OPENLINE
FIBEROPTIC

Multi Line System:

Trunk Cable

New Generation Modules

Fanout

New Generation Fiber Enclosure

Multi Line System are conceived to supply a complete new set for the SAN connettivity.
The SAN are high speed networks, able to connect devices as servers, data storage equipments and switchs inside a dedicated environment, the Data Centers ones.
How to choose the best networking platform for a Data Center? We can analyze the fundamental elements for this choice.

Reliability

The network infrastructure plays a fundamental role in building and managing the Data Center or Server Farm and is as important as the other 'services' such as the continuity in the supply of energy, temperature control, access-control etc. Opting for a low quality product will compromise the performance of the Data Center.

Manageability

Large numbers of network equipment are connected to each other in a limited space due to the huge cost of such areas. It is therefore necessary to carry out high density cabling capable of managing both the distribution cable to the outside areas as well as the connecting patch cords to the equipment in a tidy and reliable way.
The user must maintain control of the cabling even when it has reached its maximum usage limit and must be able to access it at any point, even at its most critical and congested, without interrupting the service.

Scalability

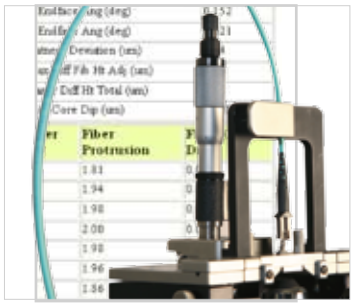
The network infrastructure must guarantee a company flexibility and speed.
Initially it must be sized to meet the real needs of the Data Center so that the investment is as cost effective as possible.
The cabling must follow the growth and evolution of the SAN especially if this is quick and unexpected.

High Performance

The continual increase in the speed of data transfer has led to new standards which limit the maximum channel insertion loss. This no longer depends exclusively on the optical power budget of the application but depends on the length of the channel and the bandwidth performance of the fiber. It is therefore fundamentally important that the connections guarantee high performance especially throughout time.

Multi Line system is a plug and play cabling platform, high density and modular, based on12 fiber compact MPO connections.
It is factory assembled and tested and does not require qualified personnel or costly equipment for the installation.

Multi Line System



Plug and play, installation steps

Lay the cables

Mount the panels in the Rack

Connect cable to modules and fanout

Patch to the equipment

Quick expansion scalability

12 channel modules (24 fibers)

24, 36, 48, 72, 96, 144 fiber trunks

New generation fiber enclosure 1HE accommodate up to 3 modules

New generation fiber enclosure 5HE accommodate up to 12 modules

System for rapid reconfiguration

High density and manageability

MPO push pull 12 fiber connector (12.6 x 7.6 mm)

Hardware with space saving dimensions

New generation fiber enclosure 1 HE for max 72 fibers

New generation fiber enclosure 5HE for max 288 fibers

Bend radius protection of fibers

High performance/Network efficiency

Allows easy migration to next generation technology

Available in low loss version

Multimode fiber optimised for 10 Gb/s transmissions

Factory tested and terminated

Quality control on all the productive processes

Cost Efficient

Rapid return of investment (ROI)

Reduced costs due to reduced space

Investment relates to real needs

Reduced installation time

Reduced waste, system completely re-installable

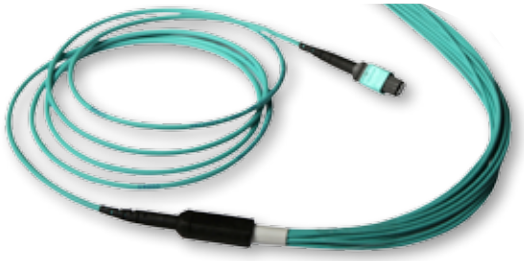
No need for specialised personnel for the installation

Trunk Cable

Multi Line system Trunk is a ready to use cabling platform, factory-terminated and factory tested to simplify and accelerate the installation process, without the need for specialised personnel or costly equipment.

It is based on high density MPO connectors with 12 fibers, providing a connectivity which is so compact that the smallest cable with a high fiber count can be used (up to 144 fibers OM1, OM2, OM3 e OS1/2).

The Trunks are available with two different cable variants:



The multi-unit design, composed of single round elements, 3mm in diameter, each one holding 12 fibers, allows greater flexibility compared with traditional ribbon cable; it does not require dividers and it is suitable for indoor use.

The loose tube design cable guarantees greater mechanical and environmental protection and can also be used outdoors, in this case a divider is necessary.

The connectorised ends are protected by a flexible tube which is removed once the cable has been laid; the cable is then ready to be connected to the modules and fanout.

In order to guarantee a bi-directional transmission of the channel the Trunk Standard Link uses a fiber pairwise flip polarity solution.

The Extending Link series is used to distribute connections of the Standard Link Trunk to other areas, in this other end are female MPO (pinless) an connected to the modules or fanout; as this is an extension the case the terminations are one-sided male MPO (pinned) an connected to the Standard Link trunk, the couples on the Extending Trunk are unflipped.

M	L	T	-	A	-	B	-	C	-	D	-	E	-	F	F	-	G	G	G

A Select cable type

S	=	Standard link end one MTP female, end two MTP female
E	=	Extending link end one MTP male, end two MTP female lato B MTP female

B Select a system performance

S	=	Standard
L	=	Low loss

C Select fiber count

1	=	12 fibers
2	=	24 fibers
3	=	36 fibers
4	=	48 fibers
7	=	72 fibers
9	=	96 fibers
C	=	144 fibers

D Select fiber type

9	=	Single mode 9/125 OS1
5	=	50/125 OM2
O	=	50/125 OM3 300
M	=	50/125 OM3 550
6	=	62,5/125 OM1

E Select cable design

M	=	Multi-unit micro cable, LSZH jacket
L	=	Loose tube cable, LSZH jacket
X	=	Outdoor cable available with rodent protection

F F Select fanout leg length*

A	A	=	Side A 700mm side B 700mm
B	B	=	Side A 1000mm side B 1000mm
C	C	=	Side A 1500mm side B 1500mm
D	D	=	Side A 2000mm side B 2000mm
x	x	=	for a complete list, please see jumper cable code

G G G Select cable length in meters

3	5		=	35 meters
1	2	5	=	125 meters

New Generation Module

Multi Line System

New Generation Module

New Generation Modules allow the transition of the MPO connections of the cable trunks in simplex or duplex connections with 12 or 24 fiber modularity, allowing the network infrastructure to easily support reconfiguration or growth.

One of the critical aspects of high density systems, where space is reduced to an absolute minimum, is manageability; the revolutionary system of basculant adaptors makes front access simple and safe even when the module has reached its maximum usage, eliminating any risk to the channels in use.

The module comes in one internal cabling wiring: used with standard patchcords it guarantees the bi-directional transmission of the channel thereby simplifying installation, moves and adds.

On the front of the modules there are LC, MU or SC connections for linking to telecommunication equipment or other distribution panels; at the rear the MPO connections are positioned to link up to MLS cable trunks.

NG Modules, factory-terminated and factory tested, are ready to use, eliminate preparation and connection time of the cable, and do not require costly instrumentation or qualified personnel for the installation.

M	L	-	N	G	M	-	A	-	B	B	-	C	-	D	D

A Seleziona livello di prestazioni

S = Standard
L = Low loss

B B Seleziona numero fibre

1 2 = 12 fibre
2 4 = 24 fibre

C Selezione tipo fibre

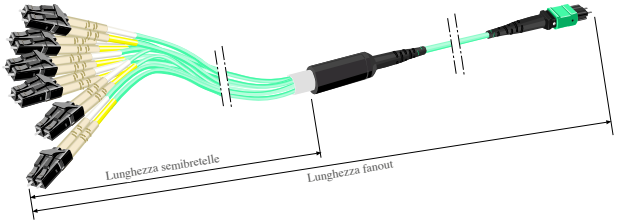
9 = Single mode 9/125 OS1
5 = 50/125 OM2
O = 50/125 OM3 300
M = 50/125 OM3 550
6 = 62,5/125 OM1

D D Seleziona connettore

4 8 = SC Duplex
5 8 = LC Duplex
6 0 = MU
7 0 = MT-RJ femmina
D D = Altri disponibili a richiesta

Multi Line System Fanout

Multi Line system Fanout is the ideal solution where it is not possible, due to lack of space, to install mechanical terminations or distribution panels in a rack, and allows direct connectivity to the electronic equipment.



Multi Line system Fanout transforms the MPO connections in the cable trunks into simplex or duplex connections: it is made up of a high density male MPO connector (pinned) for connecting to the trunks, a 12 fiber 3mm round cable which, as opposed to the flat ribbon cable, is safe from being bent or crushed from the side and maintains the same bend radius on all the axis: the divider is compact and resistant and separates the fibers into 12 smaller cables with a 2mm diameter which can then be connectorised with simplex or duplex connectors.

For the correct routing and management of the fibers it is possible for the client to define the total length of the the fanout and the fanout leg length in the order phase.

M	L	F	-	A	-	B	-	C	-	D	-	E	E	-	F	-	G	G	G

A Select a system performance

S	=	Standard
L	=	Low loss

B Select fiber count

4	=	4 fibers
8	=	8 fibers
x	=	12 fibers

C Select fiber type

9	=	Single mode 9/125 OS1
5	=	50/125 OM2
O	=	50/125 OM3 300
M	=	50/125 OM3 550
6	=	62,5/125 OM1

D Select cable design

R	=	Round cable 3 mm LSZH
F	=	Flat ribbon cable LSZH

E E Select connector type

4	8	=	SC Duplex
5	8	=	LC Duplex
7	0	=	MT-RJ female
E	E	=	for a complete list, please see jumper cable code

F Select fanout leg length

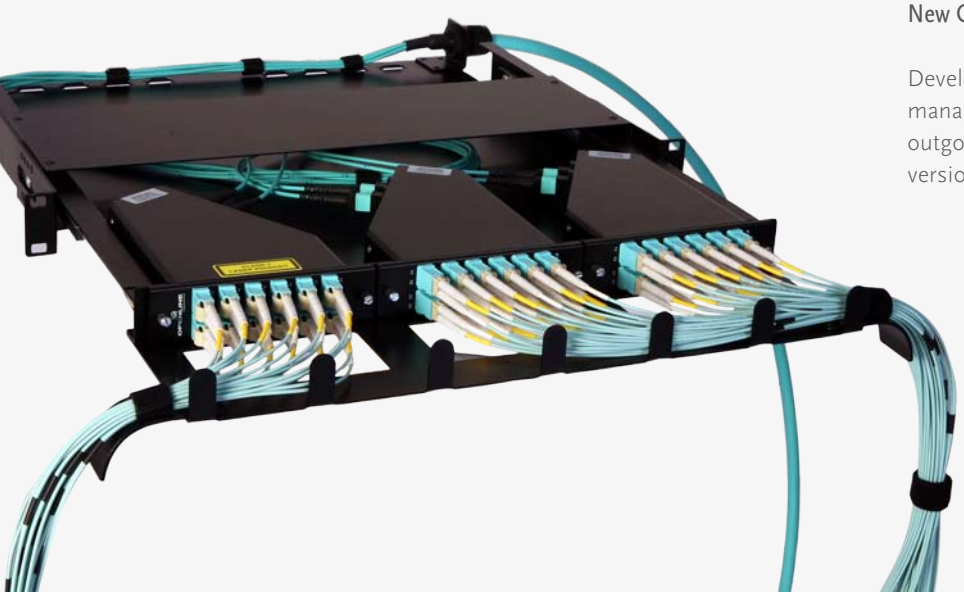
A	=	500 mm (-0 + 50)
B	=	700 mm (-0 + 50)
C	=	1000 mm (-0 + 50)
D	=	1500 mm (-0 + 50)
E	=	2000 mm (-0 + 50)

G G G Select fanout length in meters

3	-	5	=	3,5 meters
1	2		=	12 meters

New Generation Fiber Enclosure

Multi Line System



New Generation Fiber Enclosure

Developed to receive high density NGM modules and manage efficiently both the incoming trunk cable and the outgoing patchcords. Two versions are available: 5U fixed version or telescopic 1U..

NGE 5U

NGE 5U can accommodate up to 12 modules (288 fibers), the incoming bracket allows for the cable management from the bottom or top of the rack and an ample area stores the extra lengths of the fanout leg length of the trunks.
The patchcords are gathered on a shelf which protects them from being accidentally banged, and the adjustable bend radius limitors route them towards the electronic equipment.

Both versions come with adjustable mounting brackets which allow for recessed installation.

NGE 1U

NGE 1U can accommodate a maximum of 3 modules (72 fibers), the telescopic tray facilitates the intromission of the modules, the connection of the Trunks and of the patchcords, and the shelf protects the connections from accidental bangs.

New Generation Fiber Enclosure

Multi Line System

New Generation fiber Enclosure 1U

max 3 moduli

N	G	E	-	1	U	-	T	-	0	3	M

New Generation fiber Enclosure 5U

max 12 moduli

N	G	E	-	5	U	-	T	-	1	2	M

Fiber category ISO/IEC 11801 EN 50173		OM1	OM2	OM3	OS2
Standard and norms	IEC 60793-	2-10 A1b	2-10 A1a	2-10 A1a.2	2-50 B.1.3
	TIA-EIA ITU	492 AAAA	492 AAAB	492 AAAC	G.652.C
Geometrical characteristics					
Core diameter (µm)		62.5 ± 2.5	50 ± 2.5	50 ± 2.5	-
Cladding diameter (µm)		125 ± 1.0	125 ± 1.0	125 ± 1.0	125 ± 1.0
Coating diameter uncolored (µm)		242 ± 7	242 ± 7	242 ± 7	242 ± 7
Concentricity core/cladding (µm)		≤ 1.5	≤ 1.5	≤ 1.5	≤ 0.6
Mode-field diameter					
At 1310 nm (µm)		-	-	-	9.0 ± 0.4
At 1550 nm (µm)		-	-	-	10.1 ± 0.5
Attenuation					
850 dB/km		≤ 3.2	≤ 2.7	≤ 2.5	-
1300 dB/km		≤ 1.0	≤ 0.8	≤ 0.7	-
1310 dB/km		-	-	-	≤ 0.35
1383 dB/km		-	-	-	≤ 0.35
1550 dB/km		-	-	-	≤ 0.21
1625 dB/km		-	-	-	≤ 0.23
Bandwidth					
Overfilled launch (OFL)	850 nm	≥200 MHz/km	≥600 MHz/km	≥1500 MHz/km	-
	1300 nm	≥600 MHz/km	≥1.200 MHz/km	≥500 MHz/km	-
Effective laser launch *	850 nm	-	-	≥2000 MHz/km	-
Application links					
1Gb/s 850 nm (1000 BASE SX)		275 m	550 m	1100 m	-
1Gb/s 1300 nm (1000 BASE LX)		550 m	550 m	550 m	-
10Gb/s 850 nm (10 GBASE-SR)		30 m	80 m	300 m	-
10Gb/s 1300 nm (10 GBASE-LX4)		300 m	300 m	300 m	-

* Is assured using DMD, as specified in EN 60793-1-49

Connector		MPO	LC/PC	SC/PC	MU/PC
Compliance		IEC 61754-7 TIA 604-5	IEC 61754-20 TIA 604-10-A	IEC 61745-4 TIA 604-3	IEC 61754-6
Mech./therm. Performance					
Durability (remates)		500	1000	1000	1000
Operation temperature		-40° + 80 C	-40° + 80 C	-40° + 80 C	-40° + 80 C
Colour housing					
OM1 (62,5/125µm)		beige	beige	beige	brown
OM2 (50/125µm)		black	beige	beige	brown
OM3 (50/125µm)		aqua	beige	beige	brown
OS1-2 (9/125µm)		green	blue	blue	brown
Insertion loss					
Multimode	typical / max	0,20/0,50 dB	0,20/0,50 dB	0,20/0,50 dB	0,20/0,50 dB
Singlemode	typical / max	0,25/0,75 dB	0,15/0,40 dB	0,15/0,40 dB	0,15/0,40 dB
Low loss	typical / max	0,10/0,35 dB	0,08/0,15 dB	0,08/0,15 dB	0,08/0,15 dB
Return loss					
Multimode		> 20 dB	> 20 dB	> 20 dB	> 20 dB
Singlemode PC		-	≥ 50 dB	≥ 50 dB	≥ 50 dB
Singlemode APC		≥ 55 dB	≥ 65 dB	≥ 65 dB	≥ 65 dB