC/PC


LC/PC Duplex


E2000/PC


FC/PC


ST/PC


MTP®/PC

The most commonly used connectors

Telecom networks

Singlemode


SC/APC
= SCA


SC/UPC
= SCU


LC/APC
= LCA


LC/UPC
= LCU


FC/UPC
= FCU

Datacenter networks / Private networks

Singlemode


LC/UPC
= LCU


SC/UPC
= SCU


MTP®/APC -
MPO/APC
= MTA

Multimode


LC = LCU


SC = SCU


MTP®/PC-
MPO/PC
= MTP®

Special connectors

To provide its customers with ever more innovative solutions, Telenco networks develops and assembles special connectors allowing greater security and durability for fibre optic networks.

The secured version of SC connectors

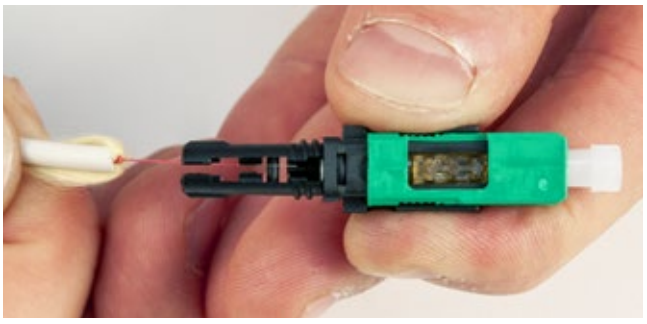
The Telenco SC Secure connectors are high-end self-locking fibre optic cabling systems.
They enable the protection of critical networks against disconnection errors or malicious acts.

SC connectors with permanent protection

The SC connectors with permanent protection allow to keep connectors on hold. The multiplication of connections/disconnections can be carried out without risk for the optical faces and by saving time for users, all while also bringing a real ecological gain to the installations requiring an intensive patching.

Telenco® field mountable connectors

Droptic® cables are compatible with field mountable connectors. Field mountable connectors offer a similar optical performance to that provided by standard connectors. They are quick and easy to install on jobsite, while also ensuring a high level of reliability. These connectors can be installed on 250µm, 900µm or 3mm fibre optic cables.



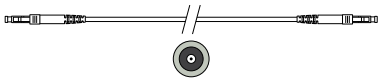
The OptiTap® Corning® hardened connectors

Telenco networks has the licence to install the OptiTap® hardened connectors by Corning.

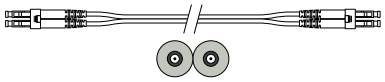
The OptiTap® hardened connectors by Corning peuvent can be mounted on Droptic® LM4, LX030PU and LX030PUR drop cables, when packaged in cable coils.

Pre-terminated fibre optic links

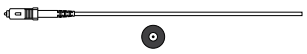
The various structures



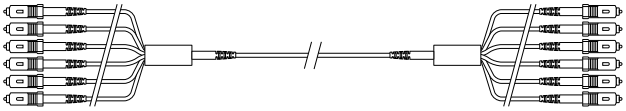
Simplex cord



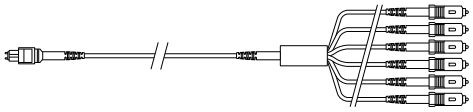
Duplex cord



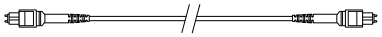
Pigtail



Standard connectors trunk



MTP®/standard connectors trunk



MTP®/MTP® trunk

Telenco® cable protective end caps

Telenco networks offers specific cable protective end caps, equipped with a pulling eye, used for protecting the ends of pre-terminated cables during the installation phase.

The length of the protective end cap is adjustable on request, from 30cm to 1m.

How to configure a pre-terminated optical trunk with standard connectors or standard connectors/ MTP® - MPO ?

1. Define its application:
- Indoor, space saving
- Indoor, reinforced
- Outdoor

2. Set the total cable length:
- Expressed in meters

3. Define the fibre type:
- G.652D
- G.657A2
- OM3
- OM4

4. Define the number of connectors
- From 1 to 144 FO

5. Define the A side fanouts:
- Determine the connector type: SC / LC / FC / ST / E2000 / Secure SC / MTP®-MPO* / Bare
- Define the polishing of connectors: SM APC / SM UPC / MM PC
- Length of the A side fanout: from 0.3m to 3m (1.0m if not specified)
- Fibre strand diameter: from 0.9mm to 3.0mm
- Aligned or staggered connectors
- Simple or double stage (set the 2 lengths in this case)

6. Define the B side fanouts:
- Determine the connector type: SC / LC / FC / ST / E2000 / Secure SC / MTP®-MPO* / Bare
- Define the polishing of connectors: SM APC / SM UPC / MM PC
- Length of the B side fanout: from 0.3m to 3m (1.0m if not specified)
- Fibre strand diameter: from 0.9mm to 3.0mm
- Aligned or staggered connectors
- Simple or double stage (set the 2 lengths in this case)

**if MTP®- MPO connector, see product description above*

How to configure a pre-terminated MTP® - MPO trunk?

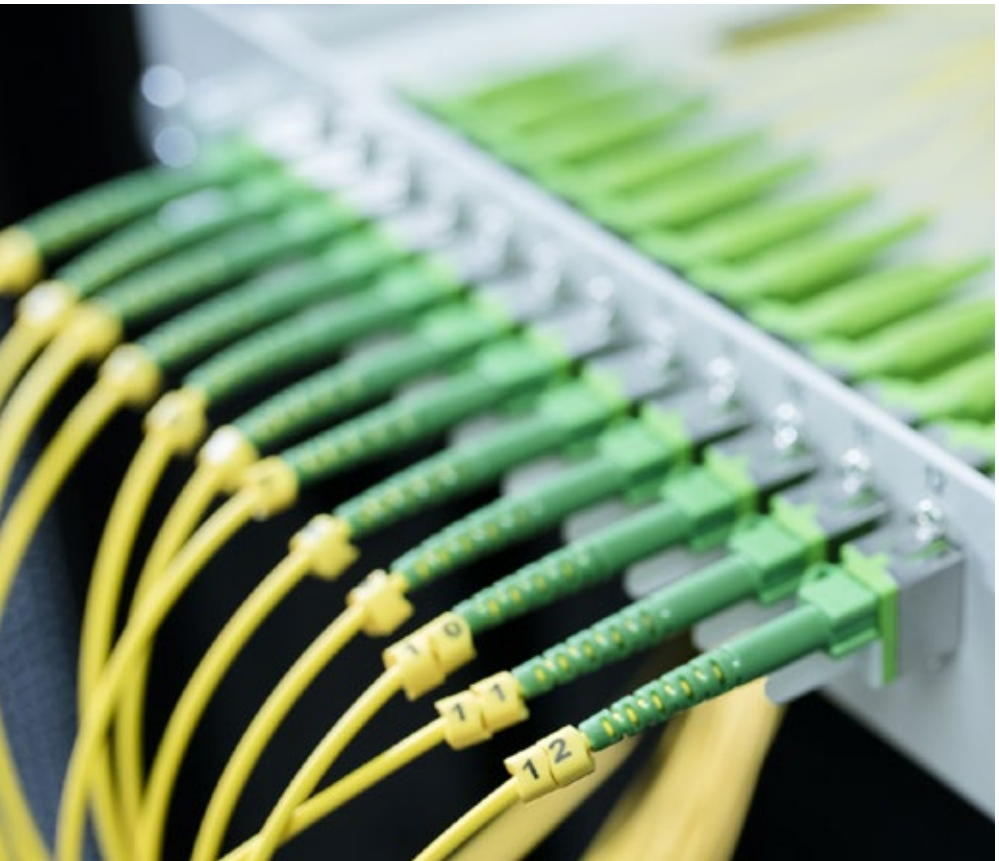
1. Define its application:
- Indoor, maximum space saving
- Indoor, reinforced
- Outdoor

2. Set the total cable length:
- Expressed in meters

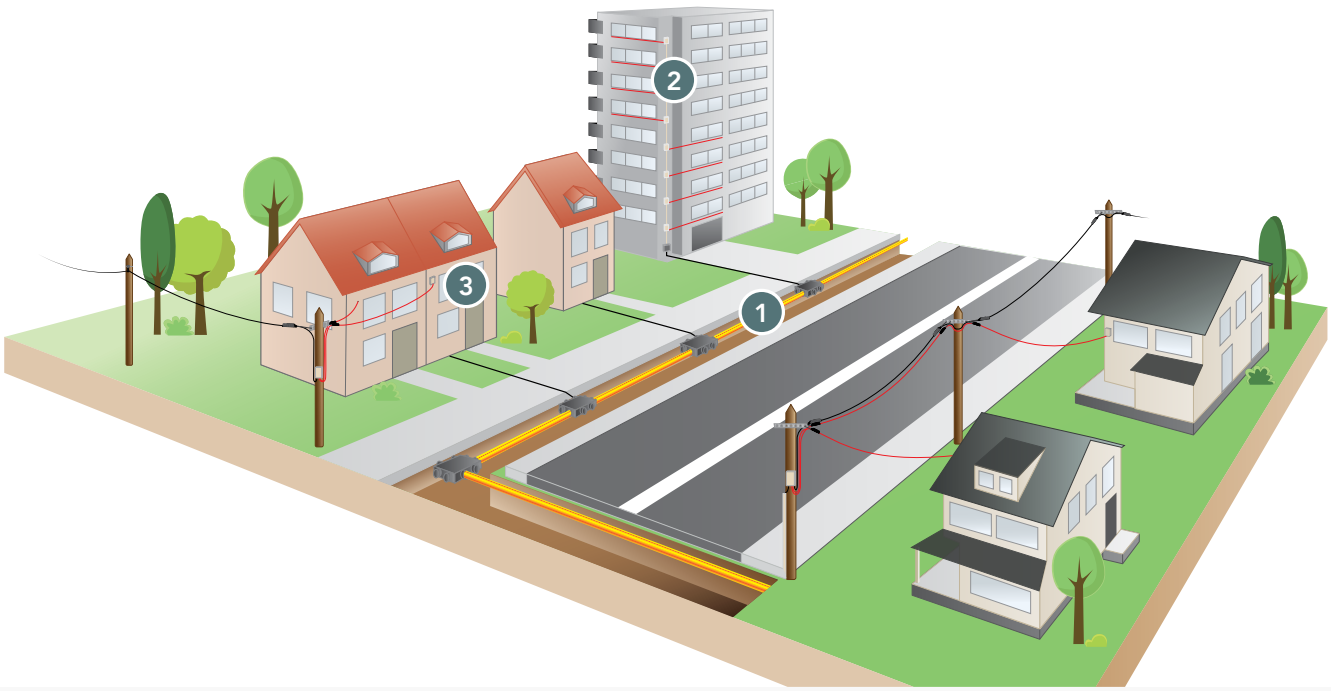
3. Define the fibre type:
- G.652D
- G.657A2
- OM3
- OM4

4. Define the MTP®/MPO type, according to:
- Fibre count: 8FO/ 12FO/ 24FO
- The polarity: A / B /C
- Type: Male / Female
- The polishing: SM APC / AM UPC / MM PC

Telecom networks



With the expansion of Very High-Speed Internet access, the Fibre To The Home (FTTH) technology is booming. This technology consists into deploying fibre optic networks from the Central Office to the subscriber's premises, whether the later are homes, businesses or public buildings (FTTB/FTTO).



The 3 stages of the FTTH rollout:

1

ON THE ROADS

horizontal rollout

2

IN BUILDINGS

vertical rollout

3

INSIDE THE DWELLINGS OR PREMISES

final rollout

In order to meet the growing need for reliable and ultrafast data transfer rates for individuals and businesses, the deployment of FTTH networks is today a key issue. Telenco networks offers a complete range of products for telecoms networks such as:

- Optical patchcords and pigtails
- Pre-terminated cables
- Optical patch panels
- Splitters
- Adaptors and attenuators

OPTICAL PATCHCORDS AND PIGTAILS

Optical patchcords

Simplex optical patchcord Ø 1.6/2.0mm

The Telenco® optical patchcords offer optimal performances so to ensure reliable network connections. They are used for cross-connecting applications within telecom networks and, therefore, they are in great demand.
These patchcords can be equipped with standard SC, LC and FC connectors, as well as with Secure SC and SC connectors with permanent protection.
Telenco® optical patchcords are fully compliant with the IEC-61300 standards.

PN	Connector type	Fibre type	Colour	Diameter	Length	Weight
91011	SC/APC	G.657A2	Yellow	Ø 1.6mm	3.5m	0.03kg

The product's benefits:

+ Premium optical quality
+ Great flexibility
+ Easy to install
+ Highly resistant to impact and crush
+ Great durability
+ 100% configurable

Available configurations:


SC/APC


SC/UPC


LC/APC


LC/UPC


FC/UPC


Secure SC


SC with permanent protection

Colours:

Fibre type: G.657A2, G.652D
Length: from 0.5m to 40m
Diameter: Ø 1.6mm, Ø 2m

Parameter	Specifications
IEC-61300	100% compliant
Connector material	Body: thermoplastic / Ferrule: Zirconia
Cable material	LSZH (Low Smoke Zero Halogen)
Insertion Loss (IL)	Grade B ≤ 0.12dB on average and ≤ 0.25dB max for 97% of connections
Return Loss (RL)	≥ 60dB (APC) and ≥ 50dB (UPC)
Mechanical tests	Δ IL ≤ 0.20dB
Environmental tests	
Temperature	Operation, transport and storage: -40° C / +75° C
Tensile strength	70N

Telenco reserves the right to modify specifications without prior notice

Optical subscriber patchcords

Simplex optical subscriber cable Ø 3.0mm

The Telenco® optical subscriber patchcords are used to link the Optical Telecommunications Outlet or the DTIO (an optical outlet used as an intermediate distribution point between the outdoor and indoor installation) to the ONT or the Internet box. Their structure is designed for a full compatibility with a residential use. These optical subscriber patchcords are also available in a steel reinforced version, offering an extreme resistance to crush. They can be equipped with standard SC and LC connectors, as well as with Secure SC or SC connectors with permanent protection.
The Telenco® optical subscriber patchcords are fully compliant with the IEC-61300 standard.

PN	Connector type	Fibre type	Colour	Diameter	Length	Weight
92879	SC/APC	G.657A2	White	Ø 3.0mm	2.0m	0.03kg

The product's benefits:

+ High precision ceramics
+ Great interoperability
+ Easy to install
+ Excellent mechanical and temperature stability
+ 100% configurable

Available configurations:

SC/APC

SC/UPC

LC/APC

LC/UPC

Secure SC

SC with permanent protection

Colour:

◯

Fibre type: G.657A2, G.657B3
Length: from 0.5m to 4.0m
Diameter: Ø 3mm

Parameter	Specifications
IEC-61300	100% compliant
Connector material	Body: thermoplastic / Ferrule: Zirconia
Cable material	LSZH (Low Smoke Zero Halogen)
Insertion Loss (IL)	Grade B ≤ 0.12dB on average and ≤ 0.25dB max for 97% of connections
Return Loss (RL)	≥ 60dB (APC) and ≥ 50dB (UPC)
Mechanical tests	Δ IL ≤ 0.20dB
Environmental tests	
Température	Operation, transport and storage: -40° C / +75° C
Tensile strength	70N

Telenco reserves the right to modify specifications without prior notice

Simplex Stainless steel armoured optical subscriber patchcord Ø 3.0mm

Telenco

The Telenco® stainless steel armoured optical subscriber patchcords consist of an ultra-lightweight stainless steel spiral tube integrated into the sheath and protecting thus the fibre. These optical subscriber patchcords provide extra protection and have the particularity of being extremely flexible. This allows for an easy installation, even in limited indoor spaces. Both their structure and materials have been engineered to meet residential use.

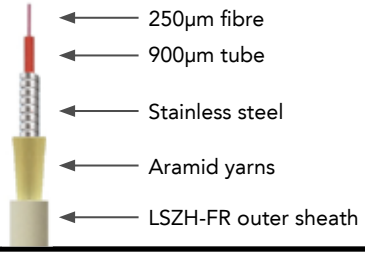
Telenco® stainless steel armoured optical subscriber patchcords present a high resistance to impact and crush and are, therefore, very durable. They also offer excellent protection against rodents. These optical subscriber patchcords can be equipped with standard SC and LC connectors, as well as with Secure SC connectors. The Telenco® stainless steel armoured optical subscriber patchcords are fully compliant with the IEC-61300 standard.

PN	Connector type	Fibre type	Colour	Diameter	Length	Weight
91497	SC/APC	G.657A2	Blanc	Ø 3,0mm	2,0 m	0,03kg

The product's benefits:

+ Premium optical quality
+ Great flexibility
+ Easy to install
+ Highly resistant to impact and crush
+ Great durability
+ 100% configurable

Cable structure



Available configurations:

SC/APC | SC/UPC | LC/APC | LC/UPC | Secure SC

Colour:

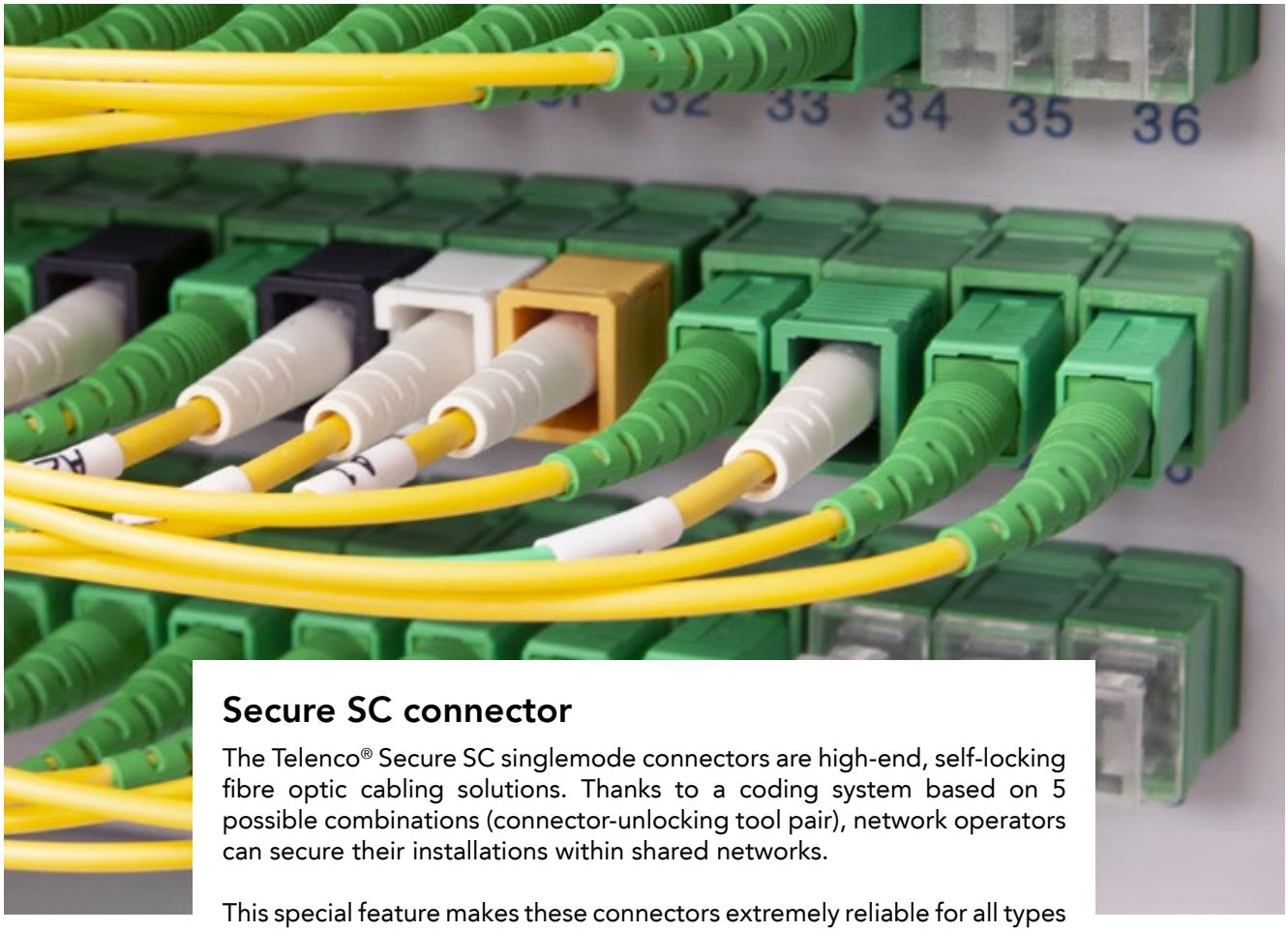
Fibre type: G.657A2, G.657B3
Length: from 0.5m to 4.0m
Diameter: Ø 3mm

The stainless steel armoured optical subscriber patchcords also benefit from:

Parameter	Specifications
Cable reinforcement material	Stainless steel
Crush resistance	≥ 3000 N/100mm

Telenco reserves the right to modify specifications without prior notice

Special connectors



Secure SC connector

The Telenco® Secure SC singlemode connectors are high-end, self-locking fibre optic cabling solutions. Thanks to a coding system based on 5 possible combinations (connector-unlocking tool pair), network operators can secure their installations within shared networks.

This special feature makes these connectors extremely reliable for all types of strategic networks (telecom, enterprise, military, industrial,…). With a rugged construction, the Telenco® Secure SC singlemode connectors can be easily plugged into any patch panel or any other connectivity solution equipped with standard SC connectors.

The Telenco® Secure SC singlemode connectors are compatible with standard cables of all colours and diameters up to 3mm. They provide important protection for sensitive links against deliberate or unintentional disconnections.

The Telenco® Secure SC singlemode connectors are fully compliant with the IEC-61300 standard.

Telenco

The product's benefits:

+ Self-locking connector
+ High-end optical performances
+ Easy to install and to use
+ Compatible with standard SC connectors
+ Compact and rugged unlocking tool
+ 5 code combinations

Simplex Secure SC/APC optical cord G.657A2

PN	Cable colour	Coding colour	Diameter	Length	Weight
92407	White	Green	Ø 3.0mm		
92541		Yellow			
92542		Blue			
92543	Yellow	Black	Ø 1.6mm	3.5m	0.02kg
92544		Grey			
92545		White			
91878	Yellow/Black	Yellow	Ø 1.8mm		

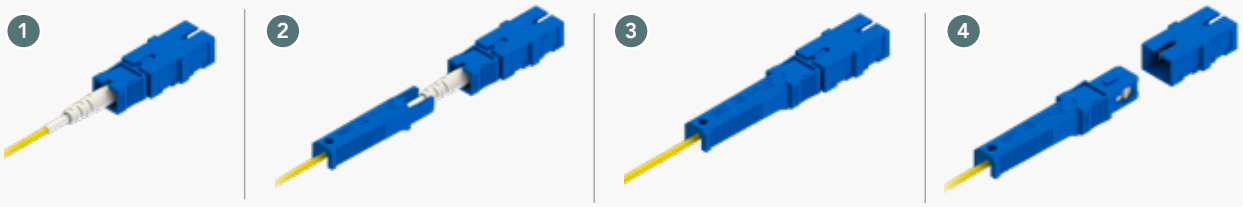
Tool for Secure SC connectors

PN	Coding colour	Weight
92551	Yellow	
92552	Blue	
92553	Black	0.01kg
92554	White	
92385	Green	

Coding system and installation

The Telenco® SC Secure singlemode connectors are used together with a compatible tool that acts as an unlocking key. This tool allows the removal of connectors from the installation. The colour of the unlocking tool must match with the colour of the Secure SC connector to withdraw from the installation.

Thus, there is no risk that a tool of a different colour can unlock the SC conector.



Possible coding combinations:
Available in Secure SC/APC and Secure SC/UPC versions

SC connector with permanent protection

The SC singlemode connectors with permanent protection are high-end fibre optic cabling systems. They provide a permanent protection to the ferrule against external damage or pollution contamination, allowing thus network operators to secure their installations. This special feature makes these connectors extremely reliable. Thanks to a rugged construction, the SC singlemode connectors with permanent protection can be left in standby, without having to ensure that a protective cap is set at the end of the connectors. They can be plugged into any patch panel or other connectivity solutions equipped with standard SC adaptors.

The SC singlemode connectors with permanent protection are compatible with standard cables of all colours and diameters up to 3mm. They are equipped with an automatic shutter which protects the user's eyes, even in conditions of high power (up to 0.2W).
The SC singlemode connectors with permanent protection are fully compliant with the IEC-61300 standard.

The product's benefits:

+ Automatic shutter
+ Eye protection against optical light
+ Mechanical and pollution protection of the ferrule
+ Compatible with the standard SC connectors

Available configurations:

SC/APC with permanent protection

Pigtails

Simplex pigtail Ø 900µm

The Telenco® singlemode optical pigtails are fibre optic cables with a connector installed at one end, leaving the other end bare. Accordingly, the end equipped with the connector can be plugged into a patching equipment and the other end can be spliced with fibre optic cables. Pigtails are used to terminate fibre optic cables by using fusion or mechanical splicing applications.

The Telenco® singlemode optical pigtails offer optimal performances so to ensure reliable and future-proof networks. They are used to interconnect telecom networks and, therefore, in great demand. They can be equipped with standard SC, LC and FC connectors. The Telenco® singlemode optical pigtails are fully compliant with the IEC-61300 standard.

PN	Connector type	Fibre type	Diameter	Length	Sales unit	Weight
91479	SC/APC	G.657A2	Ø 90µm	2.0m	Batch of 12	0.07kg

The product's benefits:

+ High precision ceramics
+ Great interoperability
+ Easy to install
+ Excellent mechanical and temperature stability

Available configurations:

SC/APC

SC/UPC

LC/APC

LC/UPC

FC/UPC

Colours (Orange™ colour code):

Fibre type: G.657A2, G.652D
Length: from 0.8m to 2.5m
Diameter: Ø 900µm
Packaging: 12 pieces per bag for pigtails with a length of 2m or 2.5m

Parameter	Specifications
IEC-61300	100% compliant
Connector material	Body: thermoplastic / Ferrule: Zirconia
Cable material	LSZH (Low Smoke Zero Halogen)
Insertion Loss (IL)	Grade B ≤ 0.12dB on average and ≤ 0.25dB max for 97% of connections
Return Loss (RL)	≥ 60dB (APC) and ≥ 50dB (UPC)
Mechanical tests	Δ IL ≤ 0.20dB
Environmental tests	
Température	Operation, transport and storage: -40° C / +75° C
Tensile strength	7N
Protection	Clear cap

Telenco reserves the right to modify specifications without prior notice

PRE-TERMINATED CABLES

Trunks

Micro break out trunk Ø 3.0/3.6mm

The Telenco® singlemode micro break out trunks are used for facilitating the cabling deployment in telecom networks, datacenters and high density patching environments. Thanks to their significantly reduced diameter, micro break out trunks ease and reduce installation times, offering thus a small footprint. They are used for indoor applications and are available for capacities from 1 to 24FO. The Telenco® singlemode micro break out trunks are pre-terminated in our production units and allow a quick connection between different equipment. They are 100% configurable and pre-terminated at one or both ends.

The Telenco® singlemode micro break out trunks have, as an option, a connector protection system, a pull ring and are supplied with a measurement sheet. They can be equipped with standard SC and LC connectors, Secure SC connectors, as well as with LC HD Push-Pull connectors.
The Telenco® singlemode micro break out trunks are fully compliant with the IEC-61300 standard.

PN	Connector type	Fanout length	Fibre type	Fibre count	Diameter	Length	Weight
92880	SC/APC	0.5m	G.657A2	12FO	Ø 3.0mm	10.0m	0.15kg

The product's benefits:

+ Space saving
+ Great flexibility
+ Premium optical quality
+ 100% configurable
+ Reduced installation time
+ 100% dielectric
+ Gel free

Available configurations:

SC/APC

SC/UPC

LC/APC

LC/UPC

Secure SC

LC HD Push-Pull

Colour:

Fibre type: G.657A2, G.652D
Total length: from 2m to 300m
Fan-out length: from 0.3m to 2.5m
Diameters: Ø 3mm, Ø 3.6mm

Parameter	Specifications
Fibre optic count	From 1 to 24FO
Flame retardant IEC 60332-1	100% compliant
Zero Halogen IEC 60754-2-1/-2	
Low Smoke IEC 61034-2-1/-2	
Cable material	LSZH (Low Smoke Zero Halogen)
Cable reinforcement material	Aramid yarns
Connector material	Body: thermoplastic / Ferrule: Zirconia
Minimum bending radius	Static: 5 x Ø / Dynamic: 15 x Ø
Cable diameter	From 1 to 12FO: Ø 3mm / From 13 to 24FO: Ø 3.6mm
Insertion Loss (IL)	Grade B ≤ 0.12dB on average and ≤ 0.25dB max for 97% of connections
Return Loss (RL)	≥ 60dB (APC) and ≥ 50dB (UPC)
Mechanical tests	Δ IL ≤ 0.20dB
Environmental tests	
Température	Operation, transport and storage: -40° C / +60° C

Telenco reserves the right to modify specifications without prior notice

Pre-terminated riser

The Telenco® singlemode pre-terminated risers are developed to ease the vertical distribution of optical fibre inside buildings, along technical ducts or via cable trays. They are used for indoor applications and are available in various fibre counts: 4FO / 6FO / 12FO per micromodule (MODULO 4/6/12) for a total capacity from 12 to 144FO.

The Telenco® singlemode pre-terminated risers are pre-connectorised in our production units. They allow a quick connection between the BEP (Building Entry Point) and the FDB (Floor Distribution Box). The Telenco® singlemode pre-terminated risers are 100% configurable and can be equipped with connectors at one or both ends. They have, as an option, a connector protection system, a pull ring and are supplied with a measurement sheet. They can be equipped with standard SC and LC connectors, Secure SC connectors, as well as with LC HD Push-Pull connectors.
The Telenco® singlemode pre-terminated risers are fully compliant with the IEC-61300 standard.

PN	Connector type	Modulo	Fibre count	Length	Weight
91180	SC/APC	4FO	48FO	100.0m	5.30kg

The product's benefits:

+ Vertical use
+ Premium optical quality
+ 100% configurable
+ Reduced installation time
+ 100% dielectric
+ Gel free
+ Good mechanical performances
+ Available in Modulo 4/6/12FO

Available configurations:


SC/APC


SC/UPC


LC/APC


LC/UPC


Secure SC


LC HD Push-Pull

Colours:

Cable: ○ | Fan-out 1st level: ○

Fan-out 2nd level (Orange™ code colour):

Fibre type: G.657A2
Total length: from 3m to 150m
Fan-out length: from 0.5m to 2.5m
Fan-out: single or double level
Modulo: 4FO/6FO/12FO
Diameters: Ø 6mm to Ø 12mm

Parameter	Specifications						
Fibre optic count	12FO	24FO	36FO	48FO	72FO	96FO	144FO
Flame retardant IEC 60332-1	100% compliant						
Zero Halogen IEC 60754-2-1/-2							
Low Smoke IEC 61034-2-1/-2							
Fire behaviour EN 50575	Dca, s1, d0, a1						
Cable material	LSZH (Low Smoke Zero Halogen)						
Cable reinforcement material	FRP						
Connector material	Body: thermoplastic / Ferrule: Zirconia						
Ø (mm) 4 fibres per micromodule	7.5	8.5	9.5	9.5	10.5	11.5	12
Ø (mm) 6 fibres per micromodule	7.5	7.5	8.5	9	9.5	10.5	11.5
Ø (mm) 12 fibres per micromodule	6	7.5	8	8.5	9	9.5	10.5
Insertion Loss (IL)	Grade B ≤ 0.12dB on average and ≤ 0.25dB max for 97% of connections						
Return Loss (RL)	≥ 60dB (APC) and ≥ 50dB (UPC)						
Mechanical tests	Δ IL ≤ 0.20dB						
Environmental tests							
Temperature	Operation, transport and storage: -40° C / +60° C						
Cable crush resistance	300N/10cm						
Cable tensile strength	Permanent: 160N / Installation: 480N						

Telenco reserves the right to modify specifications without prior notice

High capacity trunks

The Telenco® singlemode high capacity trunks facilitate the cabling deployment at the core of telecom networks. They are used for indoor applications and are available with capacities from 36 to 144FO. They are pre-terminated in our production units and enable a quick connection between different equipment.

The Telenco® singlemode high capacity trunks are 100% configurable and can be equipped with connectors at one or both ends. They have, as an option, a connector protection system, a pull ring and are supplied with a measurement sheet. They can be equipped with standard SC and LC connectors, Secure SC connectors, as well as with LC HD Push-Pull connectors. The Telenco® singlemode high capacity trunks are fully compliant with the IEC-61300 standard.

PN	Connector type	Fanout length	Fibre type	Fibre count	Diameter	Length	Weight
92881	SC/APC	1.0m	G.657A2	144FO	Ø 11.5mm	50.0m	5.00kg

The product's benefits:

+ Great capacity
+ Premium optical quality
+ 100% configurable
+ Reduced installation time
+ 100% dielectric
+ Gel free
+ Good mechanical performances

Available configurations:

SC/APC

SC/UPC

LC/APC

LC/UPC

Secure SC

LC HD Push-Pull

Colours:

Cable:

To be defined

Fan-out 1st level:

Fan-out 2nd level:

Fibre type: G.657A2, G.652D
Total length: from 3m to 300m
Fan-out length: from 0.3m to 2.5m
Fan-out: single or double level
Diameters: Ø 5mm to Ø 12.5mm

Parameter	Specifications
Fibre optic count	From 36 to 144FO
Flame retardant IEC 60332-1	100% compliant
Zero Halogen IEC 60754-2-1/-2	
Low Smoke IEC 61034-2-1/-2	
Cable material	LSZH (Low Smoke Zero Halogen)
Cable reinforcement material	Aramid yarns and/or FRP
Connector material	Body: thermoplastic / Ferrule: Zirconia
Cable diameter	Ø 5mm to Ø 12.5mm
Insertion Loss (IL)	Grade B ≤ 0.12dB on average and ≤ 0.25dB max for 97% of connections
Return Loss (RL)	≥ 60dB (APC) and ≥ 50dB (UPC)
Mechanical tests	Δ IL ≤ 0.20dB
Environmental tests	
Temperature	Operation, transport and storage: -40° C / +60° C

Telenco reserves the right to modify specifications without prior notice

Outdoor trunks

The Telenco® outdoor trunks facilitate the outdoor telecom networks cabling rollout. They are also optimised to interconnect the 4G/5G equipment (FTTA). Specifically designed to withstand harsh environments, they offer an increased protection against external mechanical, thermal, UV and rodent aggressions, while also maintaining a lightweight, yet very resistant structure. These trunks are available for capacities from 1 to 48FO and enable a quick connection between different equipment.

The Telenco® singlemode outdoor trunks are 100% configurable and can be pre-terminated at one or both ends. They have, as an option, a connector protection system, a pull ring and are supplied with a measurement sheet. They can be equipped with standard SC and LC connectors, Secure SC connectors, as well as with LC HD Push-Pull connectors.
The Telenco® singlemode outdoor trunks are fully compliant with the IEC-61300 standard.

PN	Connector type	Fibre type	Fibre count	Diameter	Length	Weight
92811	LC/UPC	G.657A2	24FO	Ø 11.5mm	30.0m	4.00kg

The product's benefits:

+ Resistant against external aggressions
+ Optimised for 4G/5G equipment (FTTA)
+ Premium optical quality
+ 100% configurable
+ Space saving
+ Reduced installation time
+ 100% dielectric
+ Gel free

Available configurations:

SC/APC

SC/UPC

LC/APC

LC/UPC

Secure SC

LC HD Push-Pull

Colours:

Cable: ●

Fan-out: ●

Fibre type: G.657A2, G.652D, G.657B3
Total length: from 2m to 300m
Fan-out length: from 0.3m to 2.5m
Diameters: Ø 4.8mm to Ø 12.5mm

Parameter	Specifications
Fibre optic count	From 1 to 48FO
Flame retardant IEC 60332-1	100% compliant
Zero Halogen IEC 60754-2-1/-2	
Low Smoke IEC 61034-2-1/-2	
Cable material	LSZH (Low Smoke Zero Halogen)
Cable reinforcement material	Aramid yarns and/or FRP
Connector material	Body: thermoplastic / Ferrule: Zirconia
Cable diameter	Ø 4.8mm to Ø 12.5mm
Insertion Loss (IL)	Grade B ≤ 0.12dB on average and ≤ 0.25dB max for 97% of connections
Return Loss (RL)	≥ 60dB (APC) and ≥ 50dB (UPC)
Mechanical tests	Δ IL ≤ 0.20dB
Environmental tests	
Temperature	Operation, transport and storage: -40° C / +75° C

Telenco reserves the right to modify specifications without prior notice

OPTICAL PATCH PANELS

19″ Sliding patch panels

The Telenco® singlemode sliding patch panels have been engineered specifically for fibre optic network applications (19″ or ETSI racks). Thanks to their intuitive design and ergonomics, the Telenco® singlemode sliding patch panels are easy to install solutions. Their retaining system offers an easy access to pigtails during connection applications.

The Telenco® singlemode sliding patch panels enable fusion splicing and cross-connection applications. They are equipped with factory pre-assembled pigtails, optical connectors, splicing trays and accessories (cage nuts and screws, heat-shrinkable splice protection sleeves, Rilsan cable ties). They are ready to be installed and do not require addition material to be ordered. The Telenco® singlemode sliding patch panels are made of corrosion-resistant treated steel.

The product's benefits:
+ High-end optical quality
+ Corrosion-resistant treated steel
+ Easy to install
+ All equipped
+ 100 % configurable
+ Made in Europe, in our production unit

They are available in various sizes and versions:
- 1U and 2U sliding patch panels
- Sliding patch panels - splicing applications
- Sliding patch panels - trunk version
- Sliding patch panels - splitter version

Sliding patch panels in splitter version can accommodate up to 64 standard SC connectors, 12 fusion splices and optical splitters with the following ratios 1:2, 1:4, 1:8, 1:32, 1:64 and the 2xN versions.

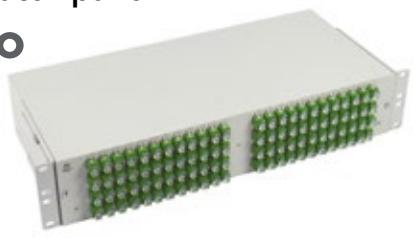
In 1U version, they can accommodate up to 48 standard SC connectors, 48 pigtails and 2 splice trays of 24 splices each, hence a total capacity of 48 splices. In 2U version, they can accommodate up to 96 standard SC connectors, 96 pigtails and 4 splice trays of 24 splices each, hence a total capacity of 96 splices.

The Telenco® singlemode sliding patch panels are fully compliant with the IEC-61300 standard.

1U Sliding patch panel

PN 15411

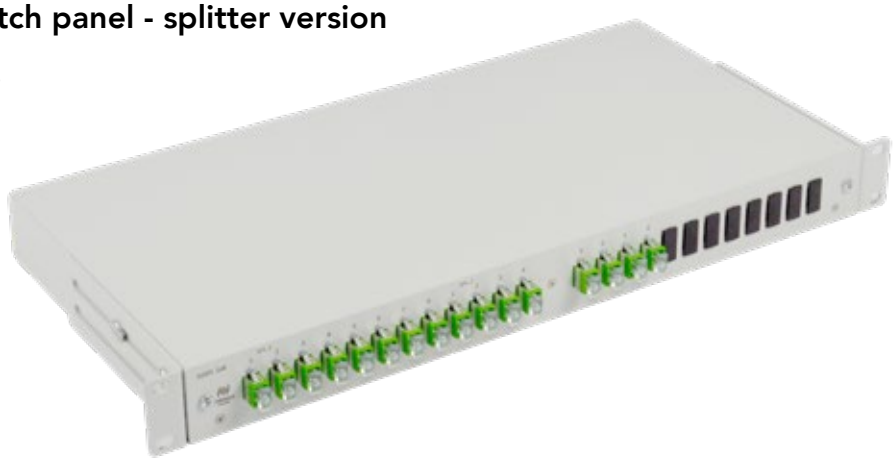
2U Sliding patch panel



PN 92589

PN	Format	Height	Version	Connector type	Fibre type	Fibre count	Weight
15411	19″	1U	Splicing	SC/APC	G.657A2	24FO	2.50kg
92589		2U				96FO	3.50kg

1U Sliding patch panel - splitter version



PN	Format	Height	Version	Splitting ratio	Number of splitters	Connector type	Fibre type	Weight
92882	19″	1U	Splitter version	1:8	2	SC/APC	G.657A2	2.50kg

Available configurations:

Colours:
Patch panel:

Pigtail (Orange™ colour code):

Fibre type: G.657A2, G.652D
Standard connectors for 1U and 2U versions: SC/APC, SC/UPC, LC/UPC, LC/APC, FC/UPC
Standard connectors for splitter version: SC/APC, SC/UPC, LC/UPC, LC/APC

SC/APC | SC/UPC | LC/APC | LC/UPC | FC/UPC

Technical specifications:

Parameter	Specifications
Patch panel material	Corrosion-resistant treated steel
Patch panel colour	Grey
Dimensions (L x W x H)	1U version: 201mm x 482mm x 44mm 2U version: 201mm x 482mm x 88mm
Optical equipment	« Splicing » version: factory assembled optical connectors and pigtails « Trunk » version: factory assembled optical connectors « Splitter » version*: factory assembled optical connectors and splitters
Splice trays	24 splices per splice tray
Fibre optic count	1U version: 6FO, 12FO, 24FO, 36FO, 48FO 2U version: 48FO, 72FO, 96FO
Included accessories	Cage nuts and screws, heat-shrinkable splice protection sleeves, Rilsan cable ties
Patch panel protection	Cardboard packaging with cardboard lining and buffers

*For splitter specifications, see pages 30-32

Optical specifications:

Parameter	Specifications
IEC-61300	100% compliant
Connector material	Body: thermoplastic Ferrule: Zirconia
Cable material	LSZH (Low Smoke Zero Halogen)
Pigtail length	2.5m
Insertion Loss (IL)	Grade B ≤ 0.12dB on average and ≤ 0.25dB max for 97% of connections
Return Loss (RL)	≥ 60dB (APC) and ≥ 50dB (UPC)
Mechanical tests	Δ IL ≤ 0.20dB
Environmental tests	
Temperature	Operation, transport and storage: -40° C / +75° C

Telenco reserves the right to modify specifications without prior notice

19" Pivoting patch panels

Telenco® modular pivoting patch panels are specifically designed for fibre optic patching applications within FTTH networks. Mainly intended for street cabinets and open chassis, their design allows them to be used in structures with a depth of 300mm.

These patch panels can also be installed in conventional racks. The Telenco® modular pivoting patch panels are equipped with assembled pigtails and connectors, as well as with splice trays and accessories (cage nuts and screws, heat-shrinkable splice protection sleeves, Rilsan cable ties). They are ready to be installed and do not require additional material to be ordered.

The product's benefits:

+ High-end optical quality
+ Corrosion-resistant treated steel
+ Easy to install
+ Bending radii compliance
+ Recessed front panel for optimised cord management
+ Front side cord protection panel
+ Made in Europe, in our production unit

Telenco® modular pivoting patch panels open to the left by pivoting (right pivoting on request), offering a full access to the rear of the patch panel and to splice trays while also enabling the patchcords to remain connected. Access to the optical cables is made on the side of the rotation axis support, with securing devices for tubes and optical cables.

The Telenco® modular pivoting patch panels present a recessed front panel, to optimise the management of patchcords, and a protective cover panel on the front side of the horizontal pivoting patch panel. The identification labels are visible from the the protective cover panel. This allows a quick and easy identification without the need of handling the patchcords and therefore, with zero risk of damaging them.

The Telenco® modular pivoting patch panels are made of corrosion-resistant treated steel.

They are available in various sizes and versions:
- 1U, 2U and 3U pivoting patch panels - splitter version
- 1U, 2U and 3U pivoting patch panels - for splicing applications version

The splitter versions can accommodate:
- Up to 128 standard SC connectors, 12 splices and optical splitters with ratios 1:2, 1:4, 1:8, 1:16, 1:32, 1:64 and the 2xN versions.

The versions for splicing applications can accommodate:
- For the 1U version: up to 48 standard SC connectors, 48 pigtails and 2 splice trays of 24 splices each, hence a total capacity of 48 splices.
- For the 2U version: up to 96 standard SC connectors, 96 pigtails and 4 splice trays of 24 splice each, hence a total capacity of 96 splices.
- For the 3U version: up to 144 standard SC connectors, 144 pigtails and 6 splice trays of 24 splices each, hence a total capacity of 144 splices.

The Telenco® modular pivoting patch panels are fully compliant with the IEC-61300 standard.

1U Pivoting patch panel

PN 91098

2U Pivoting patch panel

PN 91100

3U Pivoting patch panel

PN 91101

PN	Format	Height	Version	Connector type	Fibre type	Fibre count	Opening direction	Weight
91098	19"	1U	Splicing	SC/APC	G.657A2	48FO	Left side	2.80kg
91100		2U				96FO		5.60kg
91101		3U				144FO		8.40kg

1U/2U/3U Pivoting patch panel - splitter version

Telenco

PN 92917

PN	Format	Height	Version	Splitting ratio	Number of splitter	Connector type	Fibre type	Opening direction	Weight
92883	19"	1U	Splitter	1:32	2	SC/APC	G.657A2	Right side	2.00kg
92884		2U			4				2.50kg
92917		3U							2.80kg

Available configurations:

SC/APC

SC/UPC

LC/APC

LC/UPC

Colours:

Patch panel:

Pigtail (Orange™ colour code):

Fibre type: G.657A2, G.652D

Splitting ratio: 1:2, 1:4, 1:8, 1:16, 1:32, 1:64, 1:128, 2:N

Technical specifications:

Parameter	Specifications
Patch panel material	Corrosion-resistant treated steel
Patch panel colour	Grey
Dimensions (L x W x H)	1U version: 270mm x 482mm x 44mm 2U version: 270mm x 482mm x 88mm 3U version: 270mm x 482mm x 132mm
Optical equipment	« Splicing » version: factory assembled optical connectors and pigtails « Splitter » version*: factory assembled optical connectors and splitters
Splice trays	24 splices per splice tray
Fibre optic count	1U version: 6FO, 12FO, 24FO, 36FO, 48FO 2U version: 72FO, 96FO 3U version: 144FO
Included accessories	Cage nuts and screws, heat-shrinkable splice protection sleeves, Rilsan cable ties
Patch panel protection	Cardboard packaging with cardboard lining and buffers

*For splitter specifications, see pages 30-32

Optical specifications:

Parameter	Specifications
IEC-61300	100% compliant
Connector material	Body: thermoplastic / Ferrule: Zirconia
Cable material	LSZH (Low Smoke Zero Halogen)
Pigtail length	2.5m
Insertion Loss (IL)	Grade B ≤ 0.12dB on average and ≤ 0.25dB max for 97% of connections
Return Loss (RL)	≥ 60dB (APC) and ≥ 50dB (UPC)
Mechanical tests	IL ≤ 0.20dB
Environmental tests	
Temperature	Operation, transport and storage: -40° C / +75° C

Telenco reserves the right to modify specifications without prior notice

SPLITTERS

Singlemode PLC splitters

The Telenco® singlemode PLC splitters benefit from the chip-based planar technology. This technology is based on silicon microchips presenting microgrooves and forming a waveguide network. It guarantees a very high stability in the full operating wavelength range included from 1260 to 1660nm.

The Telenco® singlemode PLC splitters are the main components of FTTx/PON (Passive Optical Network) and CATV (Community Antenna Television). They are easy to install on splice trays, in optical patch panels or inside splice protection boxes. They are used to divide an optical signal at the splitter's input towards several fibres, at the splitter's output.

The Telenco® singlemode PLC splitters offer excellent optical performances. They are available for splitting ratios of 1:2, 1:4, 1:8, 1:16, 1:32, 1:64, 1:128 and the 2xN variants in different versions:

- Singlemode PLC splitter Ø 250µm
- Singlemode PLC splitter Ø 900µm
- Singlemode PLC splitter Ø 1.6mm

The Telenco® singlemode PLC splitters are fully compliant with the IEC-61300 standard.

The 2xN splitters

The 2xN splitters perform the same function as 1xN splitters, except that the coupling is made with two input fibres instead of one.

This provides a test port in an installation without having to disconnect and interrupt the traffic on the line.

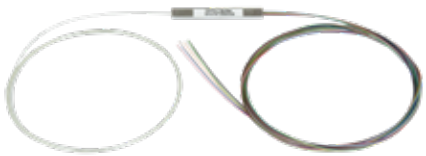
The 2xN splitters also allow two signals to be mixed. For instance, the TV signal and the Internet signal in the case of FTTH networks.

The product's benefits:

+ Compact and rugged construction
+ Excellent optical performances
+ Wide range offering multiple solutions
+ 100% configurable inputs and outputs

Splitter Ø 250µm

Telenco



PN 09996

Splitter Ø 900µm

Telenco

PN 09759

Splitter Ø 1.6mm

Telenco

PN 15817

PN	Splitting ratio	Box dimensions	Connector type	Fibre type	Diameter	Length	Weight
09996	1:8	40 x 4 x 4mm	Bare	G.657A2	Ø 250µm	2.5m	0.03kg
09759		60 x 7 x 4mm	Bare-SC/APC		Ø 900µm	1.5m	0.11kg
15817		100 x 45 x 10mm	SC/APC-SC/APC		Ø 1.6mm		0.17kg

Available configurations:


SC/APC


SC/UPC


LC/APC


LC/UPC

Technical specifications for 1xN splitters:

Parameter		Specifications						
Splitting ratio		1:2	1:4	1:8	1:16	1:32	1:64	1:128
Box material	**Ø 250µm Ø 900µm**	Stainless steel						
	Ø 1.6mm	ABS						
Box dimensions (L x W x H)	**Ø 250µm**	40 x 4 x 4			50 x 4 x 4	50 x 7 x 4	60 x 12 x 4	
	Ø 900µm	60 x 7 x 4			60 x 12 x 5	80 x 20 x 6	100 x 40 x 6	
	Ø 1.6mm*	100 x 80 x 10					100 x 80 x 20	100 x 80 x 20
Operating wavelength		1260 to 1660nm						
Insertion Loss (IL) (dB)		≤ 3.8	≤ 7.1	≤ 10.4	≤ 13.7	≤ 17.0	≤ 20.3	≤ 22.7
Return Loss (RL) (dB)		≥ 55						
Polarization Dependent Loss (PDL) (dB)		≤ 0.2	≤ 0.2	≤ 0.3	≤ 0.3	≤ 0.4	≤ 0.4	≤ 0.5
Uniformity (dB)		≤ 0.5	≤ 0.9	≤ 1.3	≤ 1.7	≤ 2.1	≤ 2.5	≤ 2.5
Directivity (dB)		≥ 55						

Technical specifications for 2xN splitters:

Parameter		Specifications					
Splitting ratio		2:2	2:4	2:8	2:16	2:32	2:64
Box material	**Ø 250µm Ø 900µm**	Stainless steel					
	Ø 1.6mm	ABS					
Box dimensions (L x W x H)	**Ø 250µm**	40 x 4 x 4			50 x 4 x 4	50 x 7 x 4	60 x 12 x 4
	Ø 900µm	60 x 7 x 4			60 x 12 x 5	80 x 20 x 6	100 x 40 x 6
	Ø 1.6mm*	100 x 80 x 10					100 x 80 x 20
Operating wavelength		1260 nm à 1660 nm					
Insertion Loss (IL) (dB)		≤ 4.1	≤ 7.5	≤ 10.9	≤ 14.3	≤ 17.7	≤ 21.1
Return Loss (RL) (dB)		≥ 55					
Polarization Dependent Loss (PDL) (dB)		≤ 0.3	≤ 0.3	≤ 0.4	≤ 0.4	≤ 0.5	≤ 0.5
Uniformity (dB)		≤ 0.9	≤ 1.4	≤ 1.9	≤ 2.4	≤ 2.9	≤ 3.4
Directivity (dB)		≥ 55					

*Other box sizes are available on request

Optical specifications of 1xN and 2xN splitter connectors:

Parameter		Specifications
IEC-61300		100% compliant
Fibre type		G.657A1, G.657A2
Fibre colours*	**Ø 250µm** **Ø 900µm**	Input: White Output: ISO colour code
	Ø 1.6mm	Input: Orange Output: Yellow
Fibre dimensions	**Length**	Input and output: 0.5m to 3m
	Diameter	Ø 250µm, Ø 900µm, Ø 1.6mm
Connector type	**Ø 250µm**	Bare-Bare
	Ø 900µm	Bare-SC/APC, Bare-SC/UPC, Bare-LC/UPC, Bare-LC/APC, SC/APC-SC/APC, LC/APC-LC/APC
	Ø 1.6mm	SC/APC-SC/APC
Splitting ratio		1:2, 1:4, 1:8, 1:16, 1:32, 1:64, 1:28 2:2, 2:4, 2:8, 2:16, 2:32, 2:64
Additional Insertion Loss per connector (IL) (dB)		Grade B ≤ 0.12dB on average and ≤ 0.25dB max for 97% of connections
Return Loss (RL) (dB)		≥ 60dB (APC) and ≥ 50dB (UPC)
Temperature		Operation, transport and storage: -40° C / +85° C

*The colours of input and output fibres are configurable on request
Telenco reserves the right to modify specifications without prior notice

ADAPTORS AND ATTENUATORS

Adaptors

The Telenco® singlemode adaptors enable the coupling of fibre optic connectors. They are equipped with a high precision ceramic sleeve and offer excellent optical performances.

The Telenco® singlemode adaptors are available in different versions:

Telenco

Simplex
SC/APC

Simplex
SC/UPC

Duplex
LC/APC

Duplex
LC/UPC

Simplex
FC/UPC

PN	Connector type	Clip	Tab	Weight
92557	Simplex SC/APC	With	With	0.004kg
92523		With	Without	
90555		Without	Without	
93230	Simplex SC/UPC	With	With	
93229		With	Without	
90957		Without	Without	
92887	Duplex LC/UPC	With	With	
92888		With	Without	
92889		Without	Without	
92890	Duplex LC/APC	With	With	
92891		With	Without	
92892		Without	Without	
92524	FC/UPC	To screw		0.009kg

The product's benefits:

+ High precision ceramic sleeve
+ Great interoperability
+ Easy to install
+ Excellent mechanical and temperature stability

Characteristics:

Fibre type: Singlemode

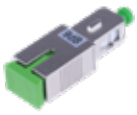
Parameter	Specifications
IEC-61300	100% compliant
IEC-61274	
Flame retardant IEC 60332-1	
Sleeve material	Ceramic
Number of connections	≥ 500
Insertion Loss (IL)	≤ 0.15dB

Telenco reserves the right to modify specifications without prior notice

Male/female attenuators

The Telenco® singlemode attenuators are used with fibre optic equipment and cables to reduce the light power of the optical signal. This allows to avoid any risk of damage to measurement devices or active equipment. In male/female format, they are to be fixed directly between the ferrules and the optical connectors.

The Telenco® singlemode attenuators are available in different versions:


SC/APC


SC/UPC

LC/APC

LC/UPC

PN	Connector type	Attenuation	Weight
13517	SC/APC	5dB	0.004kg
13519		10dB	
13520		15dB	
15115	SC/UPC	5dB	
15114		10dB	
91936		15dB	
10240	LC/UPC	5dB	0.011kg
13341		10dB	
10239		15dB	

The product's benefits:

+ High precision ceramic
+ Great interoperability
+ Easy to install
+ Excellent mechanical and temperature stability

Characteristics:

Fibre type: Singlemode

Parameter	Specifications
Operating wavelength	1260nm to 1640nm
Attenuation range (IL)	1- 30dB
Attenuation allowance (IL)	0-4dB:+/-0.50dB 5-30dB: +/-10 % x attenuation
Return Loss (RL)	≥ 60dB (APC) and ≥ 50dB (UPC)
Mechanical tests	Δ IL ≤ 0.20dB
Environmental tests	
Temperature	Operation: -40° C / +75° C Transport and storage: -40° C / +85° C

Telenco reserves the right to modify specifications without prior notice

Bare fibre adaptors

The Telenco® singlemode bare fibre adaptors are used in optical networks and optical production units. They are particularly suitable for situations where a quick and easy connection of the bare fibre to the optical equipment is required.

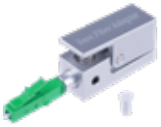
They are mainly used to perform optical measurements on disconnected or cut cables. Users can thus interconnect equipment without having the need to connect bare fibres by using fusion splicing applications.

The Telenco® singlemode bare fibre adaptors are available in various versions:

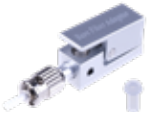
Telenco


SC/APC


SC/UPC


LC/APC


LC/UPC


ST/UPC


FC/UPC

PN	Type	Colour	Weight
92360	SC/APC	Green	0.01kg
92359	SC/UPC	Blue	
92676	LC/APC	Green	
92675	LC/UPC	Blue	
92936	ST/UPC	-	
92677	FC/UPC	-	

The product's benefits:

+ Rugged construction adaptor
+ Reduced insertion loss
+ Lightweight and compact
+ Quick and easy connections on jobsite

Characteristics:

Fibre type: Singlemode

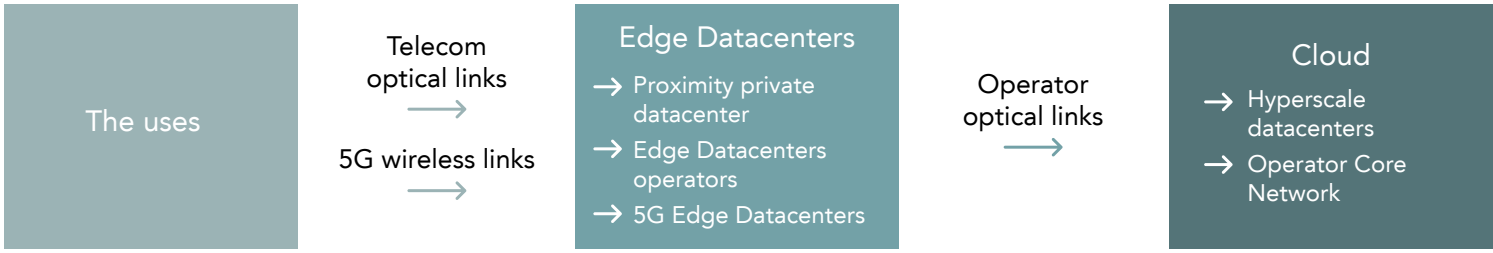
Parameter	Specifications					
Connector type	SC/APC	SC/UPC	LC/UPC	LC/APC	ST/UPC	FC/UPC
IEC-61300	100% compliant					
Ferrule's inner diameter	125 - 127µm					
Ferrule's outer diameter	2.49mm		1.25mm		2.49mm	
Number of connections	≥ 1000					
Insertion Loss (IL)	< 0.20dB					
Repeatability	< 0.20dB					
Temperature	Operation: -40° C / +80° C					

Telenco reserves the right to modify specifications without prior notice

Datacenter networks

The development of 5G and its densified network, the increasing need for higher data rates and low latency, as well as the security and data governance leads to a need for processing information flows at a local level.

Edge datacenters are a first response for applications that require almost immediate response times. By placing the computing power at the edge of the network, operators are able to drastically reduce latency to below 1 ms and improve the digital user experience. Combined with smart cities, edge datacenters should enable an ethical and secure management of public and private data.



What is a datacenter?

It is an infrastructure consisting of a computer network and storage spaces. This infrastructure can be used to organise, process and store large data volumes.

The main components of a datacenter are:

- **Power, secure and redundant**
- **Cooling, redundant and optimised**
- **Physical and IT security**
- **Computer racks or corridors**
- **Service networks (related to the management and security)**
- **Telecom/ IT data networks**

It is economically obvious that with regard to the territory, proximity shared centers hosting multi-operator networks, computing power and storage will emerge.
This pooling of networks is concentrated in the Meet Me Rooms, where density and modularity are significant characteristics of the development of Edge Datacenters.

Raising the challenges of the Meet Me Rooms

Meet-Me-Rooms are the nerve centres in the architecture of datacenter networks. These strategic physical facilities host different services corresponding to one or more telecom operators and service providers.

To exchange information, datacenters and enterprises use Meet-me-Rooms (MMR) to create inter-rack or inter-equipment links so to connect to one or several operators.

For this reason, it is extremely important to secure both the access to the location and the connections that are activated within the given space at the moment of setting up a MMR. Any initial or further development must be carefully considered so to comply with the established engineering rules and thus reinforce reliable and sustainable infrastructures.

Telenco networks' engineers and designers are aware of the critical importance of the hardware to be installed in MMRs. The connectivity offer marketed by Telenco networks includes only high-end products, specifically designed to meet the challenges of datacenters and Meet-Me-Rooms.

As concrete solutions for meeting the lack of space in MMR and anticipating the evolution of infrastructures, our connectivity products offer a compact design and carefully engineered ergonomics.

To provide a reliable and future-proof response to these challenges, Telenco networks and Huber+Suhner® are combining their expertise and dual skills: Datacenter and Telecom.

MMR

LISA system

Multi-network modular
high density
LC/MTP®/MPO/SC

PRE-TERMINATED LINKS

LC = LC or SC

MTP®/MPO - LC or SC

MTP®/MPO - MTP®/MPO

RACKS

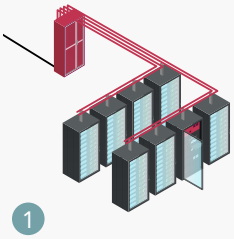
IANOS system
Modular high density
LC/MTP®/MPO/SC

Modular medium density

Low density LC or SC

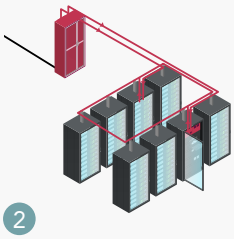
The distribution architecture

Various architectures are possible in proximity datacenters or Edge datacenters, depending on the size, use and the format of these latter ones. The solutions offered by Telenco networks are suitable to an integration into any distribution architecture in proximity or edge datacenters.



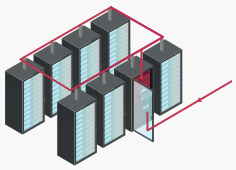
1

Direct distribution
- Meet Me Room (MMR)
- Pre-terminated and half pre-terminated links
- Patching system in racks



2

Indirect distribution
- MMR
- Pre-terminated and half pre-terminated links
- MMR/CR in a row
- Pre-terminated and half pre-terminated links
- Patching system in racks



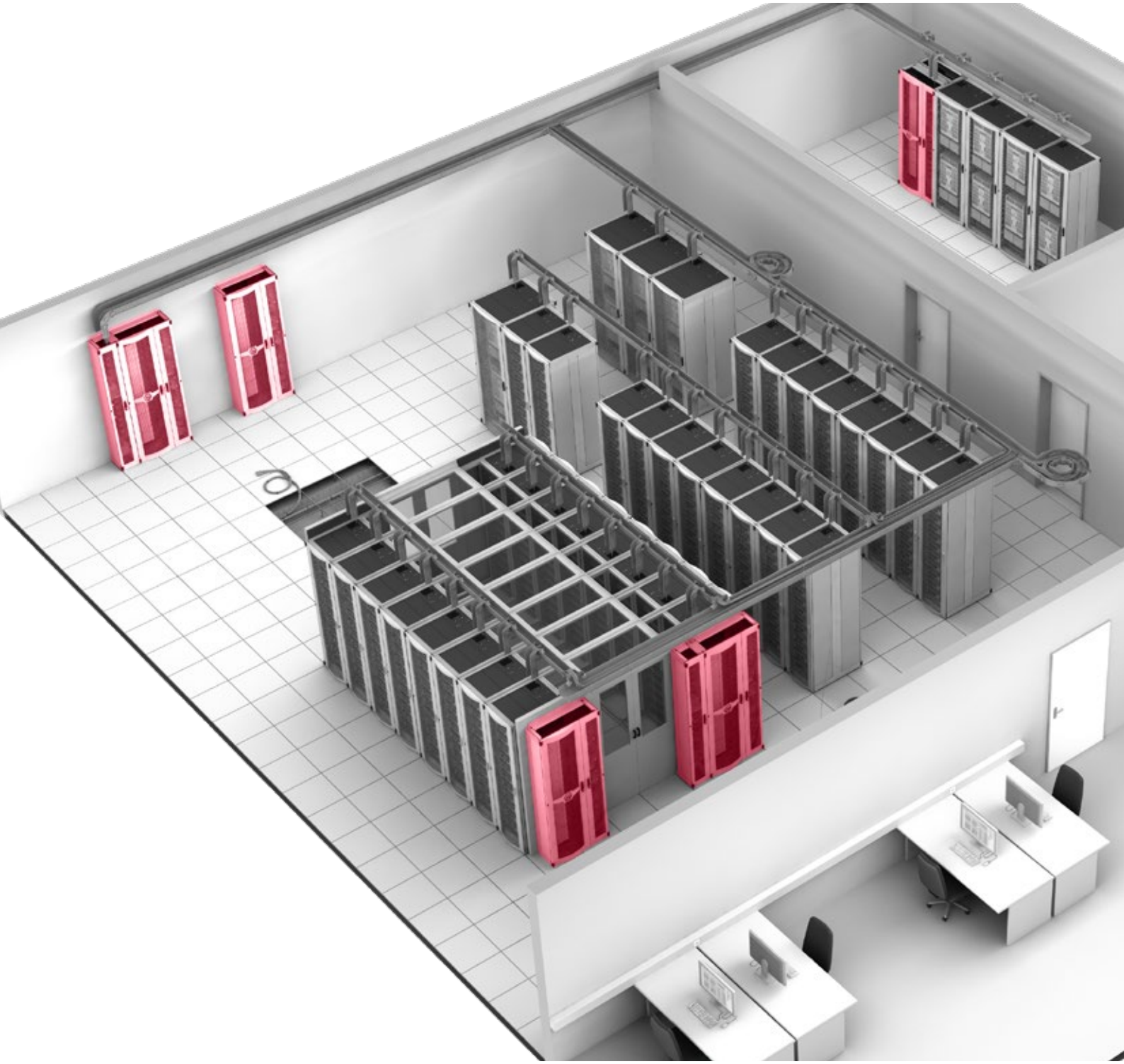
3

MR in a row
- MMR/CR in a row
- Pre-terminated and half pre-terminated links
- Patching system in racks

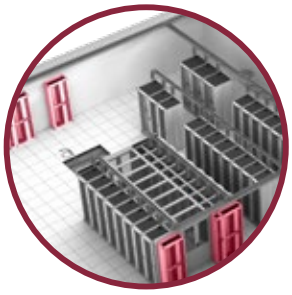
In partnership with Huber+Suhner®, Telenco networks offers a full range of products or connectivity solutions for datacenter and enterprise networks and particularly for the following environments:

- **Meet-Me-Room**
- **Optical distribution**
- **Optical cabling for racks**

MEET-ME-ROOM



19" LISA solution



47U LISA Racks

MMR (Meet-Me-Room) **MDA (Main Distribution Area)**	Main distribution area of datacenters' optical networks

The product's benefits:

+ Multi-network modular high density
+ 100% dedicated solution to MMR and MDA optical networks
+ Congestion optimization: 300mm depth, front side full fibre access
+ Easy and quick installation
+ Scalability: easy capacity increase and connectivity change
+ Integrated management of cable slack thanks to largely dimensioned coiling areas
+ Excellent fibre routing with bending radii protection
+ Easy assembly and disassembly of doors and side panels

The Huber+Suhner® LISA racks are high density fibre optic management systems.

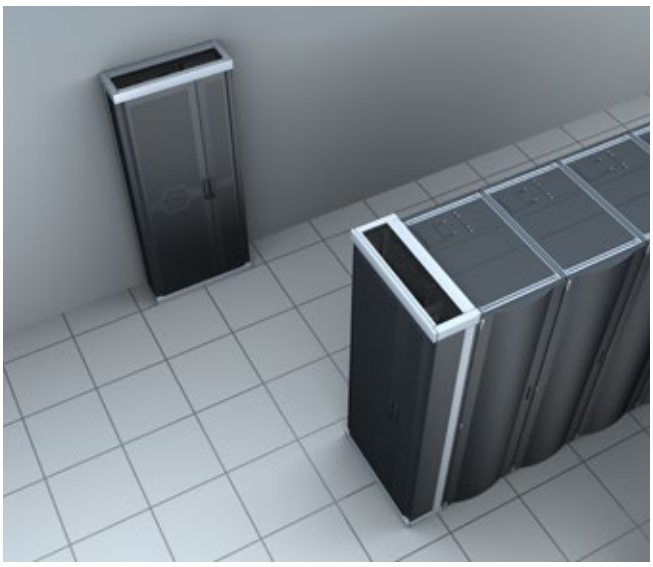
They have been specifically designed to meet all the requirements of Meet-Me-Room (MMR) or Main Distribution Area (MDA) of datacenters requiring high density patching and a significant need for scalability.

With a depth of only 300mm and offering a full access from the front side, the Huber+Suhner® LISA racks can be placed at the head of a row, back-to-back (on a single floor slab) or against a wall for a minimum power consumption. They can also be assembled side by side to easily increase the patching capacity. Thanks to this space optimization, they can be easily positioned within the datacenter and allow the management of a maximum fibre count in the smallest possible space.

The Huber+Suhner® LISA racks are available in 900mm and 1200mm wide versions. Indeed, for a better cable management, an add-on stand-alone rack of 300mm wide can be provided to offer an additional fibre management and coiling space. It can be used in combination with a 900mm rack to create a 1200mm wide rack, or separately for cable storage applications.

The Huber+Suhner® LISA racks are the most flexible and scalable fibre management system available on the market. They present large openings for all types, sizes and quantities of cables and a lightweight 2-post design for a better access to these latter ones. Their doors and side panels can be quickly assembled and disassembled, without tools.

Users benefit of large coiling areas. All internal components can be installed and are accessible from the front side. The racks can be thus installed easily and quickly.



The Huber+Suhner® LISA racks are equipped with an integrated cable slack management system for routing and managing extra cable lengths. Moreover, this management method reduces the number of cable lengths required to enable connections. Only two lengths of cable are needed to connect any port of a LISA rack.

To meet the needs, cassettes can be added or modified. They present two opening versions (horizontal and vertical), which makes the access to fibres, patchcords and splice cassettes' trunks very simple and without risk for the fibres of other cassettes. Likeways, adding or removing cassettes is extremely simple and presents no risk for the active links.

Cassettes are identified by a triple labelling, with a double identification: colours and text. This clear and quickly visible labelling system helps reducing installation and service times and have a significant impact on the operational costs of the datacenter. Different types of connectors, fibres and applications can be mixed within the same rack. The Huber+Suhner® LISA racks can accommodate up to 1620 Duplex LC ports (3240 fibres) and up to 1080 MTP®/MPO ports (25,920 fibres).

Depending on the requirements, the Huber+Suhner® LISA solution can be easily configured by selecting the following elements:

- Distribution racks 900 or 1200mm wide
- Tray units in 2U, 3U, 6U and 7U versions
- Cassettes in Patching, Splicing or Transition versions

These innovations make the Huber+Suhner® LISA solution perfectly suitable to the modularity and scalability needed to support the growth and evolution of datacenters.

LISA 47U Distribution rack

HUBER+SUHNER

PN	Size	Height	Dimensions	Colour	Weight
91452	19"	47U	900x300mm	Noir	123.40kg

LISA 47U Extension distribution rack

HUBER+SUHNER

PN	Size	Height	Dimensions	Colour	Weight
91453	19"	47U	300x300mm	Noir	56.30kg

Technical specifications:

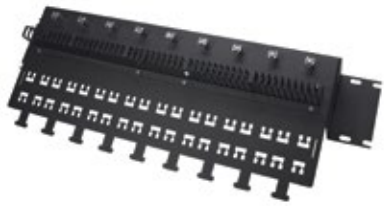
Parameter		Specifications	
Rack type		Distribution rack 900x300mm	Extension distribution rack 300x300mm
RoHS directive 2002/95/EC		100% compliant	
REACH standard			
Ingress Protection		IP30	
Flammability rating		UL 94 V-0	
UV resistance		Yes	
Chemical resistance			
Halogen free			
Structure	Material	Aluminum	
	Colour	Silver	
Panels	Material	Metal sheet	
	Colour	Black	
Dimensions (D x W x H)		300mm x 900mm x 2200mm	300mm x 300mm x 2200mm
Weight		123.40kg	56.30kg
Optical capacities		LC: 1620 ports, 3240 fibres MTP®: 1080 ports, 25,920 fibres	-
Temperature		Operation, transport and storage: -46° C / +81° C	

Telenco reserves the right to modify specifications without prior notice

LISA Accessories

19" Cable mounting bracket

HUBER+SUHNER



PN	Designation	Weight
91454	19" Cable mounting bracket 10x Black cables	1.35kg

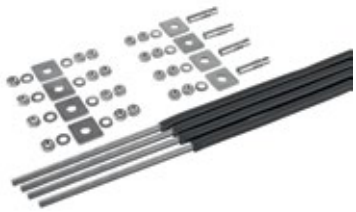
Cover for 19" cable mounting bracket

HUBER+SUHNER

PN	Designation	Weight
91447	Cover for 19" cable mounting bracket 10x Black cables	0.40kg

Mounting kit for false floor

HUBER+SUHNER



PN	Designation	Weight
92202	LISA mounting kit for false floor	2.70kg

FO Protective tube Ø 5mm

HUBER+SUHNER

PN	Designation	Weight
92042	FO tube protection Ø 5mm Black 100m	1.80kg

LISA Tray unit

The Huber+Suhner® LISA tray units are high-density fibre optic management sub-assemblies. Located inside the Huber+Suhner® LISA racks, they can accommodate Splicing, Patching or Transition cassettes and, on request, Splitter or WDM cassettes.

The Huber+Suhner® LISA tray units are compatible with LC, SC and MTP® cassettes. This enables the upgrade of the equipment. This allows the equipment to be upgraded, as for instance switching to a network based on MTP® connectors all while preserving the same installation.

Likewise, singlemode and multimode cassettes can be mixed, providing for flexibility and scalability.

The product's benefits:

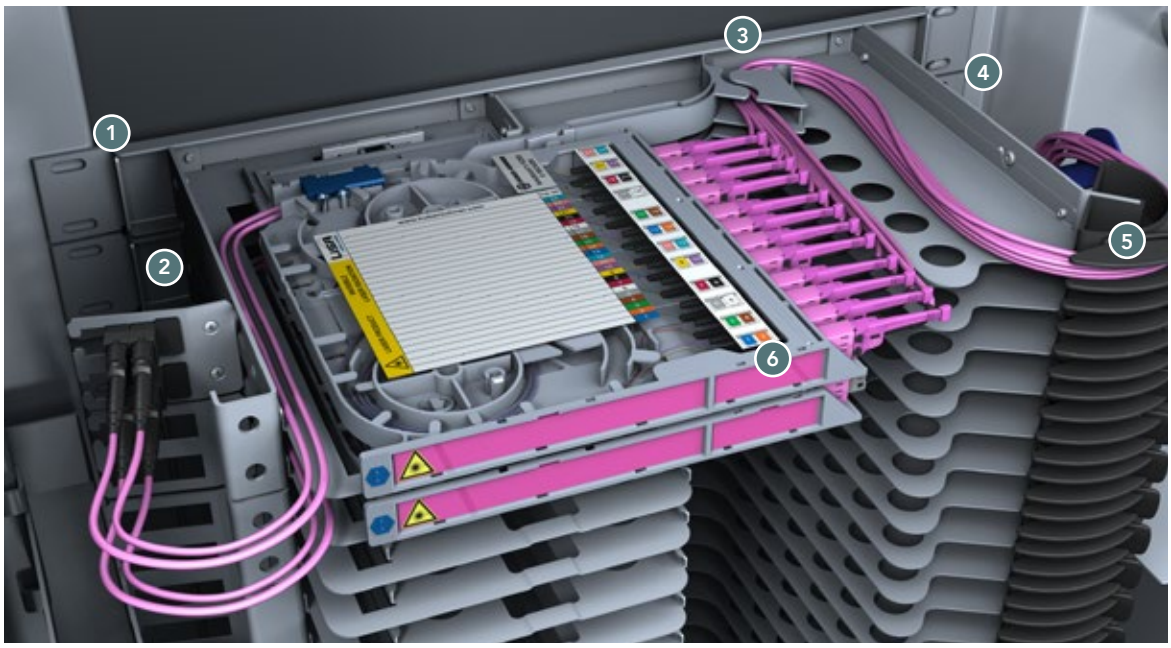
+ Secure : Independant fibre flow using splice cassettes
+ Scalability : 4 tray units heights (2U, 3U, 6U, 7U)
+ Quick and easy tray unit installation on the rear post
+ Secure patchcord routing and bending radius compliance

Thanks to their full front accessibility, the Huber+Suhner® LISA tray units allow for easy installation, space saving, secure fibre management and optimised working space. Installation and maintenance are carried out from the from side, so there is no need to access the rear side of the LISA rack, nor have to be equipped with special tools.

To adapt to all possible configurations, the Huber+Suhner® LISA tray units are available in LC versions:

- 2U: 4 LISA cassettes and up to 144 fibres
- 3U: 5 LISA cassettes and up to 216 fibres
- 6U: 12 LISA cassettes and up to 432 fibres
- 7U: 15 LISA cassettes and up to 540 fibres

The interconnection system of a tray unit



1. Mounting on the rear post allows to free up space for the management of the rack from its front side
2. Mounting plate for retubing sheaths or MTP® connectors for pre-terminated links
3. Secure routing of optical patchcords for an easy handling of cassettes
4. Securing bending radii
5. Clip for the retention of optical patchcords
6. Up to 36 fibres per cassette, i.e. 72 fibres/U

19" LISA Patching tray unit

HUBER+SUHNER

PN 92345

PN	Height	Slot number	Colour	Weight
91974	2U	4	Black	2.50kg
92937	3U	6		3.80kg
92938	6U	12		7.60kg
92345	7U	15		9.10kg

19" LISA Splicing/Transition left tray unit

HUBER+SUHNER

PN 92043

PN	Height	Slot number	Colour	Weight
92939	2U	4	Black	2.30kg
92438	3U	6		3.50kg
92940	6U	12		7.00kg
92043	7U	15		8.60kg

Technical specifications:

Parameter		Specifications			
Height		2U	3U	6U	7U
RoHS directive 2002/95/EC		100% compliant			
REACH standard					
Halogen free		Yes			
Tray unit material	**Patching version**	Aluminum			
	Splicing/ Transition versions	Steel and aluminum			
Tray unit colour		Black			
Mandrels' material	**Front side**	ABS			
	Sideways	HDPE			
Mandrels' colour	**Front side**	Black			
	Sideways	Blue			
Tray unit dimensions (D x W x H)	**Patching version**	264 x 498 x 88mm	264 x 498 x 132mm	264 x 498 x 266mm	264 x 498 x 310mm
	Splicing/ Transition versions	264 x 501 x 88mm	264 x 501 x 132mm	264 x 501 x 266mm	264 x 501 x 310mm
Tray unit weight (kg)	**Patching version**	2.5kg	3.8kg	7.6kg	9.1kg
	Splicing/ Transition versions	2.4kg	3.5kg	7kg	8.6kg
Maximum number of cassettes		4	6	12	15
Temperature		Operation, transport and storage: -25° C / +70° C			

Telenco reserves the right to modify specifications without prior notice

LISA Cassette

The Huber+Suhner® LISA cassettes can be integrated into LISA tray units placed inside Huber+Suhner® LISA racks.

They are engineered for a quick installation : can be installed and removed in less than 10 seconds without interfering with the pre-installed fibres. LISA cassettes also offer an optimised accessibility and ensure that connections are secured sideways, presenting no risk to the front side, thanks to their lateral configuration.
The Huber+Suhner® LISA cassettes present 3 labels and a double identification system using colours and text. This clear and quickly visible labelling system helps reducing installation and service times and have a significant impact on the operational costs of the datacenter.

The Huber+Suhner® LISA cassettes are easy to identify and to access from the front side. Indeed, installation and maintenance can be carried out from the front side, so there is no need to access the rear side of the LISA rack, nor have to be equipped with special tools. Connections are performed sideways, which provides for a greater laser safety protection to users. This architecture also allows for the extraction and drawdown of cassettes with active fibres, without any risks for maintenance operations or for optical links add-on jobs.
The integrated sliding system (horizontal and vertical), as well as the self-locking one make the installation simple, fast and repeatable.

The Huber+Suhner® LISA cassettes are available to cover a wide range of applications: Patching (for connecting pre-terminated cables), Splicing (for connecting optical fibres by using splicing applications), Transition (for converting MTP® cables into Duplex LC and SC connectivity solutions).

The Huber+Suhner® LISA cassettes are available with various types of fibre optics (Singlemode and Multimode) and different connectors (LC, SC, MTP®). They exist in the following versions: 12FO (SC), 18FO (SC), 24FO (LC, MTP®) and 36FO (LC, MTP®).

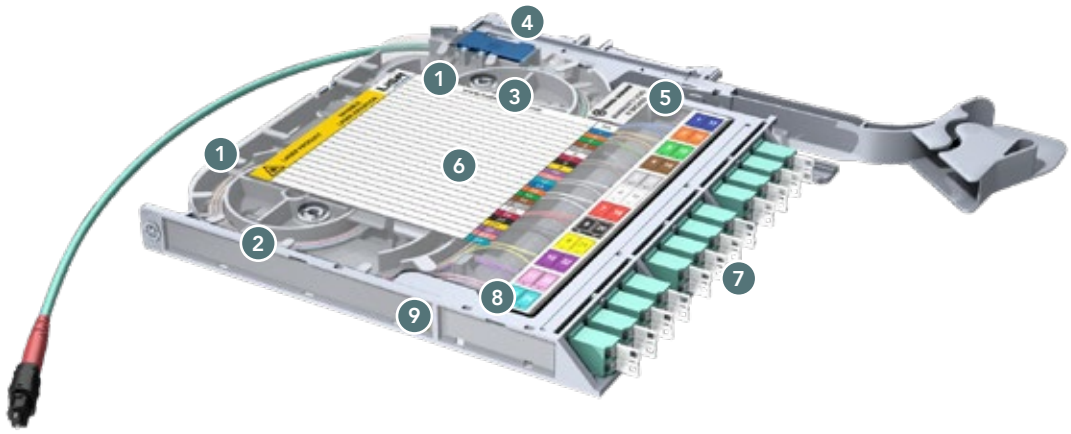
Regardless of the connection and application, Huber+Suhner® LISA cassettes can be installed and mixed within the same LISA rack. This makes it easy to change the cabling structure of the datacenter in the course of its growth, providing thus for a great flexibility and scalability.

The Huber+Suhner® LISA cassettes are designed for managing fibres in a secured and orderly manner, making no compromise for the user handling or optical performances. The guiding elements inside the cassette ensure the respect of the minimum bending radius of the fibres, as well as enough space between the incoming and outgoing fibre optics.

The product's benefits:

+ Modularity: Patching, Splicing, Transition
+ Flexibility: cassettes available in LC/SC/MTP®, singlemode or multimode versions
+ Scalability: possibility to add-on cassettes if needed
+ Easy access: 2 ways of opening cassettes
+ Optimised work space: full access to cassettes from the front side
+ Easy identification by colour and label system
+ Quick installation and easy handling without tools
+ Secured fibre routing respecting the bending radius

The interconnection system of a cassette



1. Storage area for fibre overlengths
2. Tabs for maintaining fibres (various lengths)
3. Storage of fibres pending connection
4. Cable attachment / Retubing sheath
5. Pigtail connection
6. Central area for splicing/ Fibre identification label with numbers and colours
7. Connector positioning (up to 36 optical paths)
8. Already stripped fibres
9. 2 areas for identification labels

LISA Patching cassette

HUBER+SUHNER

PN 50091

HUBER+SUHNER

PN 91973

PN	Connector type	Connector number	Fibre count	Weight
50091	Duplex LC/UPC	12	24	0.29kg
92941		18	36	0.31kg
91973	SC/APC	12	12	0.29kg
91972		18	18	0.31kg

Available configurations:

Duplex
LC/UPC

Simplex
SC/APC

Fibre type: Singlemode

Technical specifications:

Parameter		Specifications	
Type of cassette		LISA Transition cassette	
Compatible connectors		LC/UPC	SC/APC
Connectors colour		Blue	Green
Fibre optic count	**12 adaptors**	24	12
	18 adaptors	36	18
Weight	**12 adaptors**	0.29kg	
	18 adaptors	0.32kg	
Cassette dimensions (D x W X H)		241mm x 259mm x 19mm	
Cassette material		ABS/PC	
Cassette colour		Grey	
RoHS directive 2002/95/EC		100% compliant	
REACH standard			
Flammability rating		UL 94V-0	
UV resistance		Yes	
Chemical resistance			
Halogen free			
Temperature		Operation: -40° C/ +70° C	
Other versions available on request	**Singlemode**	LC/APC, SC/UPC, MTP®/APC	
	Multimode	LC/PC, SC/PC, MTP®/PC	

Telenco reserves the right to modify specifications without prior notice

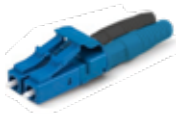
LISA Splicing cassette

PN	Fibre type	Fibre optic count	Pigtail colour code	Number of adaptors	Connector type	Weight
91450	G.652D	24	TIA	12	Duplex LC/UPC	0.61kg
92044		24	Monochrome		Duplex LC/UPC	0.61kg
91449		12	TIA		SC/APC	0.55kg

HUBER+SUHNER

PN 91450

Available configurations:



LC/UPC

SC/APC

Fibre type: Singlemode

Technical specifications:

Parameter		Specifications	
Type of cassette		LISA Splicing cassette	
Compatible connectors		LC/UPC	SC/APC
Connectors' colour		Blue	Green
Number of adaptors		12	
Fibre optic count		24	12
Pigtail colour code		TIA/ Monochrome	TIA
Weight		0.61kg	0.55kg
Cassette dimensions (D x W X H)		293mm x 262mm x 18mm	
Cassette material		ABS/PC	
Cassette colour		Grey	
RoHS directive 2002/95/EC		100% compliant	
REACH standard			
Flammability rating		UL 94V-0	
UV resistance		Yes	
Chemical resistance			
Halogen free			
Temperature		Operation: -40° C/ +70° C	
Other versions available on request	**Singlemode**	LC/APC, SC/UPC	
	Multimode	LC/PC, SC/PC	

Telenco reserves the right to modify specifications without prior notice

LISA Transition cassette

HUBER+SUHNER

PN 50090

HUBER+SUHNER

PN 92193

HUBER+SUHNER

PN 50089

HUBER+SUHNER

PN 92194

PN	Fibre type	Fibre optic count	Version	Number of adaptors	Connector type	Weight
50090	G.652D	24	MTA F24R1	12	Duplex LC/UPC	0.54kg
92193		24	2MTA M 12AS	12		
50089		24	3MTA F 8NS	12		
92194		36	3MTA M 12AS	18		

Available configurations:

MTP®/APC

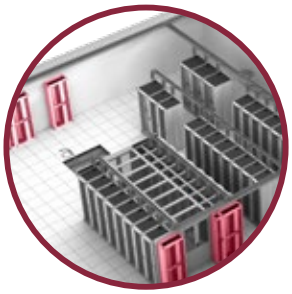
LC/UPC

Fibre type: Singlemode

Technical specifications:

Parameter		Specifications			
Type of cassette		LISA Transition cassette			
Compatible connectors		MTP®/APC-LC/UPC			
Version		1MTA F 24R1	2MTA M 12AS	3MTA F 8NS	3MTA M 12AS
Number of adaptors		12			18
Fibre optic count		24			36
Number of MTP® outputs		1	2	3	
MTP® connector type		MTP®/APC	MTP®/APC	MTP®/APC	MTP®/APC
Weight		0.50kg	0.54kg		
Cassette dimensions (D x W X H)		293mm x 262mm x 18mm			
Cassette material		ABS/PC			
Cassette colour		Grey			
RoHS directive 2002/95/EC		100% compliant			
REACH standard					
Flammability rating		UL 94V-0			
UV resistance		Yes			
Chemical resistance					
Halogen free					
Temperature		Operation: -40° C/ +70° C			
Other versions available on request	**Multimode**	MTP®/PC			

Telenco reserves the right to modify specifications without prior notice



19" High density IANOS solution

IANOS Chassis

The Huber+Suhner® IANOS chassis are high density fibre optic modular management systems allowing for quick and flexible fibre optic operations in datacenters. They fit into all standard 19" racks so to accommodate Patching modules (for connecting pre-terminated cables), Splicing modules (for connecting optical fibres by using splicing applications), Transition (to convert MTP® cables into Duplex LC and SC connectivity solutions).

Datacenters are constantly adapting to the demands placed on them and current fibre optic management systems have to meet these changes with a minimum of cost, time and network disruption. IANOS anticipates these evolutions by offering the most wide range of connectivity scenarios in a single generic platform.

The Huber+Suhner® IANOS chassis are available in 1U and 4U versions for high density applications.
In 1U and LC version, they can accommodate up to 12 modules and 144 fibres (72 ports) per rack unit.
In 4U and LC version, they can accommodate up to 48 modules and 576 fibres (288 ports) per rack unit.

Thanks to their modularity, the Huber+Suhner® IANOS chassis can also be used for networks based on MTP®/MPO connectors for 10G or 100G links.

The Huber+Suhner® IANOS chassis present 6 plates per rack unit, which can slide independently, and 2 front covers offering a full fibre protection, as well as wide identification areas. As needs may change, other modules can be added from the front or the back side. The Huber+Suhner® IANOS chassis are thus, evolving at the same pace with the datacenter.

It is possible to mix different modules within the same chassis depending on:
- Connectivity solutions (SC, LC or MTP®)
- Height (1U or 4U)
- Fibre optic types (Singlemode or Multimode)
- Applications (Patching, Splicing, Transition)

The position of the modules, as well as the position of the existing ports are clearly marked on the Huber+Suhner® IANOS chassis. A sliding label positioned at the center of the chassis offers additional information. This clear and quickly visible labelling system helps reducing installation and service times and have a significant impact on the operational costs of the datacenter.

The fibre routing in the front part of the chassis is clearly defined and independent, which allows for safe interventions on active fibres. This makes access to the patch cables quick and easy. At the rear, cable trays can be supplied together with the Huber+Suhner® IANOS chassis so to ease the securing and management of fibre and to enhance cabling.

The product's benefits:
+ High density (144FO/U)
+ Modularity (Patching, Splicing, Transition)
+ Scalability: 2 chassis heights (1U, 4U)
+ Flexibility: possibility to add modules from the chassis' front or rear side
+ Security: independent fibre flow per module

Technical specifications:

Parameter		Specifications	
Chassis type		IANOS chassis	
Size		19"	
Height		1U	4U
RoHS requirement 2002/95/EC		100% compliant	
REACH standard			
Halogen free		Yes	
Chassis	Material	Stainless steel	
	Colour	Grey	
	Dimensions (L x W x H)	328mm x 483mm x 44mm	328mm x 483mm x 177mm
Weight		3.6kg	12.4kg
Maximum number of modules		12	48
Maximum capacity in LC version		72 ports / 144 fibres	288 ports / 576 fibres

Telenco reserves the right to modify specifications without prior notice

1U IANOS Chassis

HUBER+SUHNER

PN	Size	Height	Slot number	Weight
91445	19"	1U	12	3.60kg

4U IANOS Chassis

HUBER+SUHNER

PN	Size	Height	Slot number	Weight
92618	19"	4U	48	12.40kg

1U IANOS Accessories

Cable tray

HUBER+SUHNER

PN	Size	Height	Slot number	Weight
91448	19"	1U	12	0.60kg

Characteristics:

Length: 279mm
Width: 449mm
Height: 41mm

Lateral patchcord guide

HUBER+SUHNER

PN	Size	Height	Slot number	Weight
92942	19"	1U	12	0.45kg

Characteristics:

Length: 133mm
Width: 89mm
Height: 44mm

4U IANOS Accessories

Cable tray

HUBER+SUHNER

PN	Size	Height	Slot number	Weight
92619	19"	4U	48	0.70kg

Characteristics:

Length: 279mm
Width: 449mm
Height: 171mm

Lateral patchcord guide

HUBER+SUHNER

PN	Size	Height	Slot number	Weight
92943	19"	4U	48	0.95kg

Characteristics:

Length: 130mm
Width: 89mm
Height: 177mm

IANOS Modules

The Huber+Suhner® IANOS modules can be installed into Huber+Suhner® 19" IANOS chassis. Engineered for a quick installation and an easy access, they are extremely compact and lightweight. They can be easily integrated into and removed from IANOS chassis as soon as the datacenter evolves, without interfering with pre-installed fibres.

The Huber+Suhner® IANOS modules cover a wide range of applications: Patching (for the connection of pre-terminated cables), Splicing (for connecting optical fibres by using splicing applications), Transition (to convert MTP® cables into Duplex LC and SC connectivity solutions).

These applications are configurable with various:

- Connectivity solutions (SC, LC or MTP®)
- Sizes (simple or double)
- Fibre optic types (Singlemode or Multimode)

The product's benefits:

+ Quick and toolless installation from front or rear side
+ Scalability: possibility of adding modules if necessary
+ Flexibility: available in SC/LC/MTP® and singlemode/multimode versions
+ Modularity: simple or double version
+ Easy identification by colour code or label system
+ Quick and secure access to fibres

All these combinations can be integrated and exchanged in the same Huber+Suhner® 1U or 4U IANOS chassis. The installation and maintenance of Huber+Suhner® IANOS modules is fast as they can be operated either at the rear side or at the front of the chassis, without tools. This allows a great flexibility when installing modules, even in confined or dense environments.

The Huber+Suhner® IANOS modules feature a clear and quickly visible labelling system that helps reducing installation and service times and have a significant impact on the operational costs of the datacenter.

IANOS Patching module

HUBER+SUHNER

PN	Connector type	Connector number	Fibre count	Weight
92620	Duplex LC/UPC	6	12	0.05kg

Available configurations:

LC/UPC

Fibre type: Singlemode

IANOS Double Splicing module

HUBER+SUHNER

PN 92621

PN 91451

PN	Connector type	Connector number	Fibre count	Weight
92621	SC/APC	12	12	0.24kg
91451	Duplex LC/UPC	24		

Available configurations:

SC/APC

LC/UPC

Fibre type: Singlemode (G.652D)

Technical specifications:

Parameter		Specifications		
Module type		IANOS Patching module	IANOS Double splicing module	
Compatible connectors		LC/UPC	LC/UPC	SC/APC
Colours of the connectors		Blue	Blue	Green
Number of connectors		6	12	
Fibre optic count		12FO	24FO	12FO
Weight		0.05kg	0.24kg	
Module dimensions (L x W x H)		172mm x 97mm x 12mm	177mm x 199mm x 12mm	
Pigtail code colour		-	TIA	
Module material		PC	PC	
Module colour		Black	Black	
RoHS directive 2002/95/EC		100% compliant	100% compliant	
REACH standard				
Halogen free		Yes	Yes	
Other versions available on request	**Singlemode**	MTP®/APC, LC/APC, SC/APC	Simple and double module: LC/APC, SC/UPC	
	Multimode	SC/PC, LC/PC, MTP®/PC	Simple and double module: LC/PC, SC/PC	

Telenco reserves the right to modify specifications without prior notice

IANOS Double Transition module

HUBER+SUHNER

PN 92622

HUBER+SUHNER

PN 92280

PN	Version	Connector type	Number of connectors	Fibre count	Weight
92622	MTA F 12AP	SC/APC	1	12	0.30kg
92280	2MTA F 12AP	Duplex LC/UPC	2	24	
92623	3MTA F 8NS		3		
92944	MTA F 24R1		1		

Available configurations:

1st configuration:

MTP®/APC

SC/APC

2nd configuration:

MTP®/APC

LC/UPC

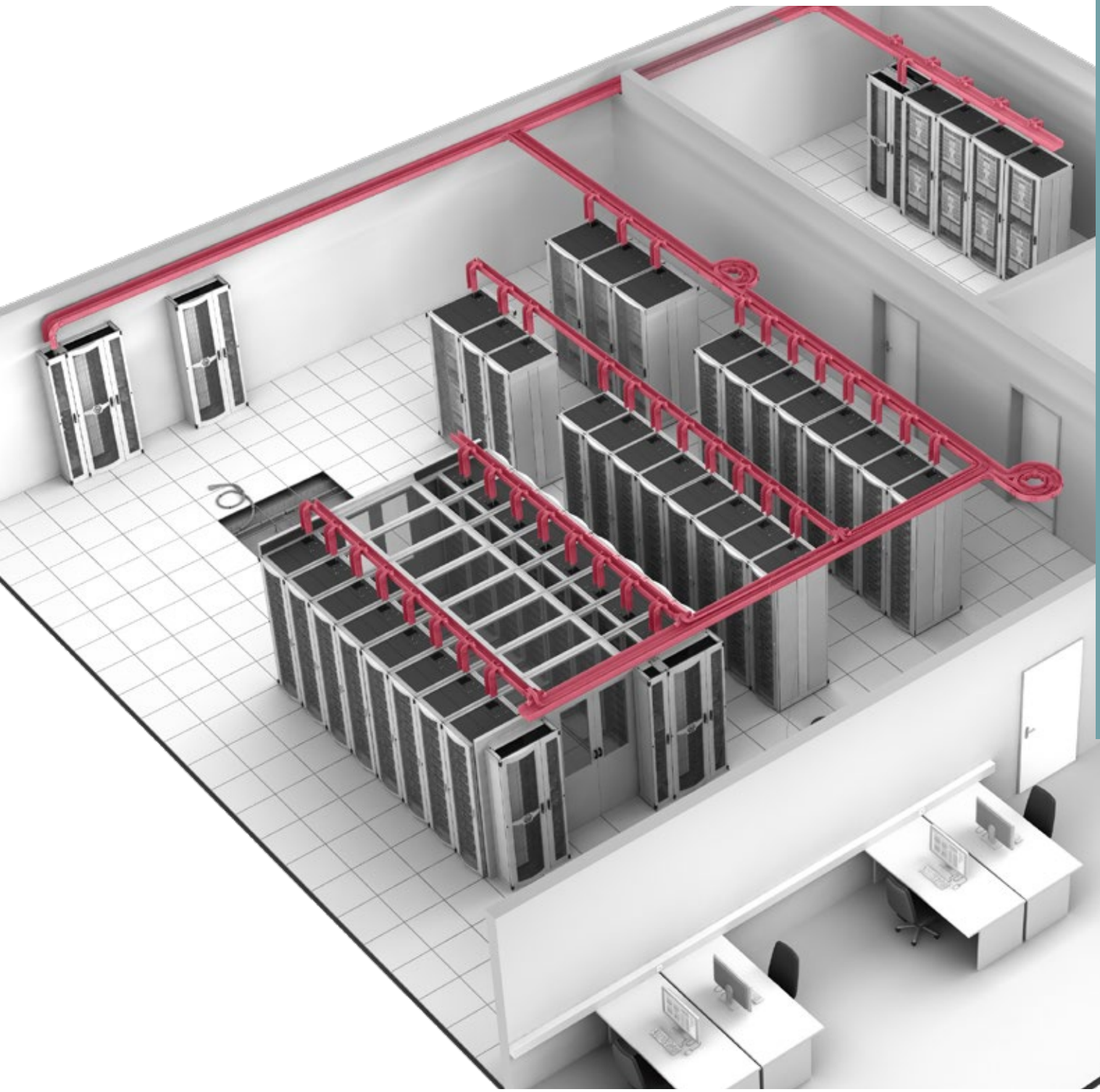
Fibre type: Singlemode

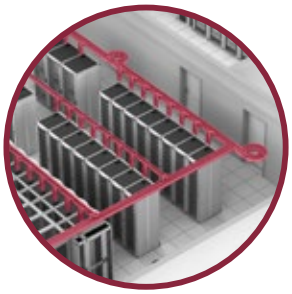
Technical specifications:

Parameter		Specifications			
Module type		IANOS Double Transition module			
Compatible connectors		MTP®/APC-LC/UPC			MTP®/APC-SC/APC
Version		3MTA F 8NS	2MTA M 12AP	1MTA F 24R1	1MTA M 12AP
Number of adaptors		12			
Fibre optic count		24FO			12FO
Number of MTP® outputs		3	2	1	1
Type of MTP® connectors		MTP®/APC	MTP®/APC	MTP®/APC	MTP®/APC
Weight		0.30kg			
Module dimensions (L x W x H)		172mm x 196mm x 12mm			
Module material		PC			
Module colour		Black			
RoHS directive 2002/95/EC		100% compliant			
REACH standard					
Halogen free		Yes			
Other versions available on request	**Singlemode**	Double module: MTP®/APC-LC/APC, MTP®/APC-SC/UPC			
	Multimode	Double module: MTP®/PC-LC/PC, MTP®/PC-SC/PC			

Telenco reserves the right to modify specifications without prior notice

OPTICAL DISTRIBUTION





Micro Break out trunks

The Telenco® singlemode and multimode micro break out trunks ease the cabling deployment in datacenters, computer centers and high density patching environments.

Their reduced diameter allows for a maximum space saving and therefore a simplified cable routing for time-saving installation jobs. They present capacities from 1 to 24FO.

The Telenco® singlemode and multimode micro break out trunks are pre-terminated in our production units and allow for quick connections between different equipment. They are 100% configurable and can be equipped with connectors at one or both ends.

The product's benefits:

+ Small footprint
+ Very flexible
+ Premium optical quality
+ 100 % configurable
+ Reduced installation time
+ 100 % dielectric

The Telenco® singlemode and multimode micro break out trunks have, as an option, a connector protection system, a pull ring and are supplied with a measurement sheet. They can be equipped with standard LC, LC Push-Pull and MTP® connectors.

The Telenco® singlemode and multimode micro break out trunks are LSZH (Low Smoke Zero Halogen) compliant.

Available configurations:

Colours:

Fibre types: Singlemode (G.652D, G.657A2), Multimode (OM3, OM4)
Total length: 2m to 300m
Fanout length: 0.3m to 2.5m
Diameters: Ø 3mm, Ø 3.6mm

LC/UPC-LC/UPC Trunk

PN	Connector type	Fanout length	Fibre type	Fibre count	Length	Diameter	Weight
92367	LC/UPC	0.5m	G.652D	12	30.0m	Ø 3.0mm	0.40kg
92945				24		Ø 3.6mm	0.60kg

PN 92367

MTP®/APC-LC/UPC Trunk

PN	Connector type	Fanout length	Fibre type	Fibre count	Length	Diameter	Weight
92946	MTP®/APC M-LC/UPC	0.5m	G.652D	8	300m	Ø 3.0mm	0.30kg
92947	MTP®/APC F-LC/UPC			12		Ø 3.0mm	0.40kg
92948	MTP®/APC M-LC/UPC			24		Ø 3.6mm	0.60kg

PN 92947

MTP®/APC-MTP®/APC Trunk

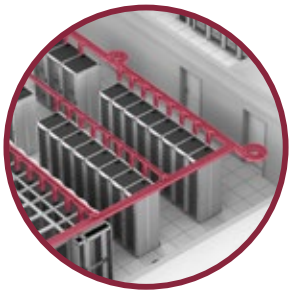
PN 92197

PN	Connector type	Fibre type	Fibre count	Length	Diameter	Weight
92949	MTP®/APC M	G.652D	8	30.0m	Ø 3.0mm	0.20kg
92197	MTP®/APC F		12		Ø 3.0mm	0.30kg
92950	MTP®/APC M		24		Ø 3.6mm	0.50kg

Technical specifications:

Parameter	Specifications			
Fibre type	G.652D	G.657A2	OM3	OM4
Cable colour	Yellow		Aqua	Magenta
Fibre optic count	From 1 to 24FO			
Flame retardant IEC 60332-1	100% compliant			
Halogen free IEC 60754-2-1/-2				
Low smoke emission IEC 61034-2-1/-2				
Cable material	LSZH (Low Smoke Zero Halogen)			
Cable reinforcement material	Aramid yarns			
Connector material	Body: thermoplastic Ferrule: Zirconia			
Minimum bending radius	Static: 5 x Ø Dynamic: 15 x Ø			
Outer cable diameter	From 1 to 12 optical fibres: Ø 3.0mm From 13 to 24 optical fibres: Ø 3.6mm			
Insertion Loss (IL)	Grade B ≤ 0.12dB on average and ≤ 0.25dB max for 97% of connections		≤ 0.30dB	
Return Loss (RL)	≥ 60dB (APC) and ≥ 50dB (UPC)		≥ 30dB	
Mechanical tests	Δ IL ≤ 0.20dB			
Environmental tests				
Temperature	Operation, transport and storage: -40° C / +60° C			
Cable tensile strength	Permanent: 120N Installation: 220N			
Other versions available on request	Micro break out trunks are available in reinforced version with a cable Ø 4.5mm			

Telenco reserves the right to modify specifications without prior notice



Optical patchcords

LC Push-Pull and Uniboot LC Push-Pull patchcords

The Huber+Suhner® Simplex LC Push-Pull and Duplex Uniboot LC Push-Pull optical patchcords are used to interconnect the various equipment in datacenters requiring high density patching and a significant need for scalability.

The Push-Pull system features a push/pull mechanism as well as an extended tab that allows the locking and the removal of the connectors even in a high density network configuration with limited accessibility. This makes connections/disconnections simple and fast.

The Huber+Suhner® Uniboot LC Push-Pull version has, in addition, a common boot for the 2 connectors. This Uniboot design allows to significantly reduce the occupied space by using one single cable with reduced diameter for both fibres. It also allows the polarity of the cable to be changed on site, without using special tools, and presents a polarity indicator on each connector.

The Huber+Suhner® LC Push-Pull and Uniboot LC Push-Pull patchcords can be equipped, as an option, with a label holder on the extended tab. This labeling improves network identification, traceability and structuring. Labels can be created with standard label printers and can be easily removed if necessary.

Uniboot LC Push-Pull- Duplex version

1. Polarity indicator - can be reversed without special tools
2. Tab for easy connections/disconnections
3. Label positioning
4. Cable diameter: Ø 2.1mm
5. One single boot for the 2 LC ferrules: «Uniboot» system
6. HD bracelet for Duplex Uniboot LC patchcord «Push-Pull» locking mechanism

The Huber+Suhner® LC Push-Pull and Uniboot LC Push-Pull optical patchcords are multi-network solutions, available in LC/UPC, LC/APC and multimode LC/PC versions. They provide for a high degree of flexibility and are available in a wide range of lengths.

The Huber+Suhner® LC Push-Pull and Uniboot LC Push-Pull patchcords are fully compliant with IEC-61300, IEC 61753-1, IEC-61754-20 and TIA 604-10-A standards.

Simplex Push-Pull LC/UPC optical patchcord Ø 1.8mm

PN	Fibre type	Length	Weight
92951	G.657A2	2.0m	0.02kg
92464		3.5m	
92952		5.0m	

PN 92464

The product's benefits:

+ Easy to connect/disconnect thank to its Push-Pull system
+ Extended tab ideal for high density patching environments
+ Innovative design for great accessibility
+ Label holder on the connector for improved network identification, traceability and structuring

Available configurations:

LC/UPC Push-Pull

LC/APC Push-Pull

LC/PC OM3 Push-Pull

LC/PC OM4 Push-Pull

Colours:

Fibre type: Singlemode (G.657A2), Multimode (OM3, OM4)
Length: 0.5m to 40m
Diameter: Ø 1.8mm

Technical specifications:

Parameter	Specifications			
Fibre type	G.657A2		OM3	OM4
Fibre optic count	1FO			
Connector type	LC/UPC Push-Pull	LC/APC Push-Pull	LC/PC Push-Pull	
IEC-61300	100% compliant			
Connector material	Body: thermoplastic Ferrule: Zirconia			
Cable material	LSZH (Low Smoke Zero Halogen)			
Cable diameter	Ø 1.8mm			
Insertion Loss (IL)	≤ 0.30dB			
Return Loss (RL)	≥ 50dB	≥ 60dB	≥ 35dB	
Temperature	Operation, transport and storage: -25° C / +70° C			
Tensile strength	70N			

Telenco reserves the right to modify specifications without prior notice

Duplex Uniboot LC/UPC Push-Pull patchcord Ø 2.1mm

HUBER+SUHNER

PN	Fibre type	Length	Weight
92085	G.657A2	2.0m	0.02kg
92115		3.5m	
92116		5.0m	

PN 92085

The product's benefits:

+ Easy to connect/disconnect thank to its Push-Pull system
+ Extended tab ideal for high density patching environments
+ Innovative design for great accessibility
+ Uniboot system for a maximum space saving
+ Polarity can be changed on site, without tools
+ Label holder on the connector for improved network identification, traceability and structuring

Available configurations:

LC/UPC Push-Pull Uniboot

LC/APC Push-Pull Uniboot

LC/PC OM3 Push-Pull Uniboot

LC/PC OM4 Push-Pull Uniboot

Colours:

Fibre type: Singlemode (G.657A2), Multimode (OM3, OM4)
Length: 0.5m to 40m
Diameter: Ø 2.1mm

Technical specifications:

Parameter	Specifications			
Fibre type	G.657A2		OM3	OM4
Fibre optic count	2FO			
Connector type	LC/UPC Push-Pull Uniboot	LC/APC Push-Pull Uniboot	LC/PC Push-Pull Uniboot	
IEC-61300 / IEC-61754-20 / TIA 604-10-A	100% compliant			
Flammability rating	UL 94 V-0			
Connector material	Body: Thermoplastic Ferrule: Zirconia			
Cable material	LSZH (Low Smoke Zero Halogen)			
Cable diameter	Ø 2.1mm			
Insertion Loss (IL)	≤ 0.30dB		≤ 0.50dB	≤ 0.30dB
Return Loss (RL)	≥ 50dB	≥ 65dB	≥ 35dB	
Mechanical tests	100% compliant with IEC 61753-1			
Environmental tests				
Durability	≤ 1000 connection cycles			
Temperature	Operation, transport and storage: -25° C / +70° C			
Tensile strength	70N			

Telenco reserves the right to modify specifications without prior notice

Simplex and Duplex patchcords

The Telenco® singlemode and multimode optical patchcords offer high-end optical performances providing for reliable networks. They are used to interconnect the various equipment in datacenters.

Available in Simplex and Duplex versions, they can be equipped with standard LC and SC connectors, as well as with Secure SC connectors.

The product's benefits:

+ High precision ceramic
+ Great interoperability
+ Easy to install
+ Excellent mechanical and temperature stability
+ 100% configurable

The Telenco® singlemode and multimode optical patchcords comply with IEC-61300 standards.

Simplex optical patchcord Ø 1.6/2.0mm

PN	Connector type	Diameter	Length	Weight
91403	LC/UPC	Ø 2.0mm	2.0m	0.02kg
91404			3.0m	0.02kg
91405			5.0m	0.03kg
09489	SC/APC		2.0m	0.02kg
13227			3.0m	0.03kg
11387			5.0m	0.03kg

PN 91403

Available configurations:

SC/APC

SC/UPC

LC/APC

LC/UPC

FC/UPC

Secure SC

Colours:

Fibre type: Singlemode (G.657A2)
Length: 0.5m to 40m
Diameter: Ø 1.6mm, Ø 2.0mm

Technical specifications:

Parameter	Specifications
Fibre type	G.657A2
Cable colour	Yellow
Fibre count	1FO
IEC-61300	100% compliant
Connector material	Body: Thermoplastic Ferrule: Zirconia
Cable material	LSZH (Low Smoke Zero Halogen)
Cable diameter	Ø 1.6mm/ 2.0mm
Insertion Loss (IL)	Grade B ≤ 0.12dB on average and ≤ 0.25dB max for 97% of connections
Return Loss (RL)	≥ 60dB (APC) and ≥ 50dB (UPC)
Mechanical tests	Δ IL ≤ 0.20dB
Environmental tests	
Temperature	Operation, transport and storage: -40° C / +75° C
Tensile strength	70N

Telenco reserves the right to modify specifications without prior notice

Duplex LC/UPC-LC/UPC patchcord Ø 2.0mm

PN	Fibre type	Colour	Length	Weight
90984	G.657A2	Yellow	2.0m	0.04kg
91463			3.0m	0.04kg
91464			5.0m	0.06kg
91460	OM3	Aqua	2.0m	0.04kg
91068			3.0m	0.04kg
92953			5.0m	0.06kg
91461	OM4	Magenta	2.0m	0.04kg
91074			3.0m	0.04kg
91157			5.0m	0.06kg

PN 90984

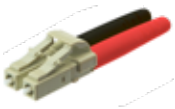
Available configurations:

Singlemode (G.657A2):

LC/UPC

LC/APC

Multimode (OM3, OM4):



LC/UPC

Colours:

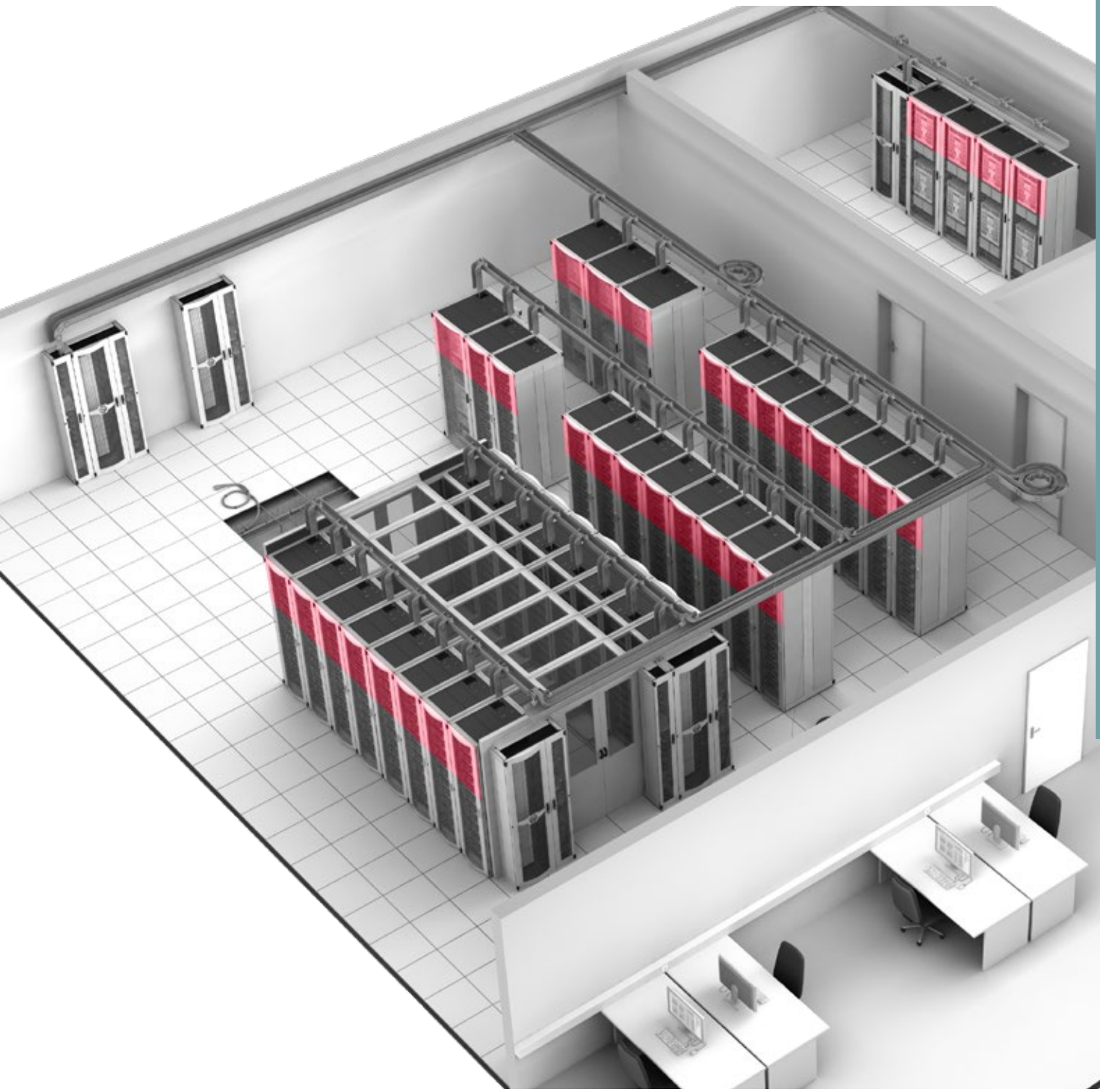
Length: 0.5m to 40m
Diameter: Ø 2.0mm

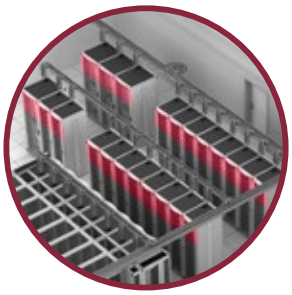
Technical specifications:

Parameter	Specifications	
Fibre type	OM3	OM4
Cable colour	Aqua	Magenta
Fibre count	2FO	
IEC-61300	100% compliant	
Connector material	Body: Thermoplastic Ferrule: Zirconia	
Cable material	LSZH (Low Smoke Zero Halogen)	
Outer diameter of the cable	Ø 2.0mm	
Insertion Loss (IL)	≤ 0.30dB	
Return Loss (RL)	≥ 30dB	
Mechanical tests	Δ IL ≤ 0.20dB	
Environmental tests		
Temperature	Operation, transport and storage: -40° C / +75° C	
Tensile strength	70N	

Telenco reserves the right to modify specifications without prior notice

OPTICAL CABLING FOR RACKS





Suspended connectivity solution

19" Suspended rack

The 19" suspended rack is specifically designed to meet the needs of datacenters requiring distribution of the connectivity equipment above the racks. They are compatible with most of the 19" rack mountable equipment. With a rugged design, it presents a front panel enabling a full link protection.

HUBER+SUHNER

PN	Format	Height	Weight
93054	19"	4U	7,7kg

Characteristics :

Length : 217mm **Width :** 522mm **Height :** 348mm

19" IANOS High density solution

The 19" IANOS solution has been specifically developed to meet high density patching and modularity needs in datacenters. This solution offers a capacity of up to 144FO per rack unit.

1U IANOS Chassis

IANOS Chassis

HUBER+SUHNER

PN	Size	Slot number	Weight
91445	19"	12	3.60kg

Characteristics:

Length: 328mm
Width: 483mm
Height: 44mm

1U IANOS Accessories

Rear cable track

HUBER+SUHNER

PN	Size	Slot number	Weight
91448	19"	12	0.60kg

Characteristics:

Length: 279mm
Width: 449mm
Height: 41mm

Lateral patchcord guide

HUBER+SUHNER

PN	Size	Slot number	Weight
92942	19"	12	0.45kg

Characteristics:

Length: 133mm
Width: 89mm
Height: 44mm

IANOS Modules

IANOS Patching module

HUBER+SUHNER

PN 92620

PN	Connector type	Connector number	Fibre type	Fibre count	Weight
92620	Duplex LC/UPC	6	Singlemode	12	0.05kg
92954			Multimode (OM4)		

Available configurations:

LC/UPC

Colour:

Fibre type: Singlemode (G.652D), Multimode (OM3, OM4)
Length: 172mm
Width: 97mm
Height: 12mm

IANOS Splicing module

PN	Connector type	Connector number	Fibre type	Fibre count	Weight
92955	Duplex LC/UPC	6	G.652D	12	0.24kg
91451	Duplex LC/UPC	12		24	
92621	SC/APC	12		12	
92956	Duplex LC/PC	6	OM4	12	
92957	Duplex LC/PC	12		24	
92958	SC/PC	12		12	

HUBER+SUHNER

PN 91451

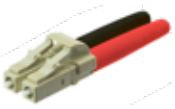
Available configurations:

Singlemode (G.652D):

LC/UPC

SC/APC

Multimode (OM3,OM4):



LC/PC

SC/PC

Colour:

●

Simple module:
Length: 190mm
Width: 97mm
Height: 12mm

Double module:
Length: 177mm
Width: 199mm
Height: 12mm

IANOS Transition module

PN	Connector type	Adaptor type	Connector number	Fibre type	Fibre count	Weight
92280	MTA M12AP	Duplex LC/UPC	2	Singlemode	24	0.30kg
92944	MTA F24R1	Duplex LC/UPC	1		24	
92622	MTA M12AP	SC/APC	1		12	
92959	MTP® M12AP	Duplex LC/PC	2	Multimode (OM4)	24	
92960	MTP® F24R1	Duplex LC/PC	1		24	
92961	MTP® M12AP	SC/PC	1		12	

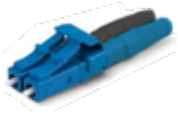
HUBER+SUHNER

PN 92280

Available configurations:

Singlemode (G.652D)
1st configuration:

MTP®/APC



LC/UPC

2nd configuration:

MTP®/APC

SC/APC

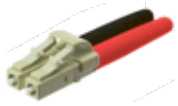
Colour:

●

Length: 172mm
Width: 196mm
Height: 12mm

Multimode (OM3,OM4)
3rd configuration:

MTP®/PC

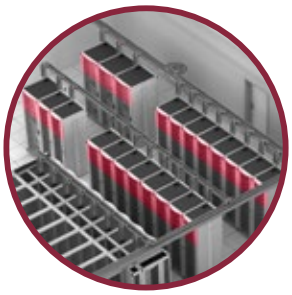


LC/PC

4th configuration:

MTP®/PC

SC/PC



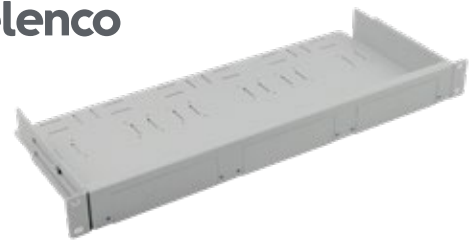
19" Medium density solutions

The 19" Medium density modules and chassis are specifically developed to meet the needs of datacenters requiring medium density optical patching and high modularity. The 19" Medium density solutions provide for capacities of up to 72 FO per rack unit for Patching versions, respectively 96FO per rack unit for MTP® Transition versions.

7HP Chassis

1U 7HP Chassis

Telenco



PN	Size	Height	Number of modules	Weight
50033	19"	1U	3	2.00kg

Characteristics:

Length: 221mm
Width: 427mm
Height: 44mm

3U 7HP Chassis

PN	Size	Height	Number of modules	Weight
50034	19"	3U	12	2.00kg

Characteristics:

Length: 221mm
Width: 427mm
Height: 132mm

3U 7HP Chassis accessories

1-Unit cache

Telenco

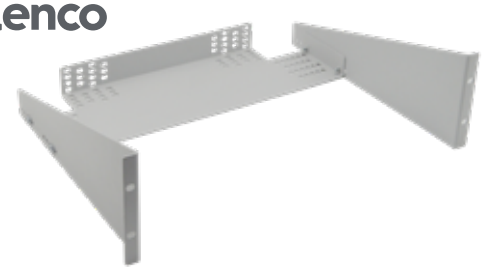
PN	Designation	Weight
50032	1-unit cache for 1U or 3U 7HP chassis	0.05kg

Characteristics:

Thickness: 1.5mm
Width: 35mm
Height: 129mm

Rear cable tray

Telenco



PN	Designation	Weight
91288	Rear cable tray for 3U 7HP chassis	3.00kg

Characteristics:

Length: 35mm
Width: 427mm
Height: 132mm

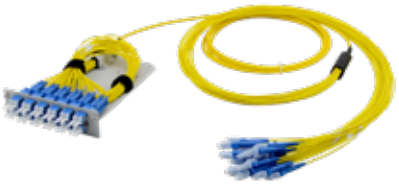
7HP Modules

7HP Patching module

PN	Connector type	Connector number	Fibre type	Fibre count	Weight
92962	LC/UPC	4	Singlemode	8	0.40kg
92963	Duplex LC/UPC	6		12	
92964	Duplex LC/UPC	12		24	
92965	SC/APC	8		8	
91511	SC/APC	12		12	
92966	LC/UPC	4	Multimode (OM3)	8	
92967	Duplex LC/UPC	6		12	
50038	Duplex LC/UPC	12		24	
92968	LC/UPC	4	Multimode (OM4)	8	
92969	Duplex LC/UPC	6		12	
92900	Duplex LC/UPC	12		24	

Mounting kit for Optilink trunk

Telenco



PN 50038

Characteristics:

Fibre type: Singlemode, Multimode (OM3, OM4)
Length: 175mm
Width: 35mm
Height: 129mm

MD Chassis

1U MD MTP® Transition chassis

PN	Size	Height	Number of modules	Weight
92970	19"	1U	4	2.00kg

Telenco

Characteristics:

Length: 202mm
Width: 427mm
Height: 44mm

MD Modules

MD MTP® Transition module

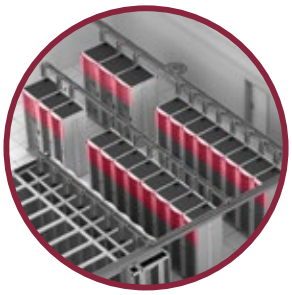
PN	Connector type	Adaptor type	Connector number	Fibre type	Fibre count	Weight
92971	MTA F8NS	LC/UPC	1	Singlemode	8	0.45kg
92972	MTA M12AP	LC/UPC	1		12	
92973	MTA F8NS	LC/UPC	2		16	
92974	MTA F24R1	LC/UPC	1		24	
92975	MTA M12AP	LC/UPC	2		24	
92976	MTA M12AP	SC/APC	1		12	
92977	MTP® M12AP	LC/UPC	1	Multimode (OM3)	12	
92978	MTP® F24R1	LC/UPC	1		24	
92979	MTP® M12AP	LC/UPC	2		24	
92980	MTP® M12AP	LC/UPC	1	Multimode (OM4)	12	
92981	MTP® F24R1	LC/UPC	1		24	
92982	MTP® M12AP	LC/UPC	2		24	

Telenco

PN 92975

Characteristics:

Fibre type: Singlemode, Multimode (OM3, OM4)
Length: 115mm
Width: 88mm
Height: 42mm



19" Standard solution

The 19" Sliding patch panels are specifically designed to meet the needs of fibre optic high density patching applications.
The 19" standard solution provides for a capacity of up to 48FO per rack unit.

19" 1U LC/UPC Sliding patch panel - trunk version

PN	Fibre type	Fibre count	Weight
92341	Singlemode	6	2.00kg
92030		12	
50064		24	
92033		36	
50076		48	
92983	Multimode	6	
50078		12	
92984		24	
92985		36	
92986		48	

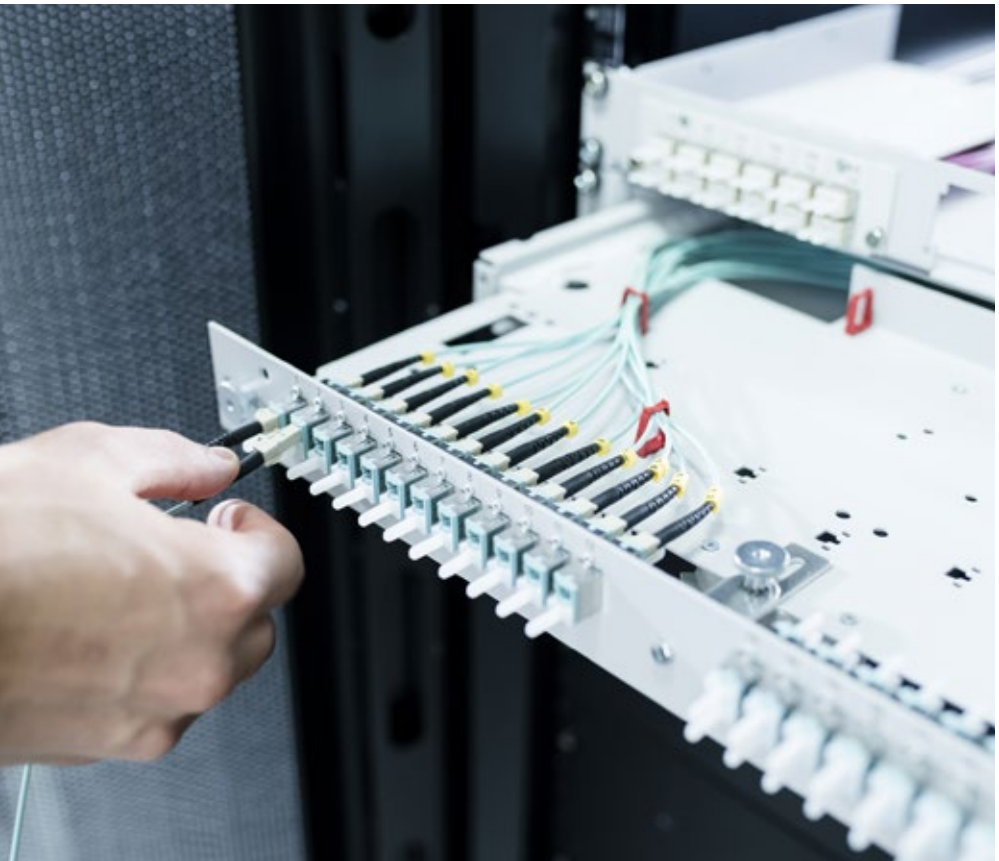
Telenco

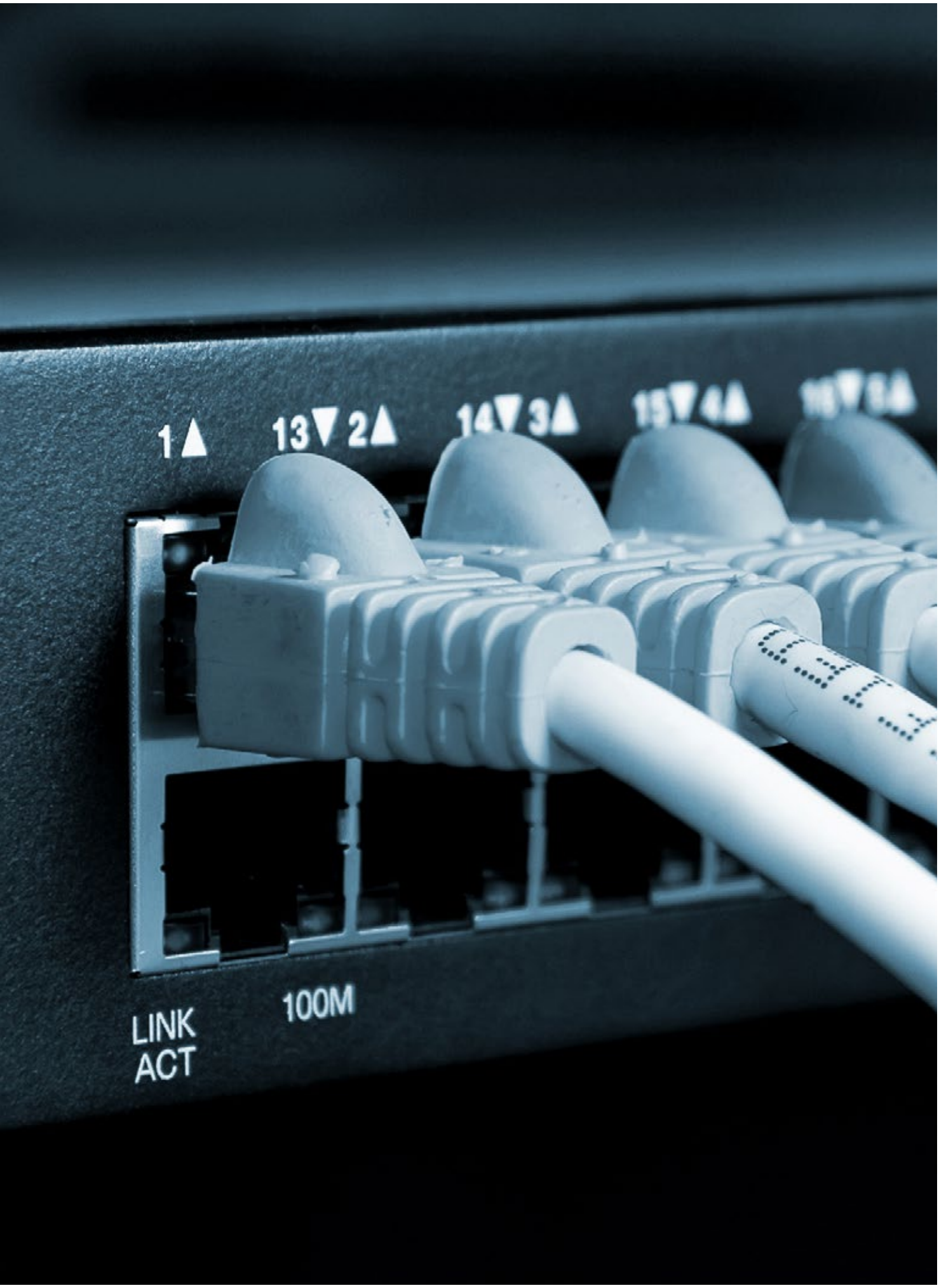
PN 50064

Characteristics:

Fibre type: Singlemode, Multimode
Length: 201mm
Width: 482mm
Height: 44mm

Private networks




1
13 2
14 3
15 4
LINK
ACT
100M

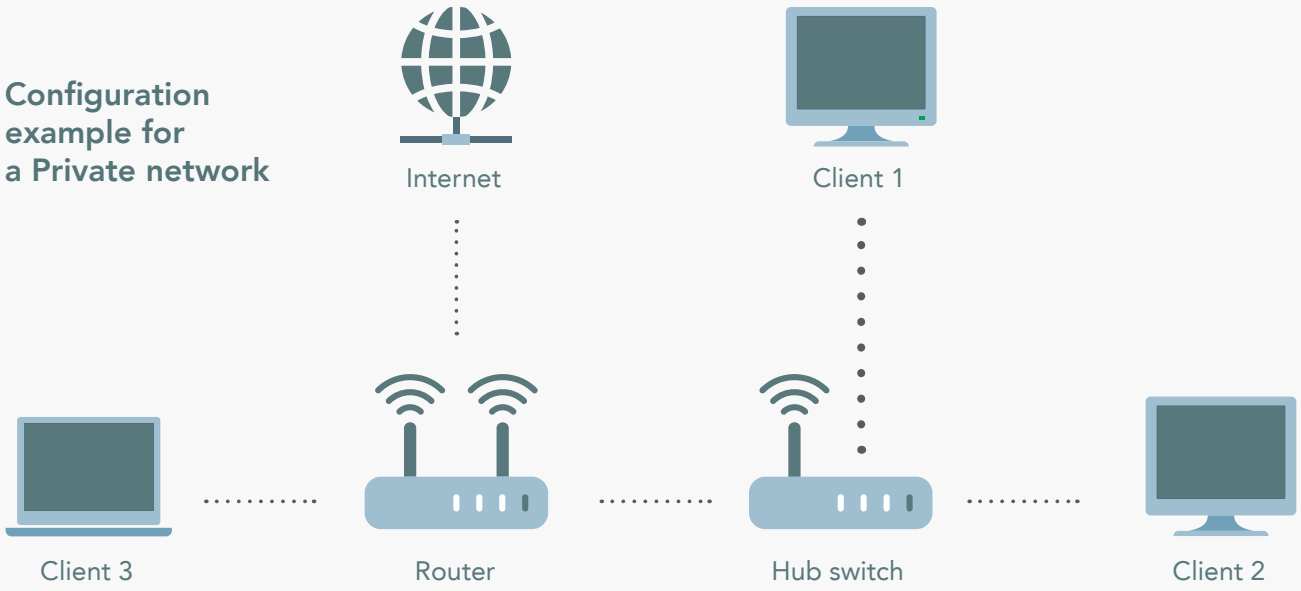
The Private network is used to interconnect the computers of a company or a public administration.

It is essential for their well-functioning and manages all the data: the storage, messaging, collaborative communication applications, web browsing, software, servers, printers, etc.

All of these data feeds represent a significant amount of content requiring a broad bandwidth, especially collaborative communication applications including video calls. A reliable and effective Private network is essential to ensure comprehensive communication between people. It allows the rapid transfer of large amounts of data.

The Private network represents a major challenge as it is placed at the core of the information system of a company or an administration.

Configuration example for a Private network



Telenco networks offers a full range of products for Private networks and more specifically for the following environments:

- **Optical cabling**
- **Copper cabling**
- **Racks, wall-mounted cabinets and accessories**

Optical patchcords

Simplex LC/UPC-LC/UPC patchcord Ø 1.6/2.0mm

PN	Fibre type	Diameter	Colour	Length	Weight
91403	G.657A2	Ø 2.0mm	Yellow	2.0m	0.02kg
91404				3.0m	0.02kg
91405				5.0m	0.03kg
09489				2.0m	0.02kg
13227				3.0m	0.03kg
11387				5.0m	0.03kg

PN 91403

Available configurations:

SC/APC

SC/UPC

LC/APC

LC/UPC

FC/UPC

Secure SC

Colour:

Fibre type: Singlemode (G.657A2)
Length: 0.5m to 40m
Diametre: Ø 1.6mm, Ø 2.0mm

Duplex LC/UPC-LC/UPC patchcord Ø 2.0mm

PN	Fibre type	Diameter	Colour	Length	Weight
90984	G.657A2	Ø 2.0mm	Yellow	2.0m	0.04kg
91463				3.0m	0.04kg
91464				5.0m	0.06kg
91460	OM3		Aqua	2.0m	0.04kg
91068				3.0m	0.04kg
92953				5.0m	0.06kg
91461	OM4		Magenta	2.0m	0.04kg
91074				3.0m	0.04kg
91157				5.0m	0.06kg

PN 90984

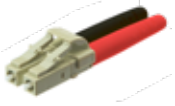
Available configurations:

Singlemode (G.657A2):

LC/UPC

LC/APC

Multimode (OM3, OM4):



LC/UPC

Colours:

Length: 0.5m to 40m
Diametre: Ø 2.0mm

Technical specifications for Simplex and Duplex patchcords:

Parameter		Specifications		
Fibre type		G.657A2	OM3	OM4
Cable colour		Yellow	Aqua	Magenta
Fibre count	**Simplex**	1FO		
	Duplex	2FO		
IEC-61300		100% compliant		
Connector material		Body: Thermoplastic Ferrule: Zirconia		
Cable material		LSZH (Low Smoke Zero Halogen)		
Outer diameter of the cable	**Simplex**	Ø 1.6mm / 2.0mm		
	Duplex	Ø 2.0mm		
Insertion Loss (IL)		Grade B ≤ 0.12dB on average and ≤ 0.25dB max for 97% of connections	≤ 0.30dB	
Return Loss (RL)		≥ 60dB (APC) and ≥ 50dB (UPC)	≥ 30dB	
Mechanical tests		Δ IL ≤ 0.20dB		
Environmental tests				
Temperature		Operation, transport and storage: -40° C / +75° C		
Tensile strength		70N		

Telenco reserves the right to modify specifications without prior notice

Micro break out trunks

SC/APC-SC/APC Trunk

PN	Connector type	Fanout length	Diameter	Fibre type	Fibre count	Length	Weight
92572	SC/APC	0.5m	Ø 3.0mm	G.652D	12	10.0m	0.20kg
92987			Ø 3.6mm		24		0.30kg

PN 92572

Characteristics:

Colour:

Fibre type: Singlemode (G.652D, G.657A2)
Total length: 2m to 300m
Fanout length: 0.3m to 2.5m
Diameters: Ø 3mm, Ø 3.6mm

SC/UPC-SC/UPC Trunk

PN	Connector type	Fanout length	Diameter	Fibre type	Fibre count	Length	Weight
92988	SC/UPC	0.5m	Ø 3.0mm	G.652D	12	10.0m	0.20kg
92989			Ø 3.6mm	G.652D	24		0.30kg
92990	SC/PC		Ø 3.0mm	OM3	12		0.20kg
92991			Ø 3.6mm	OM3	24		0.30kg
92992			Ø 3.0mm	OM4	12		0.20kg
92993			Ø 3.6mm	OM4	24		0.30kg

PN 92988

Characteristics:

Colour:

Fibre type: Singlemode (G.652D, G.657A2), Multimode (OM3,OM4)
Total length: 2m to 300m
Fanout length: 0.3m to 2.5m
Diameters: Ø 3mm, Ø 3.6mm

LC/UPC-LC/UPC Trunk

PN	Connector type	Fanout length	Diameter	Fibre type	Fibre count	Length	Weight
92994	LC/UPC	0.5m	Ø 3.0mm	G.652D	12	10.0m	0.20kg
92995			Ø 3.6mm	G.652D	24		0.30kg
92996			Ø 3.0mm	OM3	12		0.20kg
92997			Ø 3.6mm	OM3	24		0.30kg
92998			Ø 3.0mm	OM4	12		0.20kg
92999			Ø 3.6mm	OM4	24		0.30kg

PN 92994

Characteristics:

Colours:

Fibre type: Singlemode (G.652D, G.657A2), Multimode (OM3,OM4)
Total length: 2m to 300m
Fanout length: 0.3m to 2.5m
Diameters: Ø 3mm, Ø 3.6mm

Technical specifications for micro break out trunks:

Parameter	Specifications			
Fibre type	G.652D	G.657A2	OM3	OM4
Cable colour	Yellow		Aqua	Magenta
Fibre optic count	From 1 to 24FO			
Flame retardant IEC 60332-1	100% compliant			
Zero Halogen IEC 60754-2-1/-2				
Low Smoke IEC 61034-2-1/-2				
Cable material	LSZH (Low Smoke Zero Halogen)			
Cable reinforcement material	Aramid yarns			
Connector material	Body: Thermoplastic Ferrule: Zirconia			
Minimum bending radius	Static: 5 x Ø Dynamic: 15 x Ø			
Outer diameter of the cable	From 1 to 12 fibres: Ø 3.0mm From 13 to 24 fibres: Ø 3.6mm			
Insertion Loss (IL)	Grade B ≤ 0.12dB on average and ≤ 0.25dB max for 97% of connections		≤ 0.30dB	
Return Loss (RL)	≥ 60dB (APC) and ≥ 50dB (UPC)		≥ 30dB	
Mechanical tests	Δ IL ≤ 0.20dB			
Environmental tests				
Temperature	Operation, transport and storage: -40° C / +60° C			
Tensile strength	Permanent: 120N Installation: 220N			
Other versions available on request	Micro break out trunks are available in reinforced version with a cable Ø 4.5mm			

Telenco reserves the right to modify specifications without prior notice

19" Sliding patch panels

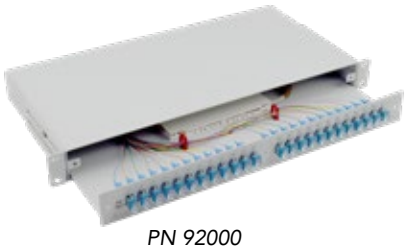
1U Sliding patch panels - optical version

19" 1U Sliding patch panel - colour splicing version - assembled

PN	Connector type	Fibre type	Fibre count	Weight
90959	SC/APC	G.657A2	12	2.50kg
91995	SC/UPC		12	
91993	LC/UPC		12	
15411	SC/APC		24	
92000	SC/UPC		24	
91998	LC/UPC		24	
92004	SC/APC		36	
92006	SC/UPC		36	
92002	LC/UPC		36	
91874	SC/APC		48	
92010	SC/UPC		48	
92008	LC/UPC		48	
93000	SC/UPC	OM4	12	
50079	LC/UPC		12	
93001	SC/UPC		24	
93002	LC/UPC		24	
93003	SC/UPC		36	
93004	LC/UPC		36	
93005	SC/UPC		48	
93006	LC/UPC		48	

Telenco

PN 15411



PN 92000

PN 92008

Available configurations:

Singlemode (G.652D, G.657A2):

SC/APC

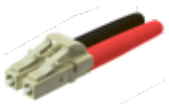
SC/UPC

LC/APC

LC/UPC

Multimode (OM3, OM4):

SC/PC



LC/UPC

Colours:

Patch panel:

Pigtail (Orange™ colour code):

Length: 2.5m

19" 1U Sliding patch panel - trunk version

PN	Connector type	Fibre type	Fibre count	Weight
92031	SC/APC	Singlemode	12	2.00kg
92032	SC/UPC		12	
92030	LC/UPC		12	
92169	SC/APC		24	
50075	SC/UPC		24	
50064	LC/UPC		24	
92034	SC/APC		36	
92035	SC/UPC		36	
92033	LC/UPC		36	
92036	SC/APC		48	
92037	SC/UPC		48	
50076	LC/UPC		48	
50063	SC/UPC	Multimode	12	
50078	LC/UPC		12	
93007	SC/UPC		24	
92984	LC/UPC		24	
93008	SC/UPC		36	
92985	LC/UPC		36	
93009	SC/UPC		48	
92986	LC/UPC		48	

PN 50064

Available configurations:

Singlemode (G.652D, G.657A2):

SC/APC

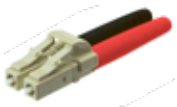
SC/UPC

LC/APC

LC/UPC

Multimode (OM3,OM4):

SC/PC



LC/UPC

Technical specifications:

Parameter	Specifications
Patch panel material	Corrosion-resistant treated steel
Patch panel colour	Grey
Dimensions (L x W x H)	201mm x 482mm x 44mm
Optical equipment	« Splicing » version: factory assembled optical connectors and pigtails « Trunk » version: factory assembled optical connectors
Splice trays	24 splices per splice tray
Fibre optic count	12FO, 24FO, 36FO, 48FO
Included accessories	Cage nuts and screws, heat-shrinkable splice protection sleeves, Rilsan cable ties
Patch panel protection	Cardboard packaging with cardboard lining and buffers

Optical specifications:

Parameter	Specifications			
Fibre type	G.652D	G.657A2	OM3	OM4
Cable colour	Yellow		Aqua	Magenta
IEC-61300	100% compliant			
Connector type	SC/APC, SC/UPC, LC/UPC, LC/APC			
Connector material	Body: Thermoplastic Ferrule: Zirconia			
Cable material	LSZH (Low Smoke Zero Halogen)			
Insertion Loss (IL)	Grade B ≤ 0.12dB on average and ≤ 0.25dB max for 97% of connections		≤ 0.30dB	
Return Loss (RL)	≥ 60dB (APC) and ≥ 50dB (UPC)		≥ 30dB	
Mechanical tests	Δ IL ≤ 0.20dB			
Environmental tests				
Temperature	Operation, transport and storage: -40° C / +60° C			

Telenco reserves the right to modify specifications without prior notice

1U Sliding patch panels - hybrid version

19" 1U Sliding patch panel - splicing version

PN	Type of copper connector	Number of connectors	Category	Type of optical connector	Fibre type	Fibre count	Weight
93010	RJ45	12	6A	SC/UPC	G.657A2	6FO	2.50kg
93011				SC/APC		6FO	
93012				Duplex LC/UPC		12FO	
93013				SC/PC	OM4	6FO	
93014				Duplex LC/UPC		12FO	

Telenco

PN 93012

Available configurations:

Colours:

Patch panel:

Pigtail (Orange™ colour code):

Length: 2.5m

Available configurations:

Singlemode (G.652D, G.657A2):

SC/APC

SC/UPC

LC/APC

LC/UPC

Multimode (OM3,OM4):

SC/PC

LC/UPC

RJ45:

Technical specifications:

Parameter	Specifications
Patch panel material	Corrosion-resistant treated steel
Patch panel colour	Grey
Dimensions (L x W x H)	201mm x 482mm x 44mm
Optical equipment	« Splicing » version: factory assembled optical connectors and pigtails « Trunk » version: factory assembled optical connectors
Splice trays	24 splices per splice tray
Fibre optic count	12FO
Number of RJ45 cores	12
Category of RJ45 cores	Cat 6, Cat 6A
Included accessories	Cage nuts and screws, heat-shrinkable splice protection sleeves, Rilsan cable ties
Patch panel protection	Cardboard packaging with cardboard lining and buffers

Optical specifications:

Parameter	Specifications			
Fibre type	G.652D	G.657A2	OM3	OM4
Cable colour	Yellow		Aqua	Magenta
IEC-61300	100% compliant			
Connector type	SC/APC, SC/UPC, LC/UPC, LC/APC			
Connector material	Body: Thermoplastic Ferrule: Zirconia			
Cable material	LSZH (Low Smoke Zero Halogen)			
Insertion Loss (IL)	Grade B ≤ 0.12dB on average and ≤ 0.25dB max for 97% of connections		≤ 0.30dB	
Return Loss (RL)	≥ 60dB (APC) and ≥ 50dB (UPC)		≥ 30dB	
Mechanical tests	Δ IL ≤ 0.20dB			
Environmental tests				
Temperature	Operation, transport and storage: -40° C / +60° C			

Telenco reserves the right to modify specifications without prior notice

19" Medium density solution

7HP Chassis

1U 7HP Chassis

PN	Size	Height	Number of modules	Weight
50033	19"	1U	3	2.00kg

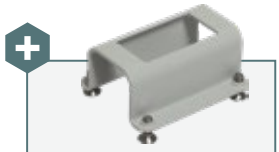
Characteristics:

Length: 221mm
Width: 427mm
Height: 44mm

7HP Modules

7HP Patching module

PN	Connector type	Number of connectors	Fibre type	Fibre count	Weight
91511	SC/APC	12	Singlemode	12	0.40kg
93015	SC/UPC	12		12	
92963	Duplex LC/UPC	6		12	
92964	Duplex LC/UPC	12		24	
93016	SC/PC	12	Multimode (OM3)	12	
92967	Duplex LC/UPC	6		12	
50038	Duplex LC/UPC	12		24	
93017	SC/PC	12	Multimode (OM4)	12	
92969	Duplex LC/UPC	6		12	
92900	Duplex LC/UPC	12		24	



Mounting kit for Optilink trunk

PN 50038

Characteristics:

Fibre type: Singlemode, Multimode (OM3, OM4)
Length: 175mm
Width: 35mm
Height: 129mm

COPPER CABLING

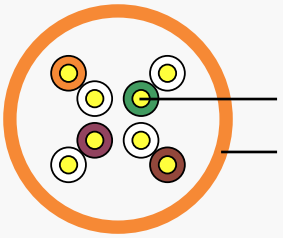
Shielding

The shielding is a protective layer placed inside the Ethernet cables' sheath. It enables the protection of cables against electromagnetic emissions. The choice of shielding depends on the level of electromagnetic disturbance in the environment in which the Ethernet cable will be used.

Shielding is defined by 4 letters:

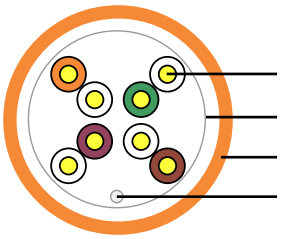
- U: Unfoiled (no shielding)
- F: Foiled (shielding with aluminum band)
- S: Shielded (shielding with copper braid)
- TP: Twisted Pairs (shielding with twisted pair)

The different types of shielding:



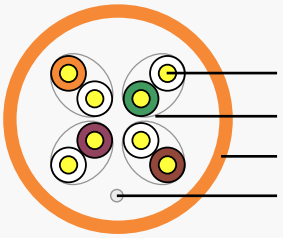
U/UTP

No shielding
This type of shielding is only used with Cat5E and Cat6.



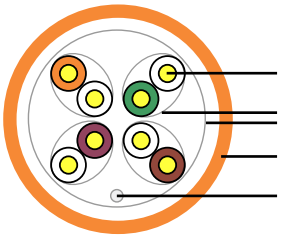
F/UTP

The cable's sheath is shielded with an aluminum band. This type of shielding enables to reduce the radiation of data transmission signals and the penetration of unwanted signals into the cable. This is the most commonly met type of shielding.



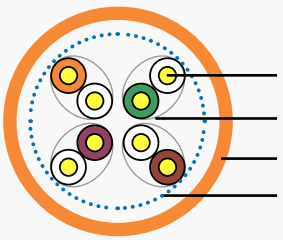
U/FTP

Each pair is individually shielded with an aluminum band.



F/FTP

The sheath and each pair are shielded with an aluminum band.

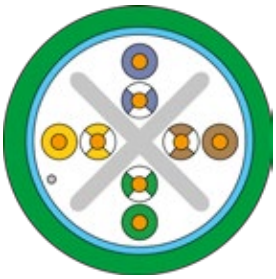


S/FTP

Double shielding: the sheath is shielded with a copper braid. Each pair is individually shielded with an aluminum band.

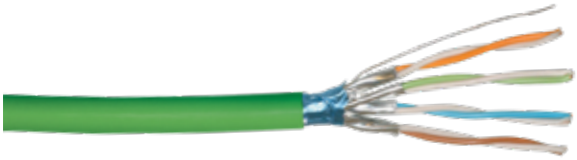
Ethernet cables

Cat6 F/UTP Ethernet cable



PN	Shielding	Category	Colour	Length	Weight
93018	F/UTP	6	Grey	500.0m	25.00kg

Cat6A F/FTP Ethernet cable



PN	Shielding	Category	Colour	Length	Weight
93019	F/UTP	6A	Grey	500.0m	40.00kg

The product's benefits:

+ Halogen free (LSZH)
+ Several available formats: "Box" cable reel 305m or classic cable reel 500m
+ Metric marking
+ 100% copper

Patching cords

The categories of RJ45 patchcords

The categories indicate the performance level of the RJ45 patchcords.

Categories	Characteristics		
	Maximum speed rate	Transmission frequency	Minimum shielding
Cat 5E	1Gbit/s	100MHz	U/UTP
Cat 6	1Gbit/s	250MHz	F/UTP
Cat 6A	10Gbit/s	500MHz	

Cat5E U/UTP RJ45 patchcord LSZH

PN	Length	Weight
93020	0.5m	0.02kg
93021	1.0m	0.05kg
93022	2.0m	0.10kg
6316	3.0m	0.15kg
93023	5.0m	0.25kg
5521	10.0m	0.50kg
93024	15.0m	0.75kg

Cat6 F/UTP RJ45 patchcord LSZH

PN	Length	Weight
93025	0.5m	0.02kg
93026	1.0m	0.05kg
93027	2.0m	0.10kg
93028	3.0m	0.15kg
93029	5.0m	0.25kg
93030	10.0m	0.50kg
93037	15.0m	0.75kg

Cat6A S/FTP RJ45 patchcord LSZH

PN	Length	Weight
93031	0.5m	0.02kg
93032	1.0m	0.05kg
93033	2.0m	0.10kg
93034	3.0m	0.15kg
93035	5.0m	0.25kg
15340	10.0m	0.50kg
93036	15.0m	0.75kg

The product's benefits:

+ 100% copper in 26AWG section
+ Available in U/UTP, F/UTP or S/FTP LSOH versions
+ Halogen free sheath LSZH

Characteristics:

Colours:

Standard:

On request:

PN 93027

Accessories for copper cabling

Keystone connector Cat6 F/UTP RJ45

PN	Connector type	Shielding	Category	Weight
93038	RJ45	F/UTP	6	0.02kg

Keystone connector Cat6A F/UTP RJ45

PN	Connector type	Shielding	Category	Weight
93039	RJ45	F/UTP	6A	0.02kg

45x45 Right output faceplate flap panel for 1 RJ45 port

PN	Port	Port number	Output	Weight
93040	RJ45	1	Right	0.03kg

45x45 Right output faceplate flap panel for 2 RJ45 ports

PN	Port	Port number	Output	Weight
93041	RJ45	2	Right	0.04kg

RACKS, WALL-MOUNTED CABINETS AND ACCESSORIES

19" Network racks

PN	Size	Height	Dimensions	Weight
93042	19"	42U	600x600mm	83.00kg
91352			600x800mm	94.00kg
93043			800x800mm	116.00kg

Available configurations:

Capacities: 21U, 27U, 42U

Colour:

Dedicated to local networks and IT applications

PN 91352

Technical specifications:

Categories	Specifications		
Rack type	600 x 600mm	600 x 800mm	800 x 800mm
Height	2100mm (42U)		
Structure	Mechanically welded		
Load limit	500kg As an option: 800kg		
Mounting posts	4 adjustable posts		
Front door	Removable safety glass As an option: full door, perforated		
Back door	Removable panel As an option: preformed door		
Side panels	Removable		
Support	Adjustable feet/wheels		
Cable routing	Top and bottom		
Included accessories	Screws, cage nuts and earthing kit		

Telenco reserves the right to modify specifications without prior notice

19" Wall-mounted optical closures

PN 93044

PN 93048

PN	Size	Height	Dimensions	Weight
93044	19"	6U	520x450mm	11.00kg
93045		9U	520x450mm	15.00kg
93046		12U	520x450mm	17.00kg
93047		9U	600x600mm	26.00kg
93048		12U	600x600mm	29.00kg

Available configurations:

Capacités: 6U, 9U, 12U

Colour:

Technical specifications:

Parameter	Specifications	
Optical closure type	520x450mm	600x600mm
Height	329mm (6U) 462mm (9U) 592mm (12U)	501mm (9U) 635mm (12U)
Load limit	30kg	60kg
Front door	Safety glass Door opening angle 180°	
Side panels	-	Removable
19" vertical panels	1 pair	2 pairs

Telenco reserves the right to modify specifications without prior notice

Accessories for 19" racks and optical closures

1U Patching panel RJ45 24 ports

PN	Size	Height	Weight
93049	19"	1U	1.35kg

1U Cable gland panel with brush

PN	Size	Height	Weight
91509	19"	1U	0.15kg

1U Cable guide

PN	Size	Height	Weight
93050	19"	1U	0.30kg

1U Shutter panel

PN	Size	Height	Weight
93051	19"	1U	0.15kg

1U Modem panel

PN	Size	Height	Weight
91510	19"	1U	1.50kg

2U Modem panel

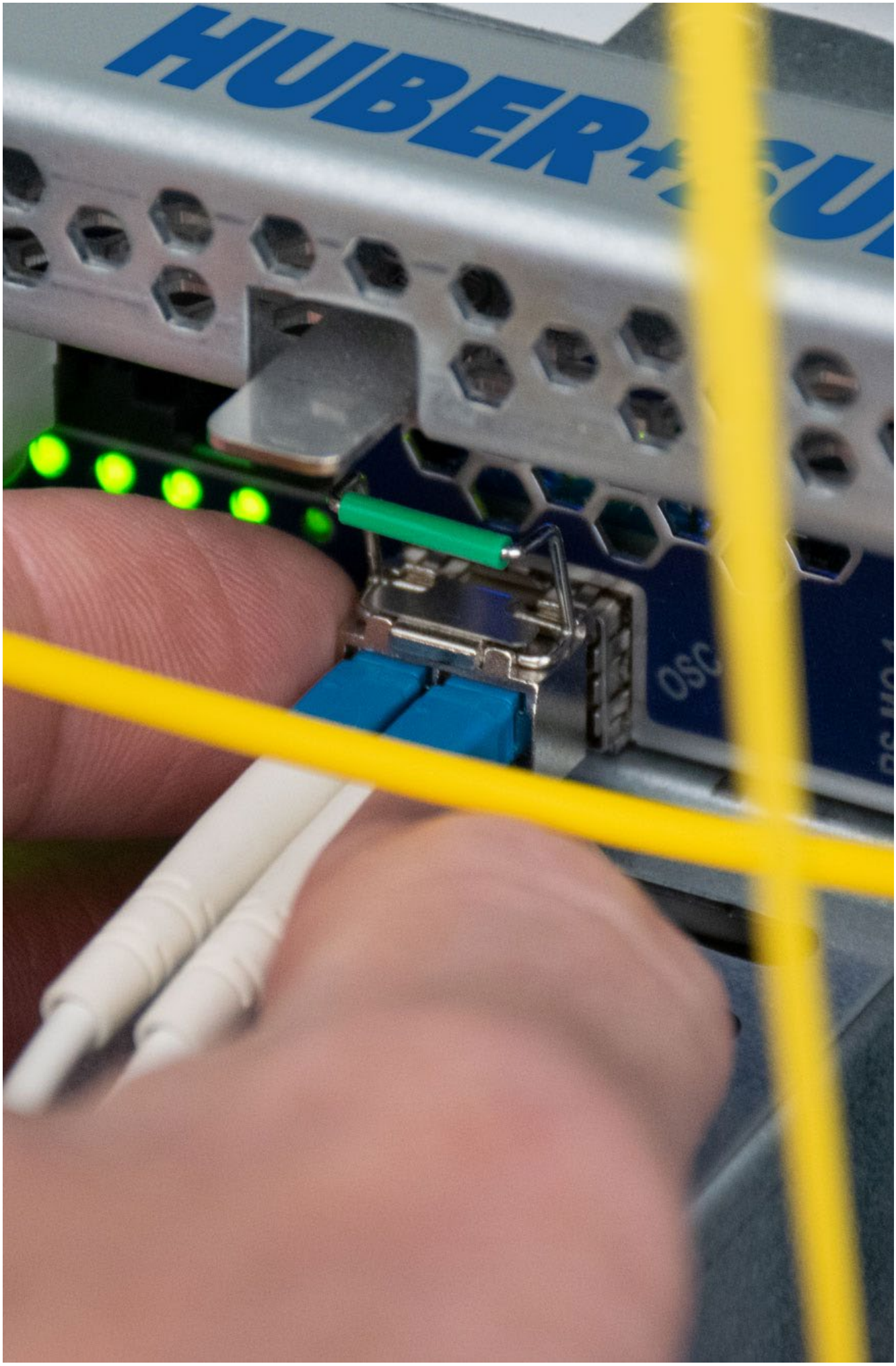
PN	Size	Height	Weight
93052	19"	2U	1.90kg

3U Rack mount DIN rail panel

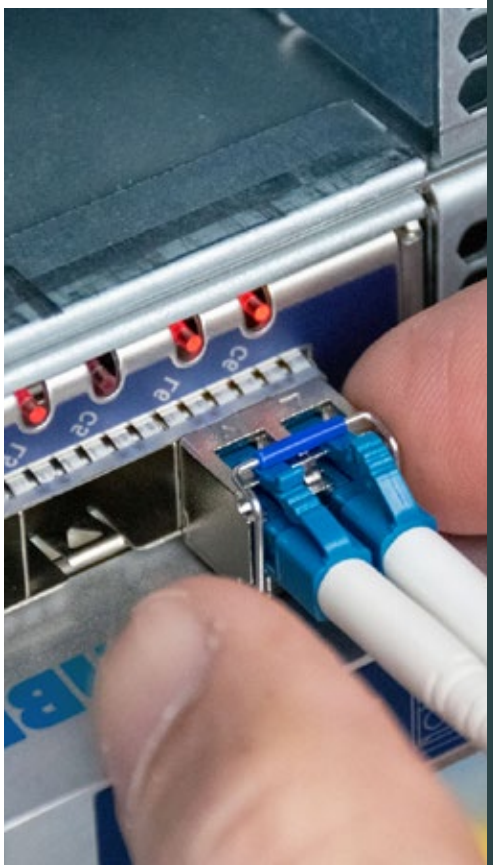
PN	Size	Height	Weight
93053	19"	3U	0.60kg

1U PDU with switch

PN	Size	Height	Weight
92288	19"	1U	1.00kg


HUBER+SU

Transceivers and Multiplexers



HUBER+SUHNER

Huber+Suhner Cube Optics®, a global player recognised for the quality and performance of its optical solutions, expert in fibre optic transmission solutions, offers a very wide range of optical modules (transceivers) covering:

- **All speeds: from 1Gbit/s to 400Gbit/s**
- **All services: Ethernet, Fibre Channel but also CPRI, eCPRI, STM-n**
- **All formats: SFP, SFP+, QSFP+, QSFP28, QSFP-DD, but also XFP, Xenpak, X2, CFP, CFP2 and so on.**
- **All media: 850nm multimode, 1310nm singlemode LR (10 km), 1550nm singlemode ER (40 km), DWDM, but also CWDM, ER4, ZR4**
- **Broadest compatibility with all major equipment brands**

Huber+Suhner Cube Optics® provides the most demanding customers with optical modules of unmatched quality, reliability and electrical and power performances on the market. For this, the company relies on its global team of experts, designers and producers of high-performance components for optical modules as well as on its qualification and testing laboratory located in Europe.

Huber+Suhner® also offers a broad range of CWDM and DWDM multiplexers for optical transmission applications from 0 to 200km.

TRANSCEIVERS

How to choose a transceiver (optical module) ?

The key issue is, of course, to identify the service to be transported.

Is it:

- Ethernet?
- Fibre Channel?
- Or other services such as SDH (STM-n) or CPRI (for cellular network radio heads)?

We will then specify the data rate, from 1 to 400Gbit/s.

These two elements determine the mechanical format of the optical module:

- SFP for 1Gbit/s Ethernet or 1/2/4G Fibre Channel
- SFP+ for 10Gbit/s Ethernet or 16G/32G Fibre Channel
- QSFP+ for 40Gbit/s Ethernet
- QSFP28 (more rarely CFP, CFP2) for 100Gbit/s Ethernet

Of course, this mechanical format must match with the «cage» offered by the service equipment.
The brand and model of this latter must be known in order to ensure perfect compatibility.
For instance, an optical module with a «Huawei» compatibility coding may not work when integrated into a Cisco equipment.

Then, the transmission characteristics must be specified. How far, using which type of optical fibre and according to which modality the optical signal will be transmitted?

For optical patchcords connecting two pieces of equipment of the same rack or room, the multimode «SR» short range and very economical transceiver may be a fine solution, even though datacenter operators are now favouring singlemode fibre.

For a campus-wide pair of optical link of a few kilometers, the singlemode "LR" (Long range) will be appropriate.

For a "metropolitan" transmission, we can use the "ER" (Extended Range) optical modules covering distances of up to 40km or "ZR" for up to 80km.

There are also the so-called "bidirectional optical modules" (and purchased by pair, the transmitters and receivers are being swapped) enabling the transmission on a single-strand fibre.

The distances mentioned here are indicative only, and it will be useful at a later stage to think in terms of optical budget required, taking into consideration the expected attenuation of the used fibre.
The Telenco and Huber+Suhner Cube Optics® pre-sales experts are available to help with this calculation.

Finally, as the long-distance fibre is often scarce and expensive, this one can be shared and more than one circuit can be transmitted over a single pair. That's the advantage of the Wavelength Division Multiplexing (WDM).

Its dense variant, the DWDM, will enable up to 40 or even 128 channels to be carried over a single fibre pair, with the use of a passive multiplexer. In this case, the optical modules will be "coloured", as they emit their signal at a very precise wavelength. Permissible wavelength are standardised by ITU-T G.694.1 (DWDM) and G.694.2 (CWDM). In this case, the required wavelength (sometimes called "channel" in DWDM) must be clearly specified for each optical module.

TRANSCEIVERS

Optical transceivers are used to transform the outgoing electrical information, from a service equipment (switch, router, DSLAM, OLT, etc.), into an optical information that can be transmitted via an optical fibre over a short, medium or long distance.

Transceivers are available in many mechanical versions ((SFP, SFP+, QSFP+, QSFP28 being the most common) standardised by industry agreements called Multi-Source Agreements (MSAs). The significant advantage of these optical modules is that they make the optical transmission independent of the service equipment.

In this way, the Ethernet port of a router does not need to know if the packets it transmits are intended to an equipment in the same rack or to another at 100km away. It simply has a standard "SFP cage" , in which we can integrate:

- Short-range multimode SFP (a couple of dozen of metres)
- Inter-building «LR» singlemode SFP (up to 10 km span)
- Long distance «grey» «ZR» SFP (up to 80 km span, one single circuit over a fibre pair)
- DWDM ZR «coloured» SFP (up to 80 km span, and potentially several dozen of multiplexed circuits over a single fibre pair)

The product's benefits:

+ Very large range of mechanical formats, spans, speeds and services
+ Compatibility coding for almost all the equipment available on the market
+ Targeted quality by the major operators with a return rate inferior to 0.01% in 2020
+ Reliability, optical and electrical performance, environmental robustness rigorously qualified and verified by one of a kind test laboratory, used in parallel for the development of advanced optical components.
Huber+Suhner Cube Optics® also supplies optical components to the largest manufacturers in the market.

HUBER+SUHNER

Available formats:


SFP


SFP+


QSFP+


QSFP 28

Technical specifications:

See Tables 1 and 2 below for related information.

Service		Format	Standard			
			SR (850nm MM)	LR (1310nm SM)	ER (1550nm SM)	ZR DWDM
			Fibre type			
			Multimode	Singlemode	Singlemode	Singlemode
			Theoretical span			
			< 300m	< 10km	< 40km	< 80km
Ethernet	1GE	SFP	CSM-300A08Dx-85	CSS-303A11Dx-13	CSS-329A19Dx-15	CSS-326A26Dx-cc
	10GE	SFP+	CSM-900A06Dx-85	CSS-900B09Dx-13	CSS-907A15Dx-15	CSS-851A23Dx-cc
	40GE	QSFP+	CQM-800A04Dx-85	CQS-800A08Dx-13	-	-
	100GE	QSFP28	CQM-900A04Dx-85	CQS-900A08Dx-13	-	-
Fibre Channel	1/2/4/8G FC	SFP+	CSM-850A06DB-85	CSS-801A05DB-13	CSS-802A14DB-34	CSS-851B23Dx-cc
	16G FC	SFP+	-	FTLX1471D3BCL-B	-	-

1

Compatibility	Code Dx-
Alcatel	DAL-
Cisco	DC-
Dell	DL-
Ericsson	DR-
Huawei	DU-
Juniper	DJ-
Nokia	DK-
Non codé	D0-

Please contact us for:

Arista, Brocade, Calix, Ciena, Extreme, Force10, Foundry, HPE, IBM, Intel, Nortel, Coriant, Transmode, others.

2

DWDM channels	Code -cc
	18 to 61

Example of a configuration:

Parameter	Specifications
Service	1GE Ethernet
Format	SFP
Standard	ZR DWDM
Fibre type	Singlemode
Theoretical span	< 80km
Compatibility	Ericsson
Dx code	DR-
DWDM channels	26
Reference	CSS-326A26DR-26

Other versions available on request:

Service	Format	Span
25GE, 50GE, 400GE (new)	Xenpak, X2, XFP	SR10, DWDM ER,
STM-n, CPRI, others (old or specific)	QSFP-DD, others	ER4, eLR4, others

MULTIPLEXERS

Wavelength Division Multiplexing or WDM enables multiple circuits to be transmitted over a single fibre or a pair of fibre, optimizing thus the use of leased fibres or cables in a similar situation.

Passive multiplexers accept at their input a certain number of «coloured» optical signals, i.e. emitted at a specific wavelength. They combine them passively and purely optically, while also ensuring isolation between adjacent channels.

These same signals then come out multiplexed over a single fibre. The reverse operation is called demultiplexing.

A distinction is often made between the «CWDM» (up to 18 circuits over a fibre pair) and the «DWDM» (up to 18 circuits over a fibre pair).

In combination with the coloured optical modules described above, passive multiplexers/demultiplexers enable the transmission of very high data rates over a single fibre or a pair of fibres, from 1Gbit/s to several Tbit/s, at very attractive costs over distances from a few dozen to more than a hundred of kilometers.

Numerous operators and companies use this technique to interconnect two datacenters, to collect traffic from network access equipment (DSLAMs, OLTs or radio sites), or to build a very high speed backbone between core network routers.

Huber+Suhner Cube Optics® provides a wide range of multiplexers/demultiplexers in an innovative format and for very high densities.

Product number	Multiplexer	Channels
E-101-27-A	DWDM	8
E-103-36-B	DWDM	16
E-109-20-A	DWDM	40

The product's benefits:

+ Wide range: CWDM, DWDM, from 1 to 128 ports
+ The highest density on the market: up to two 40-channel multiplexers/demultiplexers in 1U
+ Custom-tailored products: mechanical format, connectors, optical performance, multiplexing structure
+ Can be provided for an outdoor use, in splice boxes or for other non-standard formats

HUBER+SUHNER

How to choose a passive multiplexer?

For a point-to-point link, here are the selection criteria:

- The number of circuits: for a handful of circuits, the CWDM would suffice. For more than a dozen of circuits, DWDM is generally a better choice.
- The optical distance to reach and the data rate of the circuits to be transported: for reasons of thermal dissipation of the optical modules and chromatic dispersion, the maximum range decreases with the data rate. Thus, 10Gbit/s optical modules are generally limited to an optical budget of 23dB, i.e. about 80 km before multiplexing, whereas 1Gbit/s optical modules can be provided with optical budgets of over 40dB. Therefore, amplification might be required for 10Gbit/s circuits that need to be transported over distances of more than 50 km. This is only possible with DWDM.

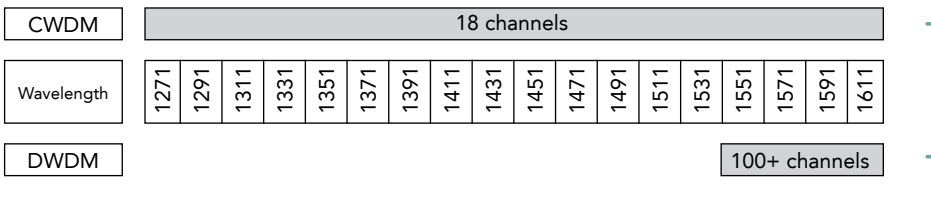
For a network including multiple links, intermediate sites or long distances, please contact the Telenco® and Huber+Suhner Cube Optics® sales teams. They will be able to suggest the most suitable solution.

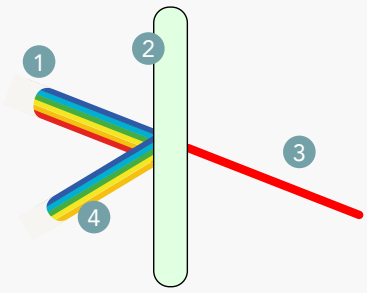
What is the basic principle of WDM?

The WDM is a method that makes it possible to combine (multiplexing) and separate (demultiplexing) optical signals of different wavelengths each.

What is the difference between CWDM and DWDM?

Coarse Wavelength Division Multiplexing (CWDM) and Dense Wavelength Division Multiplexing (DWDM) are two technologies developed from WDM. The main difference is the channel spacing, i.e. the wavelength difference between two adjacent optical channels.

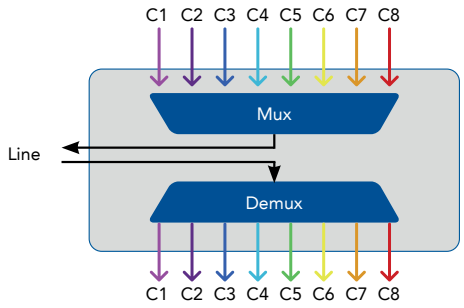




What is the basic principle of the thin film filter?

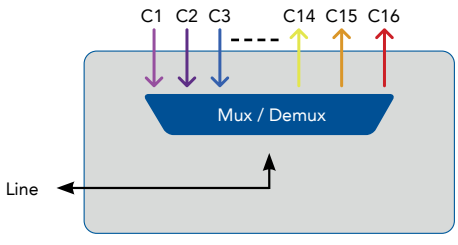
The thin film filter is a filtering technique that can be described as follows:
The incoming light 1 is directed onto a thin film filter 2.
The filter is transparent for a specific wavelength 3 and reflects all the other remaining wavelengths 4.
These filters are bi-directional and can be used to extract or insert a specific wavelength from/into the light beam. By cascading different filters, several channels can be multiplexed and/or demultiplexed.

What are the different types of multiplexers/demultiplexers?



Multiplexer/demultiplexer 1 fibre pair

Uses two separate fibre connections for the transmission (TX) and reception (RX). The number of wavelengths is therefore equal with the number of TX/RX channels.



Multiplexer/demultiplexer 1 single fibre

Requires a single fibre for the transmission (TX) and reception (RX). The number of required wavelengths is thus double than the number of TX/RX channels.

TELENCO: INNOVATION AT THE SERVICE OF WORLDWIDE NETWORKS

Telenco is a group of entities specialised in the design, manufacture and global marketing of future-proof solutions for telecom and connectivity infrastructures. Since 1999, the Group has organized its business activity on offering innovative solutions meeting the field challenges of each specific market.

A PROVEN EXPERTISE

DESIGN

Over 20 years
of R&D expertise and
an integrated test laboratory

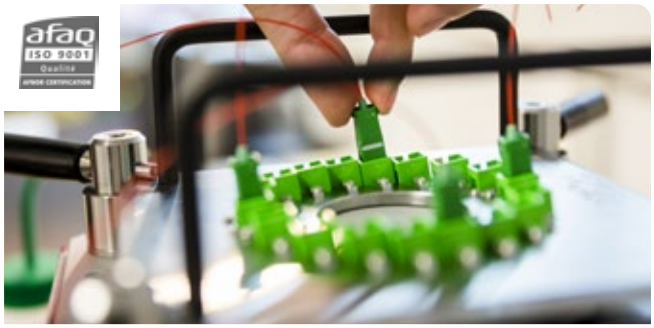
MANUFACTURE

18 000 m²
of production units
in Europe and Tunisia

LOGISTICS

21 000 m²
of storage area
in the world

A CERTIFIED INDUSTRIAL PLAYER...



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CREDO

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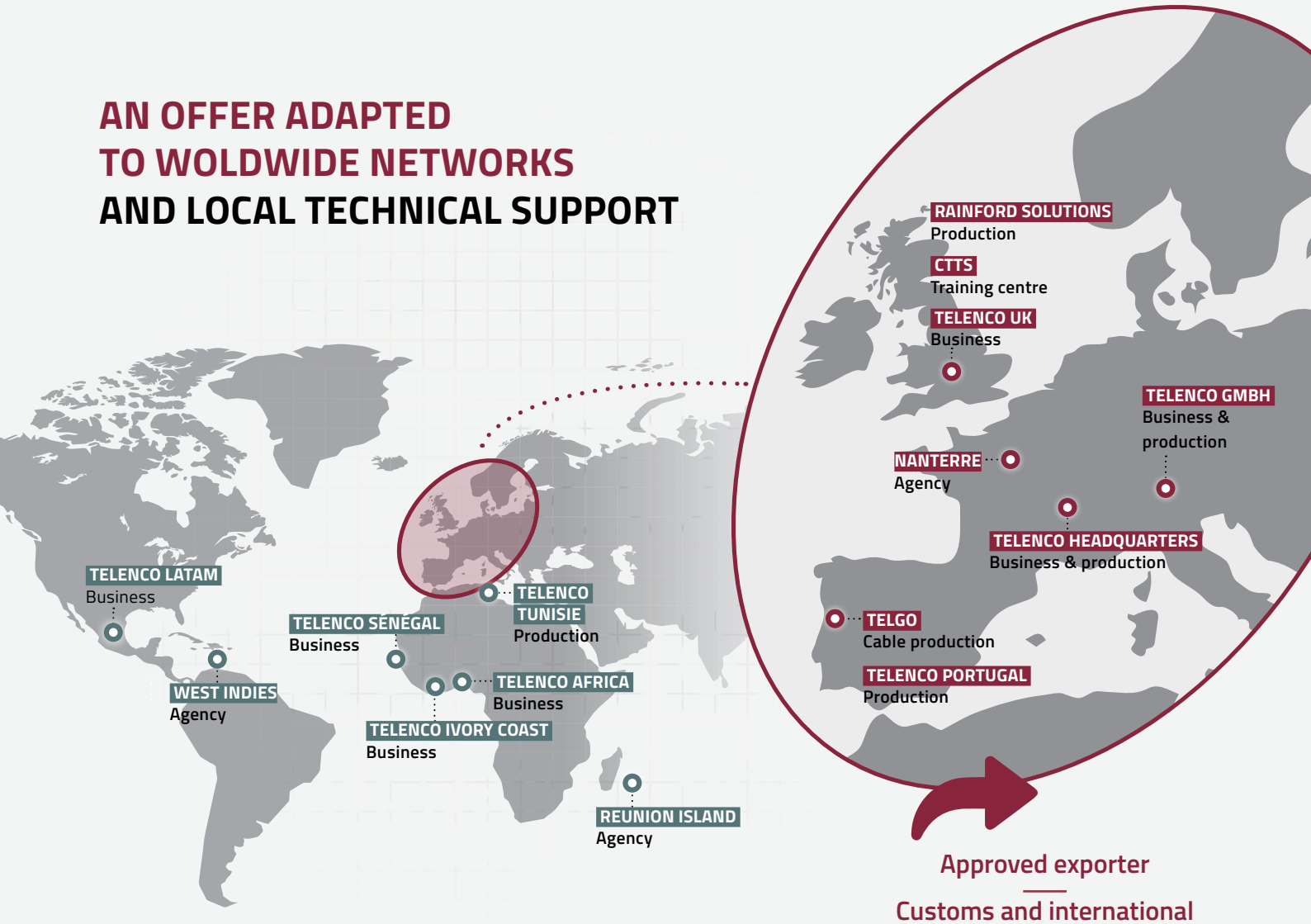
AN OFFER ADAPTED TO WOLDWIDE NETWORKS AND LOCAL TECHNICAL SUPPORT



Approved exporter

Customs and international transport expertise

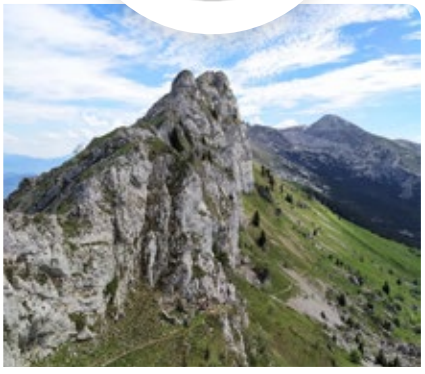
A RESPONSIBLE & SUSTAINABLE COMPANY

Committed to its employees, the environment and social inclusion

Discover all of our CSR actions on:

www.telenco-group.com

GOLD 2022 ecovadis Sustainability Rating



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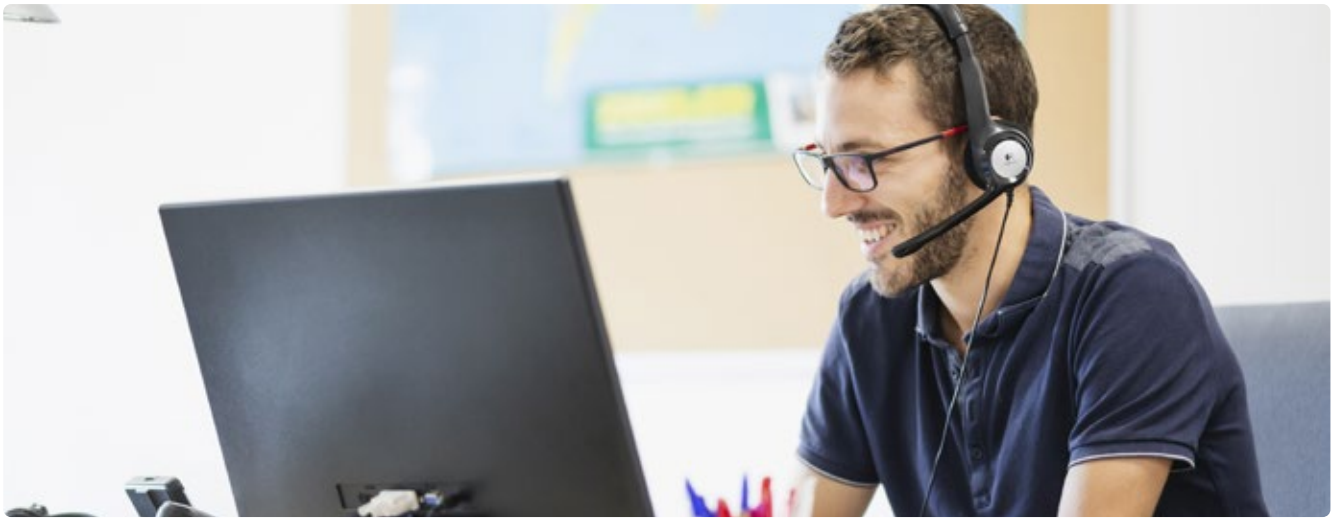

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