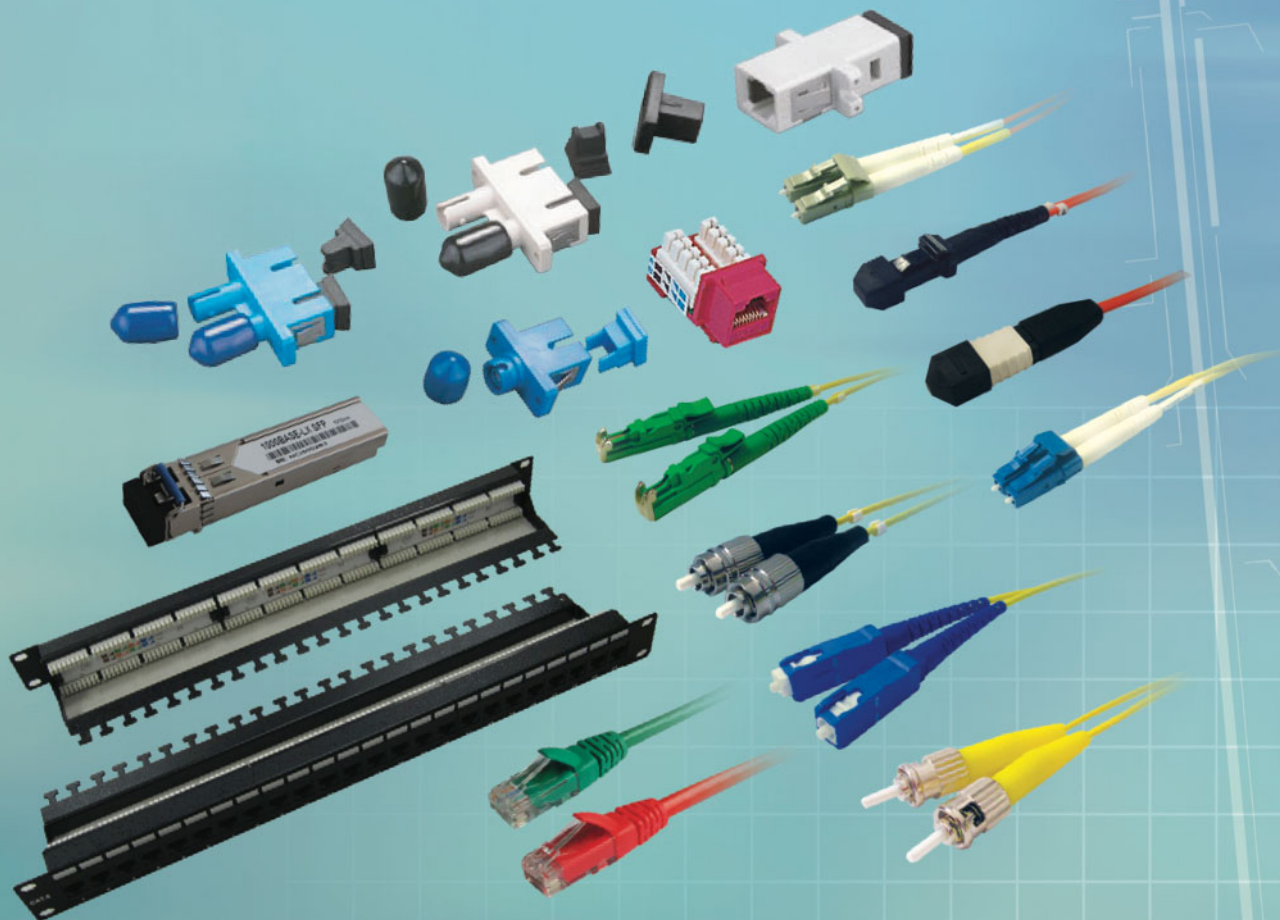




GIGA LAN Solutions

HAPP-ETEC

1973

HAPP Switzerland was founded in 1973 as a turned pin manufacturer for the watch and electronics industry.

1980

The first private label IC sockets were produced at HAPP 1980 and the product line was expanded over the following decade to a full range of IC sockets and interconnect products.

1992

The home brand E-tec was registered to cover HAPP's interconnect product range (IC sockets & connectors) and new offices in Switzerland, Germany, France, UK and Taiwan were set-up to promote this new brand name on a world-wide basis.

1999

The LAN product line (copper cables, fiber optic cables and LAN accessories) was added to the interconnect product portfolio.

2004

HAPP Switzerland is ISO 9001:2000 certified.

2005

The brand name HAPP-ETEC was officially allocated to this product line, in order to clearly separate the E-tec interconnect product business from the HAPP-ETEC LAN cabling business. Our office in Taiwan (HAPP & E-tec Taiwan Ltd) thus carries this dual product name as its official company name since 2005.

2006

HAPP & E-tec Taiwan Ltd is 9001:2000 certified.

Index

Contents

Page N°

	From	up To
Fiber Optic		
Fiber Optic General Information	4	
FO Standard Patch cord Duplex Multimode	6	7
FO Standard Patch cord Duplex Singlemode	8	10
FO Standard Patch cord General Info	5	
FO Standard Patch cord Simplex Singlemode	11	12
FO Standard Patch cord Specifications	17	
Light Tracer Patch cord Duplex Singlemode	15	16
Mode Conditioning Patch cord	25	26
MPO Fan-out Cable	19	20
MPO Fiber management	18	
MPO Pre-terminated Cable	22	
MPO Sliding Module	23	24
MPO Standard Patch Panel	21	
Pigtails Multimode	13	
Pigtails Singlemode	14	
Armored FO		
Armored Dispatching Cords Multimode	33	
Armored Dispatching Cords Singlemode	34	
Armored Dispatching Specifications	32	
Armored Patch cord Duplex Multimode	29	
Armored Patch cord Duplex Singlemode	30	31
Armored Patch cord General Information	27	28
Transceivers		
Gigabit Transceivers	35	37
FO Attenuators and Adapters		
Adapters for Fiber Optic	39	41
Attenuators for Fiber Optic	38	
FO Patch panels		
Patch Panel Sliding Type, 24 Port for FC, ST	42	
Patch Panel Sliding Type, Angled 8 Port for E2000, LC, MTRJ & SC	48	
Patch Panel Sliding Type, Horizontal 8 Port for LC Quad & SC Duplex	45	
Patch Panel Sliding Type, Ordering Code	49	
Patch Panel Sliding Type, Vertical 12 Port for LC Quad & SC Duplex	46	
Patch Panel Sliding Type, Vertical 24 Port for E2000, LC & MTRJ	43	
Patch Panel Sliding Type, Vertical 24 Port for LC Quad & SC Duplex	47	
Patch Panel Sliding Type, Vertical 24 Port for SC	44	
Patch Panel Universal Dual Plate Type for Fiber Optic	54	
Patch Panel Universal Dual Plate Type, Panel & Fiber Adapters	55	57
Sliding Patch Module	50	
Sliding Patch Module Plates	51	53
FO Wall Boxes		
Patch Panel, Cable Management Accessories	64	66
Wall Boxes Lockable Type, 12 Port for LC Quad & SC Duplex	62	
Wall Boxes Lockable Type, 18 Port for E2000, LC, MTRJ & SC	61	
Wall Boxes Lockable Type, 24 Port for FC, ST	60	
Wall Boxes Lockable Type, 36 Port for FC, ST	59	
Wall Boxes Lockable Type, 48 Port for FC, ST	58	
Wall Boxes Lockable Type, Ordering Code	63	
Copper Cables and Panels		
Cat 5e and Cat 6 Special Patch cord	70	
Cat 5e Standard Patch cord	68	69
Cat 6 Standard Patch cord	71	72
Copper Cable General Information	67	
Patch Cable Adapters	74	
Patch Panel for Copper	73	

Index

Order code	Description	Page N°			
		From	To	From	To
ADC-XX/XX-XX/XX-3xx-xxxM	Armored dispatching cords - Multimode - OM3	32	33		
ADC-XX/XX-XX/XX-5xx-xxxM	Armored dispatching cords - Multimode - OM2	32	33		
ADC-XX/XX-XX/XX-6xx-xxxM	Armored dispatching cords - Multimode - OM1	32	33		
ADC-XX/XX-XX/XX-9xx-xxxM	Armored dispatching cords - Singlemode - OS1 & OS1-APC	34	34		
APC-XX/XX-XX/XX-3xx-xx.xM	Armored patch cords - Multimode - OM3	29	29		
APC-XX/XX-XX/XX-5xx-xx.xM	Armored patch cords - Multimode - OM2	29	29		
APC-XX/XX-XX/XX-6xx-xx.xM	Armored patch cords - Multimode - OM1	29	29		
APC-XX/XX-XX/XX-9xx-xx.xM	Armored patch cords - Singlemode - OS1 & OS1-APC	30	31		
CBL-3-MF/R-xx.xM-XX/XX	Copper patch cords - Cat 5e - crossed cables - SSTP (shielded)	70	70		
CBL-3-MF-xx.xM-XX	Copper patch cords - Cat 5e - standard cables - SSTP (shielded)	68	69		
CBL-3-MU/R-xx.xM-XX/XX-N	Copper patch cords - Cat 5e - crossed cables - UTP (unshielded)	70	70		
CBL-3-MU-xx.xM-XX-2P-N	Copper patch cords - Cat 5e - special 2-pair style - UTP (unshielded)	70	70		
CBL-3-MU-xx.xM-XX-N	Copper patch cords - Cat 5e - standard cables - UTP (unshielded)	68	69		
CBL-6-MF-xx.xM-XX-LN	Copper patch cords - Cat 6 - standard cables - SFTP (shielded) - LSNH	71	72		
CBL-6-MU/R-xx.xM-XX/XX-N	Copper patch cords - Cat 6 - crossed cables - UTP (unshielded)	70	70		
CBL-6-MU-xx.xM-XX-X	Copper patch cords - Cat 6 - standard cables - UTP (unshielded)	71	72		
CMA-XX-XXXX	Cable management accessories	64	66		
FAD-XX/XX-XX/XX-XX-X	Fiber optic adapters	39	41	55	56
FAT-XX-XX/XX-x	Fiber optic attenuators	38	38		
FLT-XX/XX-XX/XX-9XX-xx.xM	Light tracer patch cords -Singlemode - OS1 & OS1-APC	15	16		
FMC-XX/XX-XX/XX-3X-xx.xM	Mode Conditioning cables - Multimode OM3	25	26		
FMC-XX/XX-XX/XX-5X-xx.xM	Mode Conditioning cables - Multimode OM2	25	26		
FMC-XX/XX-XX/XX-6X-xx.xM	Mode Conditioning cables - Multimode OM1	25	26		
FMF-X-XX/XX-3x-xx-xxxM	MPO Fan-out cables - Multimode - OM3	19	20		
FMF-X-XX/XX-5x-xx-xxxM	MPO Fan-out cables - Multimode - OM2	19	20		
FMF-X-XX/XX-6x-xx-xxxM	MPO Fan-out cables - Multimode - OM1	19	20		
FMF-X-XX/XX-9x-xx-xxxM	MPO Fan-out cables - Singlemode - OS1 & OS1-APC	19	20		
FMP-X/XX-X/XX-3-xx-xxxM	MPO Pre-terminated cables - Multimode - OM3	21	21		
FMP-X/XX-X/XX-5-xx-xxxM	MPO Pre-terminated cables - Multimode - OM2	21	21		
FMP-X/XX-X/XX-6-xx-xxxM	MPO Pre-terminated cables - Multimode - OM1	21	21		
FMP-X/XX-X/XX-9-xx-xxxM	MPO Pre-terminated cables - Singlemode - OS1 & OS1-APC	21	21		
FPC-XX/XX-XX/XX-3xX-xx.xM	Standard patch cords - Duplex Multimode - OM3	6	7		
FPC-XX/XX-XX/XX-5xX-xx.xM	Standard patch cords - Duplex Multimode - OM2	6	7		
FPC-XX/XX-XX/XX-6xX-xx.xM	Standard patch cords - Duplex Multimode - OM1	6	7		
FPC-XX/XX-XX/XX-9xD-xx.xM	Standard patch cords - Duplex Singlemode - OS1& OS1-APC	8	10		
FPC-XX/XX-XX/XX-9xS-xx.xM	Standard patch cords - Simplex Singlemode - OS1& OS1-APC	11	12		
FPT-XX/XX-3MS-xx.xM	Pigtails - Multimode OM3	13	13		
FPT-XX/XX-5MS-xx.xM	Pigtails - Multimode OM2	13	13		
FPT-XX/XX-6MS-xx.xM	Pigtails - Multimode OM1	13	13		
FPT-XX/XX-9SS-xx.xM	Pigtails - Singlemode - OS1 & OS1-APC	14	14		
GBIC-GLC-XX-XX-XXX	GBIC Transceivers	35	37		
ILC-x-X-XX-X-X	Copper patch panel accessories - In-line coupler	74	74		
KSJ-x-X-X-X-x-X	Copper patch panel accessories - Keystone Jacks	74	74		
LWB-12-S-LC/XX-XQ-XX-xx-X	Lockable wall boxes - single door style - LC quad adapters - 12 ports	62	62		
LWB-12-S-SC/XX-XD-XX-xx-X	Lockable wall boxes - single door style - SC duplex adapters - 12 ports	62	62		
LWB-18-S-E2/XX-XS-XX-xx-X	Lockable wall boxes - single door style - E2000 adapters - 18 ports	61	61		
LWB-18-S-LC/XX-XD-XX-xx-X	Lockable wall boxes - single door style - LC adapters - 18 ports	61	61		
LWB-18-S-MT/XX-XD-XX-xx-X	Lockable wall boxes - single door style - MTRJ adapters - 18 ports	61	61		
LWB-18-S-SC/XX-XS-XX-xx-X	Lockable wall boxes - single door style - SC adapters - 18 ports	61	61		
LWB-24-S-FC/XX-XS-XX-xx-X	Lockable wall boxes - single door style - FC adapters 24 ports	60	60		
LWB-24-S-ST/XX-XS-XX-xx-X	Lockable wall boxes - single door style - ST adapters 24 ports	60	60		
LWB-36-D-LC/XX-XQ-XX-xx-X	Lockable wall boxes - double door style - LC quad adapters - 36 ports	59	59		
LWB-36-D-SC/XX-XD-XX-xx-X	Lockable wall boxes - double door style - SC duplex adapters - 36 ports	59	59		
LWB-48-D-FC/XX-XS-XX-xx-X	Lockable wall boxes - double door style - FC adapters - 48 ports	58	58		
LWB-48-D-ST/XX-XS-XX-xx-X	Lockable wall boxes - double door style - ST adapters - 48 ports	58	58		
MPM-XX-xx-XX/XX-3	MPO Sliding module - Multimode - OM3	23	24		
MPM-XX-xx-XX/XX-5	MPO Sliding module - Multimode - OM2	23	24		
MPM-XX-xx-XX/XX-6	MPO Sliding module - Multimode - OM1	23	24		
MPM-XX-xx-XX/XX-9	MPO Sliding module - Singlemode - OS1 & OS1-APC	23	24		
MPP-xx-X-XX/XX-XX	Module patch plates for sliding module patch panels	51	53		
PLH-x-X-xx-X-x-x-X	Copper patch panels - horizontal dual-type jacks - unshielded type	73	73		
PLK-X-xx-1U-x-X	Copper & FO patch panels - vertical & horizontal keystone jacks + FO adapter - unshielded	54	54	73	73
PLV-x-X-xx-X-x-x	Copper patch panels - vertical dual-type jacks - shielded type	73	73		
SPM-3-X-ALL-XX-X	Sliding module patch panels - 3 modules base type	22	22	50	50
SPP-08-A-E2/XX-XS-XX-xx-X	Sliding patch panels - angled adapter position - E2000 adapters - 8 ports	48	48		
SPP-08-A-LC/XX-XD-XX-xx-X	Sliding patch panels - angled adapter position - LC adapters - 8 ports	48	48		
SPP-08-A-MT/XX-XD-XX-xx-X	Sliding patch panels - angled adapter position - MTRJ adapters - 8 ports	48	48		
SPP-08-A-SC/XX-XS-XX-xx-X	Sliding patch panels - angled adapter position - SC adapters - 8 ports	48	48		
SPP-08-H-LC/XX-XQ-XX-xx-X	Sliding patch panels - horizontal adapter position - LC quad adapters - 8 ports	45	45		
SPP-08-H-SC/XX-XD-XX-xx-X	Sliding patch panels - horizontal adapter position - SC duplex adapters - 8 ports	45	45		
SPP-12-V-LC/XX-XQ-XX-xx-X	Sliding patch panels - vertical adapter position - SC duplex adapters - 12 ports	46	46		
SPP-12-V-LC/XX-XQ-XX-xx-X	Sliding patch panels - vertical adapter position - LC quad adapters - 12 ports	46	46		
SPP-24-N-FC/XX-XS-XX-xx-X	Sliding patch panels - central adapter position - FC adapters - 24 ports	42	42		
SPP-24-N-ST/XX-XS-XX-xx-X	Sliding patch panels - central adapter position - ST adapters - 24 ports	42	42		
SPP-24-V-E2/XX-XS-XX-xx-X	Sliding patch panels - vertical adapter position - E2000 adapters - 24 ports	43	43		
SPP-24-V-LC/XX-XD-XX-xx-X	Sliding patch panels - vertical adapter position - LC adapters - 24 ports	43	43		
SPP-24-V-LC/XX-XQ-XX-xx-X	Sliding patch panels - vertical adapter position - LC quad adapters - 24 ports	47	47		
SPP-24-V-MT/XX-XD-XX-xx-X	Sliding patch panels - vertical adapter position - MTRJ adapters - 24 ports	43	43		
SPP-24-V-SC/XX-XS-XX-xx-X	Sliding patch panels - vertical adapter position - SC duplex adapters - 24 ports	47	47		
SPP-24-V-SC/XX-XS-XX-xx-X	Sliding patch panels - vertical adapter position - SC adapters - 24 ports	44	44		

Fiber Optic General Information

Fiber optic connectors

The fiber optic connectors are precision made and produced to very high quality standards. The alignment of the fiber inside the connector is a crucial point in the production process in order to ensure low light loss between the mating connectors. Besides, the ferrule needs to be highly polished also.

The body of the connector will lock the ferrule into an adapter and the ferrule is generally manufactured from ceramic, with the exception of the MTRJ and MPO connectors, which use a polymer ferrule instead.

The connectors are designed for fibers in multimode (62.5/125 μ m or 50/125 μ m) and singlemode (9/125 μ m fiber) versions, which are generally delivered in 900 μ m (pigtailed) and 1.80mm, 2mm or 3mm patch cables.

The first designs of fiber optic connectors (ST, FC) were produced with nickel plated brass bodies but the more recent generation connectors are plastic injection molded designs (SC, LC, MU, MTRJ, E2000).

Fiber optic cable assemblies

Fiber optic cable assemblies consist of a fiber optic cable which is mounted with a connector (on one or both ends). The critical part of the cable assembly is the manufacturing process and this will define the final quality of the cable assembly. The performance can be enhanced by the choice of the cable and the connector style, but the actual manufacturing process is key to a high quality product and which will avoid high insertion & low return losses in a fiber optic network.

Fiber optic adapters

Fiber optic patch cables are connected between each other with a fiber optic adapter and which is generally mounted in a wall box or a panel. This adapter will ensure correct alignment of the ferrules between each other. With the exception of the MTRJ connectors, the adapters generally contain two types of alignment sleeves, which come either in phosphor bronze (for general purpose application) or in ceramic (generally for singlemode only). For the MTRJ, the alignment feature is made with two alignment pins seated inside the connector itself and the adapter only supports and locks the connectors together.

Standard Patch Cords

Fiber optic patch cords need to be produced to the highest quality standards in order to guarantee a perfect network performance, which depends on the following three factors:

1. Connector type
2. Cable quality
3. Manufacturing quality

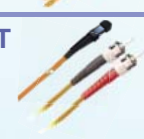
HAPP-ETEC only chooses the highest quality connector and cable types. Besides we have a very long term experience in manufacturing high quality fiber optic cable assemblies and which are only released after severe final QA control procedures. Each cable is delivered with an individual lot number and the final test result is printed on a sticker which is added on each individual plastic bag.

HAPP-ETEC offers a full product range adapted to any fiber optic network system, offering cable assemblies including all industry standard connector versions (FC, ST, SC, LC, E2000, MTRJ, MU) and all fiber styles (multimode and singlemode) in simplex and duplex versions.

Please contact HAPP-ETEC for any fiber optic cable requirement. We will be able to offer a solution to all your requirements.

Fiber Optic Patch Cable assemblies

Standard Patch Cords Duplex Multimode

		OM1 62.5/125μm orange color		OM2 50/125μm orange color		OM3 enhanced 50/125μm aqua blue color
E2000/E2000 	OM1	FPC-E2/PC-E2/PC-62D-xx.xM	LC/MTRJ 	OM1	FPC-LC/PC-MT/PC-61C-xx.xM	
	OM2	FPC-E2/PC-E2/PC-52D-xx.xM		OM2	FPC-LC/PC-MT/PC-51C-xx.xM	
	OM3	FPC-E2/PC-E2/PC-32D-xx.xM		OM3	FPC-LC/PC-MT/PC-31C-xx.xM	
E2000/FC 	OM1	FPC-E2/PC-FC/PC-62D-xx.xM	LC/SC 	OM1	FPC-LC/PC-SC/PC-62C-xx.xM	
	OM2	FPC-E2/PC-FC/PC-52D-xx.xM		OM2	FPC-LC/PC-SC/PC-52C-xx.xM	
	OM3	FPC-E2/PC-FC/PC-32D-xx.xM		OM3	FPC-LC/PC-SC/PC-32C-xx.xM	
E2000/LC 	OM1	FPC-E2/PC-LC/PC-62C-xx.xM	LC/ST 	OM1	FPC-LC/PC-ST/PC-62C-xx.xM	
	OM2	FPC-E2/PC-LC/PC-52C-xx.xM		OM2	FPC-LC/PC-ST/PC-52C-xx.xM	
	OM3	FPC-E2/PC-LC/PC-32C-xx.xM		OM3	FPC-LC/PC-ST/PC-32C-xx.xM	
E2000/MTRJ 	OM1	FPC-E2/PC-MT/PC-61D-xx.xM	MPO/SC 	OM1	FPC-MF/PC-SC/PC-62D-xx.xM	
	OM2	FPC-E2/PC-MT/PC-51D-xx.xM		OM2	FPC-MF/PC-SC/PC-52D-xx.xM	
	OM3	FPC-E2/PC-MT/PC-31D-xx.xM		OM3	FPC-MF/PC-SC/PC-32D-xx.xM	
E2000/SC 	OM1	FPC-E2/PC-SC/PC-62D-xx.xM	MPO/ST 	OM1	FPC-MF/PC-ST/PC-62D-xx.xM	
	OM2	FPC-E2/PC-SC/PC-52D-xx.xM		OM2	FPC-MF/PC-ST/PC-52D-xx.xM	
	OM3	FPC-E2/PC-SC/PC-32D-xx.xM		OM3	FPC-MF/PC-ST/PC-32D-xx.xM	
E2000/ST 	OM1	FPC-E2/PC-ST/PC-62D-xx.xM	MTRJ/MTRJ 	OM1	FPC-MT/PC-MT/PC-61D-xx.xM	
	OM2	FPC-E2/PC-ST/PC-52D-xx.xM		OM2	FPC-MT/PC-MT/PC-51D-xx.xM	
	OM3	FPC-E2/PC-ST/PC-32D-xx.xM		OM3	FPC-MT/PC-MT/PC-31D-xx.xM	
FC/FC 	OM1	FPC-FC/PC-FC/PC-62D-xx.xM	MTRJ/SC 	OM1	FPC-MT/PC-SC/PC-61D-xx.xM	
	OM2	FPC-FC/PC-FC/PC-52D-xx.xM		OM2	FPC-MT/PC-SC/PC-51D-xx.xM	
	OM3	FPC-FC/PC-FC/PC-32D-xx.xM		OM3	FPC-MT/PC-SC/PC-31D-xx.xM	
FC/LC 	OM1	FPC-FC/PC-LC/PC-62C-xx.xM	MTRJ/ST 	OM1	FPC-MT/PC-ST/PC-61D-xx.xM	
	OM2	FPC-FC/PC-LC/PC-52C-xx.xM		OM2	FPC-MT/PC-ST/PC-51D-xx.xM	
	OM3	FPC-FC/PC-LC/PC-32C-xx.xM		OM3	FPC-MT/PC-ST/PC-31D-xx.xM	
FC/MTRJ 	OM1	FPC-FC/PC-MT/PC-61D-xx.xM	SC/SC 	OM1	FPC-SC/PC-SC/PC-62D-xx.xM	
	OM2	FPC-FC/PC-MT/PC-51D-xx.xM		OM2	FPC-SC/PC-SC/PC-52D-xx.xM	
	OM3	FPC-FC/PC-MT/PC-31D-xx.xM		OM3	FPC-SC/PC-SC/PC-32D-xx.xM	
FC/SC 	OM1	FPC-FC/PC-SC/PC-62D-xx.xM	SC/ST 	OM1	FPC-SC/PC-ST/PC-62D-xx.xM	
	OM2	FPC-FC/PC-SC/PC-52D-xx.xM		OM2	FPC-SC/PC-ST/PC-52D-xx.xM	
	OM3	FPC-FC/PC-SC/PC-32D-xx.xM		OM3	FPC-SC/PC-ST/PC-32D-xx.xM	
LC/LC 	OM1	FPC-LC/PC-LC/PC-62C-xx.xM	ST/ST 	OM1	FPC-ST/PC-ST/PC-62D-xx.xM	
	OM2	FPC-LC/PC-LC/PC-52C-xx.xM		OM2	FPC-ST/PC-ST/PC-52D-xx.xM	
	OM3	FPC-LC/PC-LC/PC-32C-xx.xM		OM3	FPC-ST/PC-ST/PC-32D-xx.xM	
LC/MPO 	OM1	FPC-LC/PC-MF/PC-62C-xx.xM				
	OM2	FPC-LC/PC-MF/PC-52C-xx.xM				
	OM3	FPC-LC/PC-MF/PC-32C-xx.xM				

Replace "xx.x" by length in "meters"

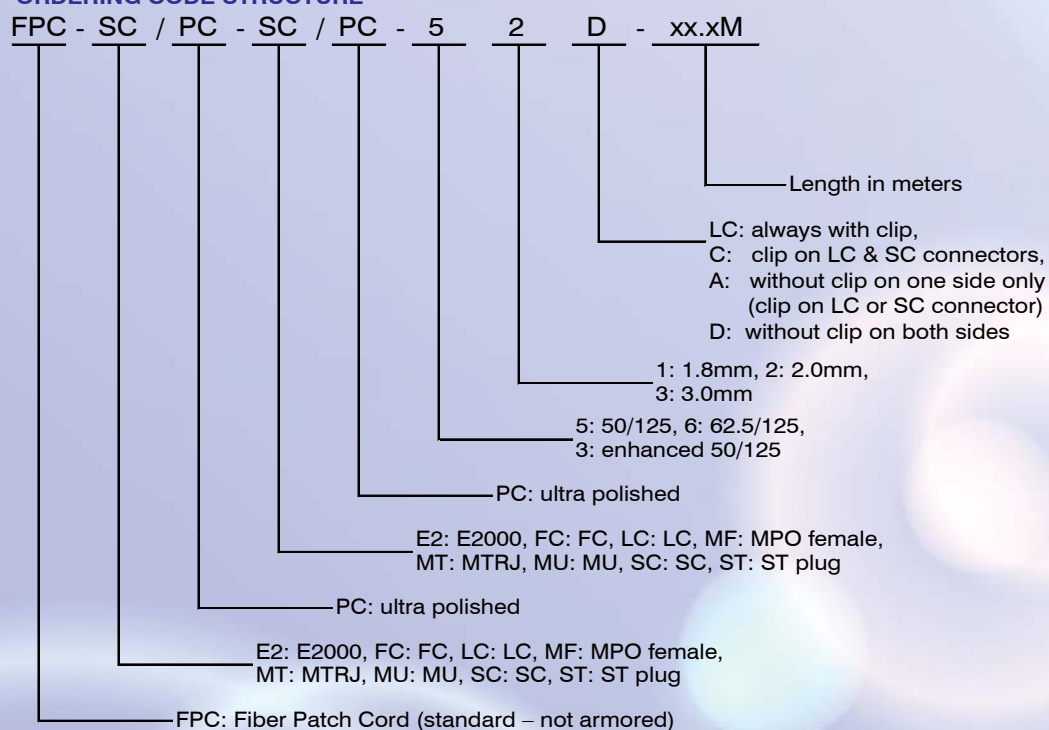
Standard Patch Cords

Duplex Multimode

OPTIONS

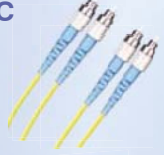
Cable length:	Replace "xx.x" by cable length in meter (example: 07.0 = 7 meter cable)		
Standard cable lengths:	1, 2, 3, 5 & 10 meters (others on demand)		
Cable diameter:	standard = 2.00mm (1.80mm for MTRJ) 3.00mm = on request		
Color:	OM1 & OM2	=	Orange (standard)
	OM3	=	Aqua Blue (standard)
	Other colors	=	on request

ORDERING CODE STRUCTURE



Fiber Optic Patch Cable assemblies

Standard Patch Cords Duplex Singlemode

		OS1 9/125μm (PC/PC) Yellow color	OS1-APC 9/125μm (APC/APC) Yellow color	Mixed: OS1-APC & OS1 9/125μm (APC/PC) Yellow color	
E2000/E2000 	OS1	FPC-E2/PC-E2/PC-92D-xx.xM	FC/MTRJ 	OS1	FPC-FC/PC-MT/PC-91D-xx.xM
	OS1-APC	FPC-E2/AP-E2/AP-92D-xx.xM		OS1-APC	
	Mixed	FPC-E2/AP-E2/PC-92D-xx.xM		Mixed	FPC-FC/AP-MT/PC-91D-xx.xM
E2000/FC 	OS1	FPC-E2/PC-FC/PC-92D-xx.xM	FC/MU 	OS1	FPC-FC/PC-MU/PC-92D-xx.xM
	OS1-APC	FPC-E2/AP-FC/AP-92D-xx.xM		OS1-APC	
	Mixed	FPC-E2/AP-FC/PC-92D-xx.xM		Mixed	FPC-FC/AP-MU/PC-92D-xx.xM
		FPC-E2/PC-FC/AP-92D-xx.xM			
E2000/LC 	OS1	FPC-E2/PC-LC/PC-92C-xx.xM	FC/SC 	OS1	FPC-FC/PC-SC/PC-92D-xx.xM
	OS1-APC	FPC-E2/AP-LC/AP-92C-xx.xM		OS1-APC	FPC-FC/AP-SC/AP-92D-xx.xM
	Mixed	FPC-E2/AP-LC/PC-92C-xx.xM		Mixed	FPC-FC/AP-SC/PC-92D-xx.xM
		FPC-E2/PC-LC/AP-92C-xx.xM			FPC-FC/PC-SC/AP-92D-xx.xM
E2000/MTRJ 	OS1	FPC-E2/PC-MT/PC-91D-xx.xM	LC/LC 	OS1	FPC-LC/PC-LC/PC-92C-xx.xM
	OS1-APC			OS1-APC	FPC-LC/AP-LC/AP-92C-xx.xM
	Mixed	FPC-E2/AP-MT/PC-91D-xx.xM		Mixed	FPC-LC/AP-LC/PC-92C-xx.xM
E2000/SC 	OS1	FPC-E2/PC-SC/PC-92D-xx.xM	LC/MPO 	OS1	FPC-LC/PC-MF/PC-92C-xx.xM
	OS1-APC	FPC-E2/AP-SC/AP-92D-xx.xM		OS1-APC	FPC-LC/AP-MF/AP-92C-xx.xM
	Mixed	FPC-E2/AP-SC/PC-92D-xx.xM		Mixed	FPC-LC/AP-MF/PC-92C-xx.xM
		FPC-E2/PC-SC/AP-92D-xx.xM			FPC-LC/PC-MF/AP-92C-xx.xM
E2000/ST 	OS1	FPC-E2/PC-ST/PC-92D-xx.xM	LC/MTRJ 	OS1	FPC-LC/PC-MT/PC-91C-xx.xM
	OS1-APC			OS1-APC	
	Mixed	FPC-E2/AP-ST/PC-92D-xx.xM		Mixed	FPC-LC/AP-MT/PC-91C-xx.xM
FC/FC 	OS1	FPC-FC/PC-FC/PC-92D-xx.xM	LC/MU 	OS1	FPC-LC/PC-MU/PC-92C-xx.xM
	OS1-APC	FPC-FC/AP-FC/AP-92D-xx.xM		OS1-APC	
	Mixed	FPC-FC/AP-FC/PC-92D-xx.xM		Mixed	FPC-LC/AP-MU/PC-92C-xx.xM
FC/LC 	OS1	FPC-FC/PC-LC/PC-92C-xx.xM	LC/SC 	OS1	FPC-LC/PC-SC/PC-92C-xx.xM
	OS1-APC	FPC-FC/AP-LC/AP-92C-xx.xM		OS1-APC	FPC-LC/AP-SC/AP-92C-xx.xM
	Mixed	FPC-FC/AP-LC/PC-92C-xx.xM		Mixed	FPC-LC/AP-SC/PC-92C-xx.xM
		FPC-FC/PC-LC/AP-92C-xx.xM			FPC-LC/PC-SC/AP-92C-xx.xM
FC/MPO 	OS1	FPC-FC/PC-MF/PC-92D-xx.xM	LC/ST 	OS1	FPC-LC/PC-ST/PC-92C-xx.xM
	OS1-APC	FPC-FC/AP-MF/AP-92D-xx.xM		OS1-APC	
	Mixed	FPC-FC/AP-MF/PC-92D-xx.xM		Mixed	FPC-LC/AP-ST/PC-92C-xx.xM
		FPC-FC/PC-MF/AP-92D-xx.xM			

Replace "xx.x" by length in "meters"

Standard Patch Cords Duplex Singlemode

		OS1 9/125μm (PC/PC) Yellow color	OS1-APC 9/125μm (APC/APC) Yellow color	Mixed: OS1-APC & OS1 9/125μm (APC/PC) Yellow color	
MPO/SC 	OS1	FPC-MF/PC-SC/PC-92D-xx.xM	MTRJ/ST 	OS1	FPC-MT/PC-ST/PC-91D-xx.xM
	OS1-APC	FPC-MF/AP-SC/AP-92D-xx.xM		OS1-APC	
	Mixed	FPC-MF/AP-SC/PC-92D-xx.xM		Mixed	
		FPC-MF/PC-SC/AP-92D-xx.xM			
MPO/ST 	OS1	FPC-MF/PC-ST/PC-92D-xx.xM	SC/SC 	OS1	FPC-SC/PC-SC/PC-92D-xx.xM
	OS1-APC			OS1-APC	FPC-SC/AP-SC/AP-92D-xx.xM
	Mixed	FPC-MF/AP-ST/PC-92D-xx.xM		Mixed	FPC-SC/AP-SC/PC-92D-xx.xM
MTRJ/MTRJ 	OS1	FPC-MT/PC-MT/PC-91D-xx.xM	SC/ST 	OS1	FPC-SC/PC-ST/PC-92D-xx.xM
	OS1-APC			OS1-APC	
	Mixed			Mixed	FPC-SC/AP-ST/PC-92D-xx.xM
MTRJ/SC 	OS1	FPC-MT/PC-SC/PC-91D-xx.xM	ST/ST 	OS1	FPC-ST/PC-ST/PC-92D-xx.xM
	OS1-APC			OS1-APC	
	Mixed	FPC-MT/PC-SC/AP-91D-xx.xM		Mixed	

Replace "xx.x" by length in "meters"

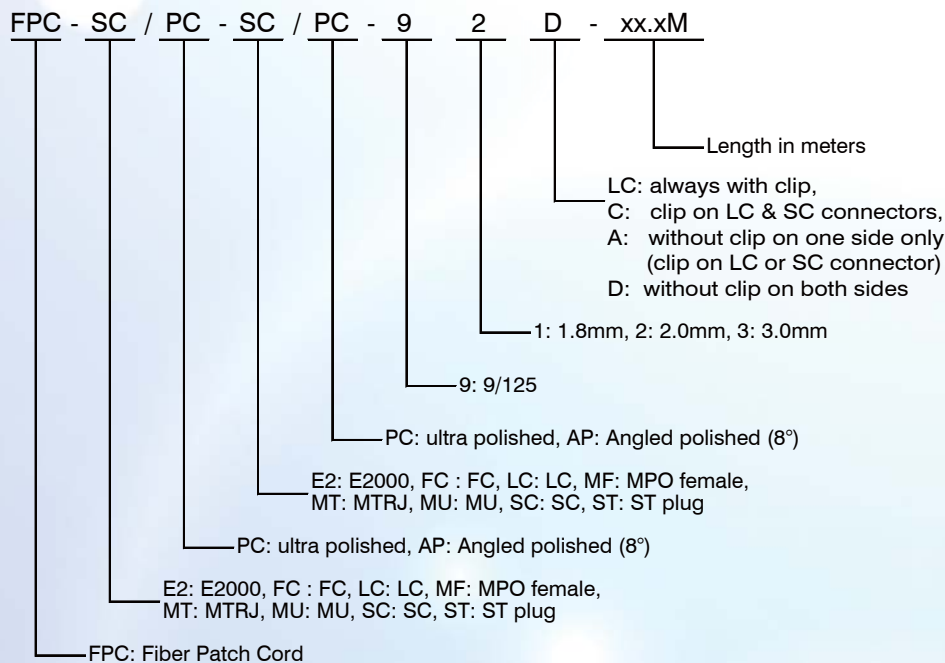
Fiber Optic Patch Cable assemblies

Standard Patch Cords Duplex Singlemode

OPTIONS

Cable length:	Replace "xx.x" by cable length in meter (example: 07.0 = 7 meter cable)
Standard cable lengths:	1, 2, 3, 5 & 10 meters (others on demand)
Cable diameter:	standard = 2.00mm (1.80mm for MTRJ) 3.00mm = option on request
Ultra polished OS1:	PC
Angled polished OS1-APC:	AP (only for E2000, FC, LC, SC)
Color:	Yellow (standard) Others (on request)

ORDERING CODE STRUCTURE



Standard Patch Cords

Simplex Singlemode

		OS1 9/125μm (PC/PC) Yellow color	OS1-APC 9/125μm (APC/APC) Yellow color	Mixed: OS1-APC & OS1 9/125μm (APC/PC) Yellow color	
E2000/E2000 	OS1	FPC-E2/PC-E2/PC-92S-xx.xM	FC/SC 	OS1	FPC-FC/PC-SC/PC-92S-xx.xM
	OS1-APC	FPC-E2/AP-E2/AP-92S-xx.xM		OS1-APC	FPC-FC/AP-SC/AP-92S-xx.xM
	Mixed	FPC-E2/AP-E2/PC-92S-xx.xM		Mixed	FPC-FC/AP-SC/PC-92S-xx.xM
		FPC-FC/PC-SC/AP-92S-xx.xM			
E2000/FC 	OS1	FPC-E2/PC-FC/PC-92S-xx.xM	LC/LC 	OS1	FPC-LC/PC-LC/PC-92S-xx.xM
	OS1-APC	FPC-E2/AP-FC/AP-92S-xx.xM		OS1-APC	FPC-LC/AP-LC/AP-92S-xx.xM
	Mixed	FPC-E2/AP-FC/PC-92S-xx.xM		Mixed	FPC-LC/AP-LC/PC-92S-xx.xM
		FPC-E2/PC-FC/AP-92S-xx.xM			
E2000/LC 	OS1	FPC-E2/PC-LC/PC-92S-xx.xM	LC/MU 	OS1	FPC-LC/PC-MU/PC-92S-xx.xM
	OS1-APC	FPC-E2/AP-LC/AP-92S-xx.xM		OS1-APC	
	Mixed	FPC-E2/AP-LC/PC-92S-xx.xM		Mixed	FPC-LC/AP-MU/PC-92S-xx.xM
		FPC-E2/PC-LC/AP-92S-xx.xM			
E2000/SC 	OS1	FPC-E2/PC-SC/PC-92S-xx.xM	LC/SC 	OS1	FPC-LC/PC-SC/PC-92S-xx.xM
	OS1-APC	FPC-E2/AP-SC/AP-92S-xx.xM		OS1-APC	FPC-LC/AP-SC/AP-92S-xx.xM
	Mixed	FPC-E2/AP-SC/PC-92S-xx.xM		Mixed	FPC-LC/AP-SC/PC-92S-xx.xM
		FPC-E2/PC-SC/AP-92S-xx.xM			
E2000/ST 	OS1	FPC-E2/PC-ST/PC-92S-xx.xM	LC/ST 	OS1	FPC-LC/PC-ST/PC-92S-xx.xM
	OS1-APC			OS1-APC	
	Mixed	FPC-E2/AP-ST/PC-92S-xx.xM		Mixed	FPC-LC/AP-ST/PC-92S-xx.xM
FC/FC 	OS1	FPC-FC/PC-FC/PC-92S-xx.xM	SC/SC 	OS1	FPC-SC/PC-SC/PC-92S-xx.xM
	OS1-APC	FPC-FC/AP-FC/AP-92S-xx.xM		OS1-APC	FPC-SC/AP-SC/AP-92S-xx.xM
	Mixed	FPC-FC/AP-FC/PC-92S-xx.xM		Mixed	FPC-SC/AP-SC/PC-92S-xx.xM
FC/LC 	OS1	FPC-FC/PC-LC/PC-92S-xx.xM	SC/ST 	OS1	FPC-SC/PC-ST/PC-92S-xx.xM
	OS1-APC	FPC-FC/AP-LC/AP-92S-xx.xM		OS1-APC	
	Mixed	FPC-FC/AP-LC/PC-92S-xx.xM		Mixed	FPC-SC/AP-ST/PC-92S-xx.xM
		FPC-FC/PC-LC/AP-92S-xx.xM			
FC/MU 	OS1	FPC-FC/PC-MU/PC-92S-xx.xM	ST/ST 	OS1	FPC-ST/PC-ST/PC-92S-xx.xM
	OS1-APC			OS1-APC	
	Mixed	FPC-FC/AP-MU/PC-92S-xx.xM		Mixed	

Replace "xx.x" by length in "meters"

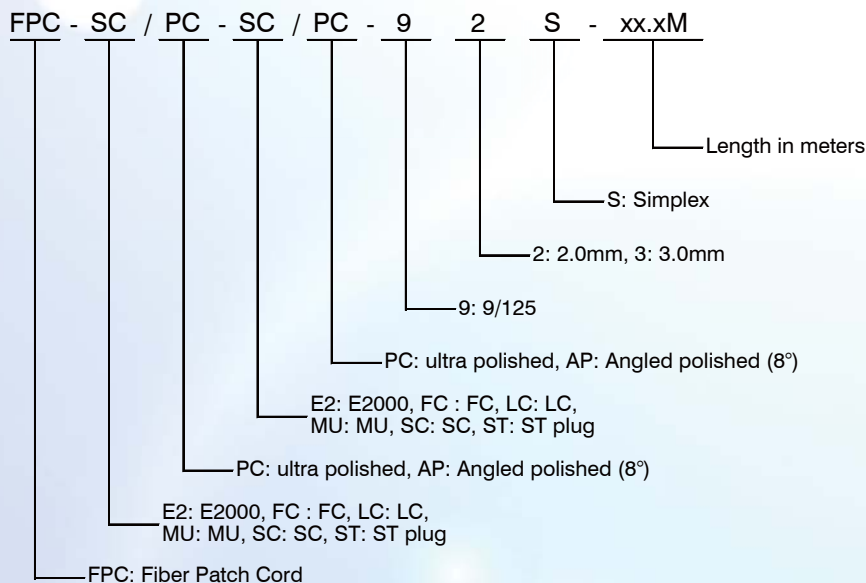
Fiber Optic Patch Cable assemblies

Standard Patch Cords Simplex Singlemode

OPTIONS

Cable length:	Replace "xx.x" by cable length in meter (example: 07.0 = 7 meter cable)
Standard cable lengths:	1, 2, 3, 5 & 10 meters (others on demand)
Cable diameter:	standard = 2.00mm 3.00mm = option on request
Ultra polished OS1:	PC
Angled polished OS1-APC:	AP (only for E2000, FC, LC, SC)
Color:	Yellow (standard) Others (on request)

ORDERING CODE STRUCTURE



Standard Pigtails

Pigtails Multimode

		OM1 62.5/125μm		OM2 50/125μm		OM3 enhanced 50/125μm
E2000 	OM1	<u>FPT-E2/PC -6MS-xx.xM</u>	SC 	OM1	<u>FPT-SC/PC-6MS-xx.xM</u>	
	OM2	<u>FPT-E2/PC-5MS-xx.xM</u>		OM2	<u>FPT-SC/PC-5MS-xx.xM</u>	
	OM3	<u>FPT-E2/PC-3MS-xx.xM</u>		OM3	<u>FPT-SC/PC-3MS-xx.xM</u>	
FC 	OM1	<u>FPT-FC/PC-6MS-xx.xM</u>	ST 	OM1	<u>FPT-ST/PC-6MS-xx.xM</u>	
	OM2	<u>FPT-FC/PC-5MS-xx.xM</u>		OM2	<u>FPT-ST/PC-5MS-xx.xM</u>	
	OM3	<u>FPT-FC/PC-3MS-xx.xM</u>		OM3	<u>FPT-ST/PC-3MS-xx.xM</u>	
LC 	OM1	<u>FPT-LC/PC-6MS-xx.xM</u>				
	OM2	<u>FPT-LC/PC-5MS-xx.xM</u>				
	OM3	<u>FPT-LC/PC-3MS-xx.xM</u>				

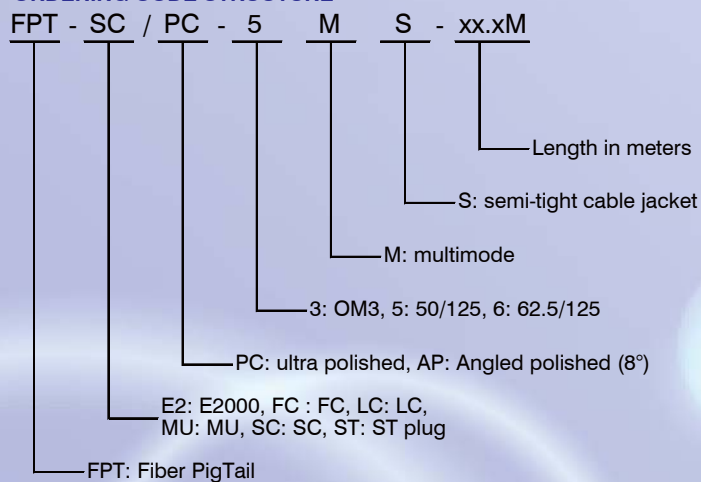
Replace "xx.x" by length in "meters"

OPTIONS

Cable length:

Replace "xx.x" by cable length in meter
(example: 02.0 = 2 meter cable)

ORDERING CODE STRUCTURE



Fiber Optic Patch Cable assemblies

Standard Pigtails Pigtails Singlemode

		OS1 9/125 μ m (PC)				OS1-APC 9/125 μ m (APC)
E2000		OS1 FPT-E2/PC-9SS-xx.xM	MU		OS1 FPT-MU/PC-9SS-xx.xM	
		OS1-APC FPT-E2/AP-9SS-xx.xM			OS1-APC	
FC		OS1 FPT-FC/PC-9SS-xx.xM	SC		OS1 FPT-SC/PC-9SS-xx.xM	
		OS1-APC FPT-FC/AP-9SS-xx.xM			OS1-APC FPT-SC/AP-9SS-xx.xM	
LC		OS1 FPT-LC/PC-9SS-xx.xM	ST		OS1 FPT-ST/PC-9SS-xx.xM	
		OS1-APC FPT-LC/AP-9SS-xx.xM			OS1-APC	

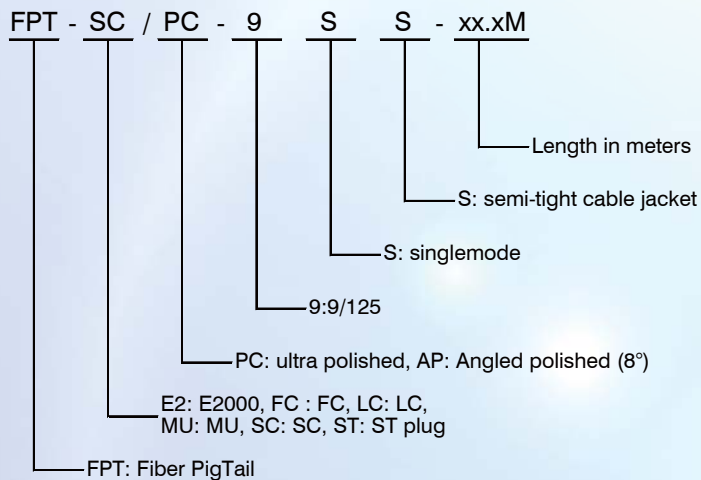
Replace "xx.x" by length in "meters"

OPTIONS

Cable length:

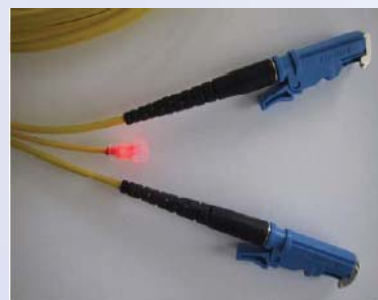
Replace "xx.x" by cable length in meter
(example: 02.0 = 2 meter cable)

ORDERING CODE STRUCTURE



Light Tracer Patch Cords

Duplex Singlemode



Connector Combination	OS1 9/125μm (PC/PC) Yellow color	OS1-APC 9/125μm (APC/APC) Yellow color	Mixed: OS1-APC & OS1 9/125μm (APC/APC) Yellow color
E2000/E2000	FLT-E2/PC-E2/PC-9LD-xx.xM	FLT-E2/AP-E2/AP-9LD-xx.xM	FLT-E2/AP-E2/PC-9LD-xx.xM
E2000/FC	FLT-E2/PC-FC/PC-9LD-xx.xM	FLT-E2/AP-FC/AP-9LD-xx.xM	FLT-E2/AP-FC/PC-9LD-xx.xM FLT-E2/PC-FC/AP-9LD-xx.xM
E2000/LC	FLT-E2/PC-LC/PC-9LC-xx.xM	FLT-E2/AP-LC/AP-9LC-xx.xM	FLT-E2/AP-LC/PC-9LC-xx.xM FLT-E2/PC-LC/AP-9LC-xx.xM
E2000/MTRJ	FLT-E2/PC-MT/PC-9LD-xx.xM		FLT-E2/AP-MT/PC-9LD-xx.xM
E2000/SC	FLT-E2/PC-SC/PC-9LD-xx.xM	FLT-E2/AP-SC/AP-9LD-xx.xM	FLT-E2/AP-SC/PC-9LD-xx.xM FLT-E2/PC-SC/AP-9LD-xx.xM
E2000/ST	FLT-E2/PC-ST/PC-9LD-xx.xM		FLT-E2/AP-ST/PC-9LD-xx.xM
FC/FC	FLT-FC/PC-FC/PC-9LD-xx.xM	FLT-FC/AP-FC/AP-9LD-xx.xM	FLT-FC/AP-FC/PC-9LD-xx.xM
FC/LC	FLT-FC/PC-LC/PC-9LC-xx.xM	FLT-FC/AP-LC/AP-9LC-xx.xM	FLT-FC/AP-LC/PC-9LC-xx.xM FLT-FC/PC-LC/AP-9LC-xx.xM
FC/MTRJ	FLT-FC/PC-MT/PC-9LD-xx.xM		FLT-FC/AP-MT/PC-9LD-xx.xM
FC/MU	FLT-FC/PC-MU/PC-9LD-xx.xM		FLT-FC/AP-MU/PC-9LD-xx.xM
FC/SC	FLT-FC/PC-SC/PC-9LD-xx.xM	FLT-FC/AP-SC/AP-9LD-xx.xM	FLT-FC/AP-SC/PC-9LD-xx.xM FLT-FC/PC-SC/AP-9LD-xx.xM
LC/LC	FLT-LC/PC-LC/PC-9LC-xx.xM	FLT-LC/AP-LC/AP-9LC-xx.xM	FLT-LC/AP-LC/PC-9LC-xx.xM
LC/MTRJ	FLT-LC/PC-MT/PC-9LC-xx.xM		FLT-LC/AP-MT/PC-9LC-xx.xM
LC/MU	FLT-LC/PC-MU/PC-9LC-xx.xM		FLT-LC/AP-MU/PC-9LC-xx.xM
LC/SC	FLT-LC/PC-SC/PC-9LC-xx.xM	FLT-LC/AP-SC/AP-9LC-xx.xM	FLT-LC/AP-SC/PC-9LC-xx.xM FLT-LC/PC-SC/AP-9LC-xx.xM
LC/ST	FLT-LC/PC-ST/PC-9LC-xx.xM		FLT-LC/AP-ST/PC-9LC-xx.xM
SC/SC	FLT-SC/PC-SC/PC-9LD-xx.xM	FLT-SC/AP-SC/AP-9LD-xx.xM	FLT-SC/AP-SC/PC-9LD-xx.xM
SC/ST	FLT-SC/PC-ST/PC-9LD-xx.xM		FLT-SC/AP-ST/PC-9LD-xx.xM
ST/ST	FLT-ST/PC-ST/PC-9LD-xx.xM		

Replace "xx.x" by length in "meters"

Fiber Optic Patch Cable assemblies

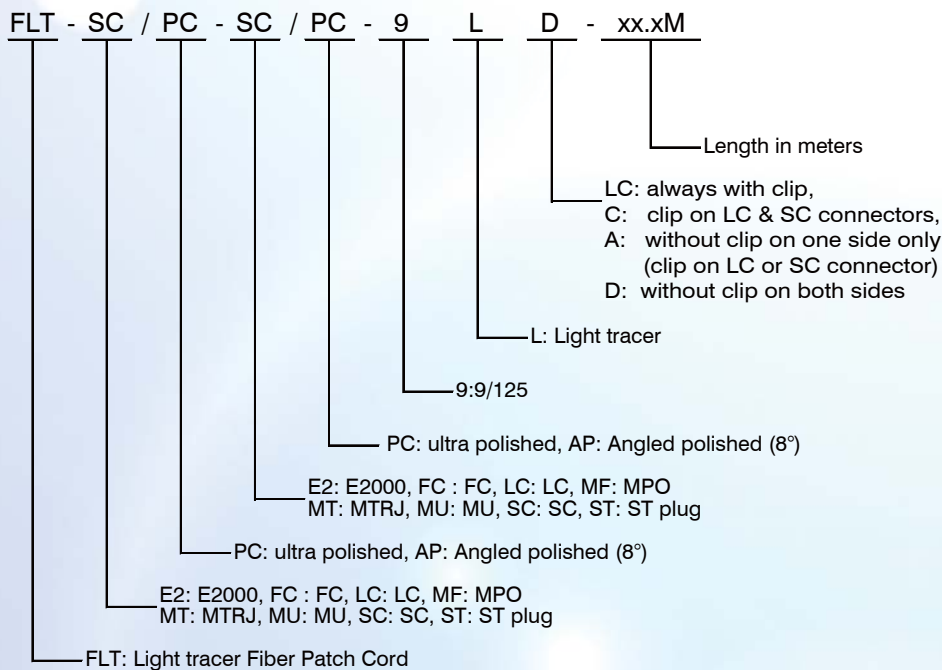
Light Tracer Patch Cords

Duplex Singlemode

OPTIONS

Cable length:	Replace "xx.x" by cable length in meter (example: 07.0 = 7 meter cable)
Cable diameter:	standard = 2.00mm (1.80mm for MTRJ)
Ultra polished OS1:	PC
Angled polished OS1-APC:	AP (only for E2000, FC, LC, SC)
Color:	Yellow

ORDERING CODE STRUCTURE

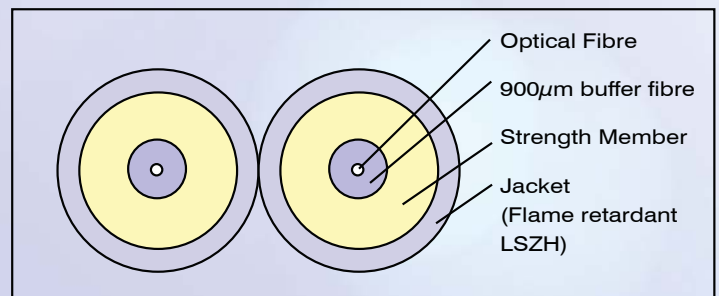
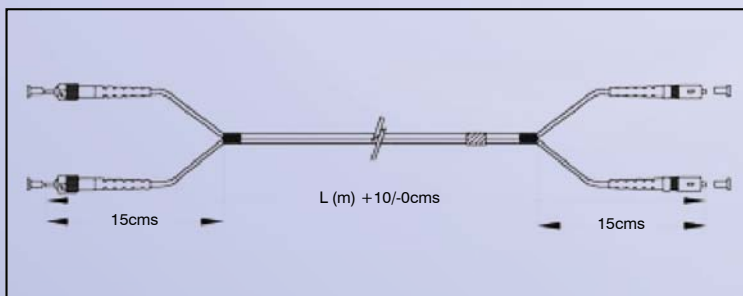


(Multimode patch cords on request)

Specifications for Standard Patch Cords



Diagram and Cross Section of Cable



General specifications

- Mating durability: min. 500 cycles
- Operating temperature: -40°C to +70°C
- LSZH cable jacket
- RoHS compliant
- Cable diameters available in 1.80mm (for MTRJ), 2mm (standard for others) and 3mm (option)
- Individual Lot numbers & Test Results delivered per cable
- Cable length tolerances:

less than 0.5 meter	= +/- 10cm
between 0.5 meter and 5 meter	= +/- 15cm
over 5 meters	= +/- 20cm

Specifications for singlemode patch cords (OS1 & OS1-APC style)

- Fiber terminations:

PC = ultra polished style
APC = (angled polished style)
- Connector styles:

PC: available in E2000, FC, LC, MTRJ, MU, SC, ST
APC: available in E2000, FC, LC, SC
- Insertion Loss: 0.3dB max. , for MTRJ: 0.5dB max.
- Return Loss: 55dB min. for PC / 60dB min. for APC
- Standard color: Yellow (others on request)

Specifications for multimode patch cords (OM1, OM2, OM3)

- Fiber types: OM1 = 62.5/125µm / OM2 = 50/125µm / OM3 = enhanced 50/125µm)
- Fiber termination: PC = ultra polished style
- Connector styles: available in E2000, FC, LC, MTRJ, MU, SC, ST
- Insertion Loss: 0.3dB max.
- Standard colors:

OM1 & OM2 = orange
OM3 = aqua blue
Other colors (on request)

MPO/MTP Cable Assemblies & Patch Panels

MPO/MTP Fiber Management

The MPO/MTP system is the perfect solution for fiber optic installations. The high density fiber optic MPO/MTP connector from “USCONEC” allows simple plug & play of the backbone fiber to the distribution cabinet. Pre-terminated MPO/MTP fiber solutions allows you to prepare the distribution cabinets in your own premises and installed at the site when the installation is ready to go live.

1. System design

The system needs to be designed according to the number of fibers and type of connectors required in the distribution cabinet. SC and MTRJ connectors can accept up to a maximum of 36 fibers, whereas LC connectors can support up to 72 fibers. For lower patch panel density requirements the standard sliding tray patch panel can be an option.

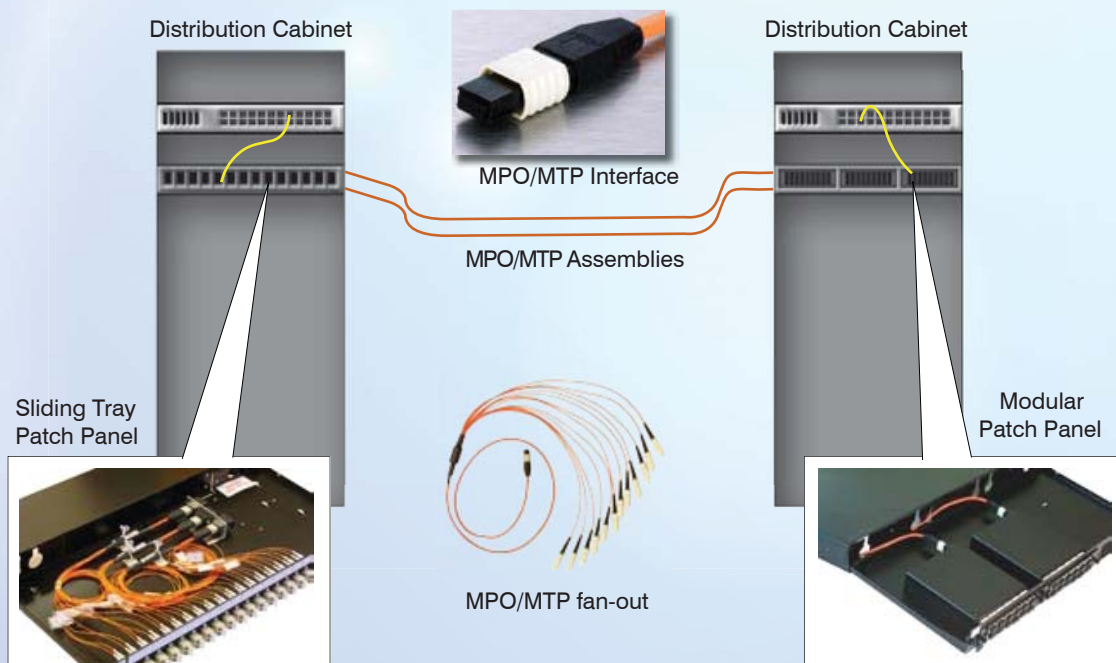
2. Site survey

Measure the total length of the backbone cable required from point A to B and increase this value by another 10% for cable slack, plus a total of 6 meters (2 meters at each end) for termination and management of the cables within the distribution cabinet.

3. Installation

The MPO/MTP cable assembly is laid into position and loosely secured to the cable tray with no bends smaller than 5cm radius. Make sure that the maximum pulling force of the cable will not be exceeded when pulling any fiber optical assembly into the building. Any excess force will damage the cable and the fibers inside. Loop any spare cable under or within the cabinet to ensure a stress free run to the rear of the patch panel. Maintain the dust caps on the MPO/MTP assemblies until final connection. Once the dust caps have been removed, connect the pre-terminated MPO/MTP fiber assembly immediately to the MPO/MTP-fan-out or module.

MPO/MTP Installation



MPO/MTP Cable Assemblies

MPO/MTP Fan-out Cables

The MPO/MTP fan-out cables for direct connections within the communications cabinet.

These cables are offered in multimode and singlemode with FC, LC, MTRJ, MU, SC and ST terminations.

Cable style	Connector	2.00mm cable	0.9mm cable
OM1 (62.5/125)	E2000	FMF-SM/PC-E2/PC-62-yy-xxxM	not available
	FC	FMF-SM/PC-FC/PC-62-yy-xxxM	FMF-SM/PC-FC/PC-69-yy-xxxM
	LC	FMF-SM/PC-LC/PC-62-yy-xxxM	FMF-SM/PC-LC/PC-69-yy-xxxM
	MTRJ	FMF-SM/PC-MT/PC-62-yy-xxxM	FMF-SM/PC-MT/PC-69-yy-xxxM
	MU	FMF-SM/PC-MU/PC-62-yy-xxxM	not available
	SC	FMF-SM/PC-SC/PC-62-yy-xxxM	FMF-SM/PC-SC/PC-69-yy-xxxM
	ST	FMF-SM/PC-ST/PC-62-yy-xxxM	FMF-SM/PC-ST/PC-69-yy-xxxM
OM2 (50/125)	E2000	FMF-SM/PC-E2/PC-52-yy-xxxM	not available
	FC	FMF-SM/PC-FC/PC-52-yy-xxxM	FMF-SM/PC-FC/PC-59-yy-xxxM
	LC	FMF-SM/PC-LC/PC-52-yy-xxxM	FMF-SM/PC-LC/PC-59-yy-xxxM
	MTRJ	FMF-SM/PC-MT/PC-52-yy-xxxM	FMF-SM/PC-MT/PC-59-yy-xxxM
	MU	FMF-SM/PC-MU/PC-52-yy-xxxM	not available
	SC	FMF-SM/PC-SC/PC-52-yy-xxxM	FMF-SM/PC-SC/PC-59-yy-xxxM
	ST	FMF-SM/PC-ST/PC-52-yy-xxxM	FMF-SM/PC-ST/PC-59-yy-xxxM
OM3(enhanced 50/125)	E2000	FMF-SM/PC-E2/PC-32-yy-xxxM	not available
	FC	FMF-SM/PC-FC/PC-32-yy-xxxM	FMF-SM/PC-FC/PC-39-yy-xxxM
	LC	FMF-SM/PC-LC/PC-32-yy-xxxM	FMF-SM/PC-LC/PC-39-yy-xxxM
	MTRJ	FMF-SM/PC-MT/PC-32-yy-xxxM	FMF-SM/PC-MT/PC-39-yy-xxxM
	MU	FMF-SM/PC-MU/PC-32-yy-xxxM	not available
	SC	FMF-SM/PC-SC/PC-32-yy-xxxM	FMF-SM/PC-SC/PC-39-yy-xxxM
	ST	FMF-SM/PC-ST/PC-32-yy-xxxM	FMF-SM/PC-ST/PC-39-yy-xxxM
OM4(50/125)	E2000	FMF-SM/PC-E2/PC-42-yy-xxxM	not available
	FC	FMF-SM/PC-FC/PC-42-yy-xxxM	FMF-SM/PC-FC/PC-49-yy-xxxM
	LC	FMF-SM/PC-LC/PC-42-yy-xxxM	FMF-SM/PC-LC/PC-49-yy-xxxM
	MTRJ	FMF-SM/PC-MT/PC-42-yy-xxxM	FMF-SM/PC-MT/PC-49-yy-xxxM
	MU	FMF-SM/PC-MU/PC-42-yy-xxxM	not available
	SC	FMF-SM/PC-SC/PC-42-yy-xxxM	FMF-SM/PC-SC/PC-49-yy-xxxM
	ST	FMF-SM/PC-ST/PC-42-yy-xxxM	FMF-SM/PC-ST/PC-49-yy-xxxM
OS1(9/125)	E2000	FMF-SM/PC-E2/PC-92-yy-xxxM	not available
	FC	FMF-SM/PC-FC/PC-92-yy-xxxM	FMF-SM/PC-FC/PC-99-yy-xxxM
	LC	FMF-SM/PC-LC/PC-92-yy-xxxM	FMF-SM/PC-LC/PC-99-yy-xxxM
	MTRJ	FMF-SM/PC-MT/PC-92-yy-xxxM	FMF-SM/PC-MT/PC-99-yy-xxxM
	MU	FMF-SM/PC-MU/PC-92-yy-xxxM	not available
	SC	FMF-SM/PC-SC/PC-92-yy-xxxM	FMF-SM/PC-SC/PC-99-yy-xxxM
	ST	FMF-SM/PC-ST/PC-92-yy-xxxM	FMF-SM/PC-ST/PC-99-yy-xxxM
OS1-APC (9/125 angled)	E2000	FMF-SM/PC-E2/AP-92-yy-xxxM	not available
	FC	FMF-SM/PC-FC/AP-92-yy-xxxM	FMF-SM/PC-FC/AP-99-yy-xxxM
	LC	FMF-SM/PC-LC/AP-92-yy-xxxM	FMF-SM/PC-LC/AP-99-yy-xxxM
	SC	FMF-SM/PC-SC/AP-92-yy-xxxM	FMF-SM/PC-SC/AP-99-yy-xxxM

Replace "yy-xxxM" by number of fibers and length in meters: Examples: -12-002M = 12 fibers / 2 Meters

MPO/MTP

MPO/MTP Cable Assemblies

MPO/MTP Fan-out Cables

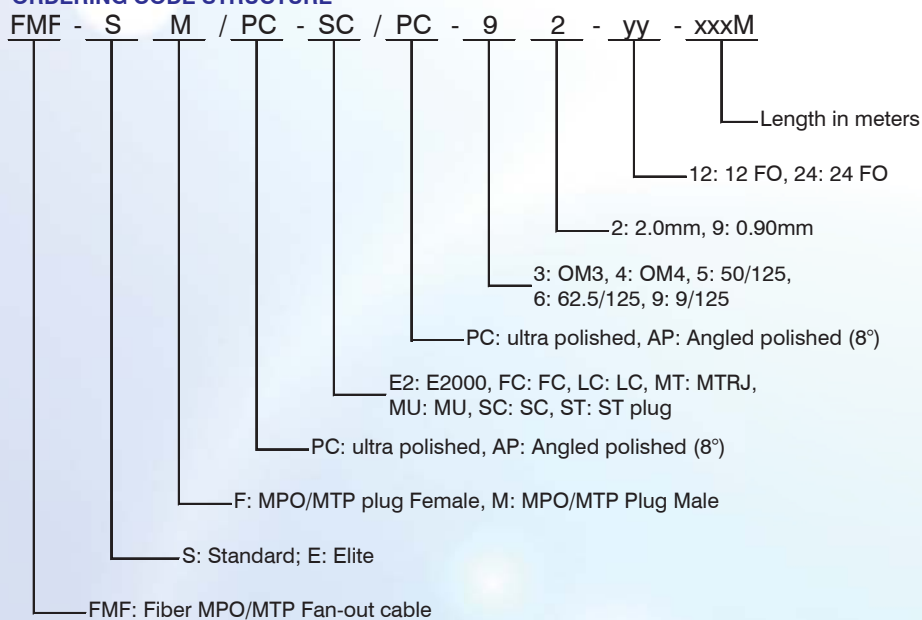


MPO/MTP 2.0mm fan-out cable



MPO/MTP 0.9mm fan-out cable

ORDERING CODE STRUCTURE



MPO/MTP Cable Assemblies

MPO/MTP Pre-terminated Trunk Cables

Pre-terminated MPO/MTP cable assemblies are offered in multimode and singlemode with female MPO/MTP terminations for installation within the building and connecting to the rear of a MPO/MTP patch panel or to a fan-out cable.

Multimode	OM1 (62.5/125)	FMP-SF/PC-SF/PC-6-yyy-A-xxxM
	OM2 (50/125)	FMP-SF/PC-SF/PC-5-yyy-A-xxxM
	OM3 (50/125)	FMP-SF/PC-SF/PC-3-yyy-A-xxxM
	OM4 (50/125)	FMP-SF/PC-SF/PC-4-yyy-A-xxxM
Singlemode	OS1 (9/125)	FMP-SF/PC-SF/PC-9-yyy-A-xxxM
	OS1-APC (9/125)	FMP-SF/AP-SF/AP-9-yyy-A-xxxM

Replace “yyy-xxxM” by number of fibers and length in meters: Examples: -012-125M = 12 fibers / 125 Meters

ORDERING CODE STRUCTURE

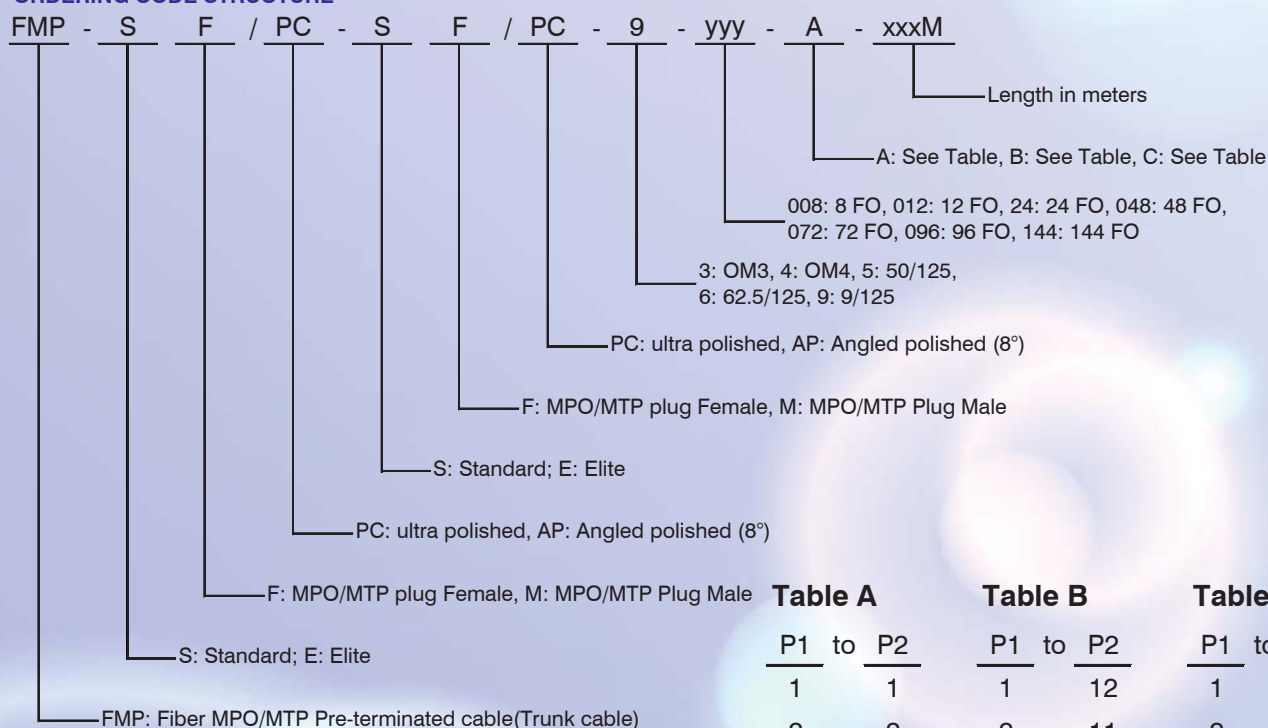


Table A

P1	to	P2
1	to	1
2	to	2
3	to	3
4	to	4
5	to	5
6	to	6
7	to	7
8	to	8
9	to	9
10	to	10
11	to	11
12	to	12

Table B

P1	to	P2
1	to	12
2	to	11
3	to	10
4	to	9
5	to	8
6	to	7
7	to	6
8	to	5
9	to	4
10	to	3
11	to	2
12	to	1

Table C

P1	to	P2
1	to	2
2	to	1
3	to	4
4	to	3
5	to	6
6	to	5
7	to	8
8	to	7
9	to	10
10	to	9
11	to	12
12	to	11

MPO/MTP

MPO/MTP Patch Panels

MPO/MTP Standard Patch Panel

19" black sliding tray patch panel pre-loaded for 24 FC, SC, ST and 48 MTRJ or LC connections to MPO/MTP cable assemblies. Contact HAPP-ETEC for more information & part numbers.

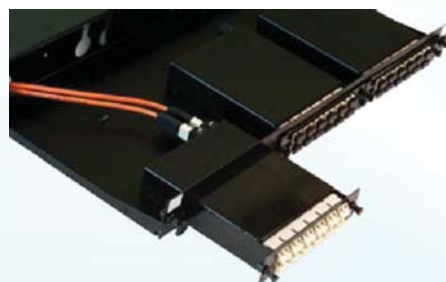
Order Code for empty Sliding Patch Panel:

FC & ST adapter style = **SPP-24-N- FC/ST-ME-B**
E2000/LC/MT/SC adapter style = **SPP-24-V- E2/LC/MT/SC-ME-B**



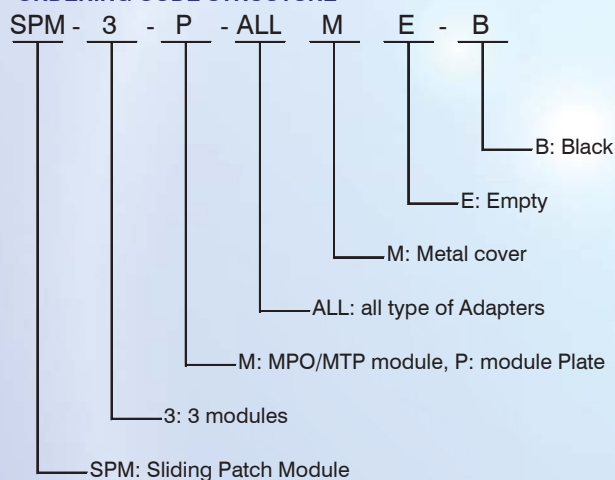
MPO/MTP Modular Sliding Patch Module

19" black sliding tray patch panel for 3 modules supports up to 36 SC connections with 3 MPO/MTP links or 72 LC/MTRJ connections with 6 MPO/MTP Links.



SPM-3-P-ALL-ME-B

ORDERING CODE STRUCTURE



MPO/MTP Patch Panels

MPO/MTP Sliding Modules

The 12 and 24 port sliding modules are designed to fit the MPO/MTP Modular Patch Panel.

Order code information

Cable style	Connector	12 Fibers	24 Fibers
OM1 (62.5/125)	E2000	MPM-PC-12-E2/PC-6	not available
	FC	MPM-PC-12-FC/PC-6	not available
	LC	MPM-PC-12-LC/PC-6	MPM-PC-24-LC/PC-6
	MTRJ	MPM-PC-12-MT/PC-6	not available
	MU	MPM-PC-12-MU/PC-6	not available
	SC	MPM-PC-12-SC/PC-6	not available
	ST	MPM-PC-12-ST/PC-6	not available
OM2 (50/125)	E2000	MPM-PC-12-E2/PC-5	not available
	FC	MPM-PC-12-FC/PC-5	not available
	LC	MPM-PC-12-LC/PC-5	MPM-PC-24-LC/PC-5
	MTRJ	MPM-PC-12-MT/PC-5	not available
	MU	MPM-PC-12-MU/PC-5	not available
	SC	MPM-PC-12-SC/PC-5	not available
	ST	MPM-PC-12-ST/PC-5	not available
OM3 (enhanced 50/125)	E2000	MPM-PC-12-E2/PC-3	not available
	FC	MPM-PC-12-FC/PC-3	not available
	LC	MPM-PC-12-LC/PC-3	MPM-PC-24-LC/PC-3
	MTRJ	MPM-PC-12-MT/PC-3	not available
	MU	MPM-PC-12-MU/PC-3	not available
	SC	MPM-PC-12-SC/PC-3	not available
	ST	MPM-PC-12-ST/PC-3	not available
OM4 (50/125)	E2000	MPM-PC-12-E2/PC-4	not available
	FC	MPM-PC-12-FC/PC-4	not available
	LC	MPM-PC-12-LC/PC-4	MPM-PC-24-LC/PC-4
	MTRJ	MPM-PC-12-MT/PC-4	not available
	MU	MPM-PC-12-MU/PC-4	not available
	SC	MPM-PC-12-SC/PC-4	not available
	ST	MPM-PC-12-ST/PC-4	not available
OS1 (9/125)	E2000	MPM-PC-12-E2/PC-9	not available
	FC	MPM-PC-12-FC/PC-9	not available
	LC	MPM-PC-12-LC/PC-9	MPM-PC-24-LC/PC-9
	MTRJ	MPM-PC-12-MT/PC-9	not available
	MU	MPM-PC-12-MU/PC-9	not available
	SC	MPM-PC-12-SC/PC-9	not available
	ST	MPM-PC-12-ST/PC-9	not available
OS1-APC (9/125 angled)	E2000	MPM-PC-12-E2/AP-9	not available
	FC	MPM-PC-12-FC/AP-9	not available
	LC	MPM-PC-12-LC/AP-9	MPM-PC-24-LC/AP-9
	SC	MPM-PC-12-SC/AP-9	not available

MPO/MTP

MPO/MTP Patch Panels

MPO/MTP Sliding Modules

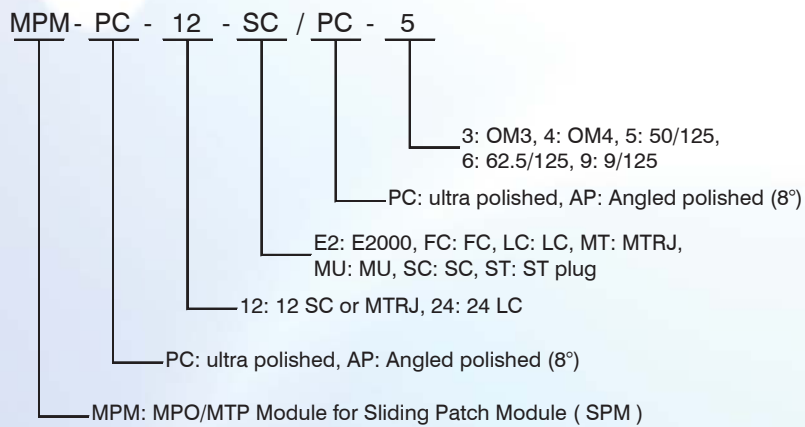


MPO/MTP 12-port SC module
pre-assembled for 12 SC connections



MPO/MTP 24-port LC module
pre-assembled for 24 LC connections

ORDERING CODE STRUCTURE

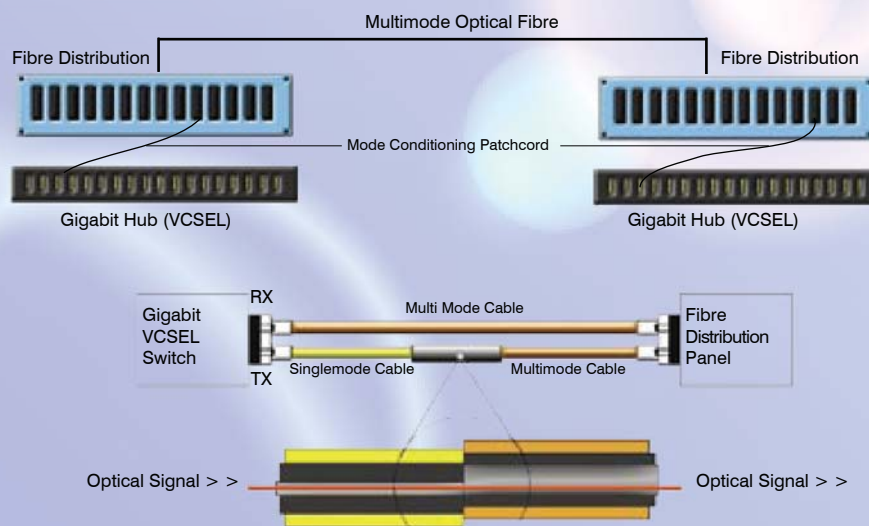


Mode Conditioning Patch Cords

Multimode optical fiber cables which are linked to a laser based transmitter can be limited in bandwidth to values less than half of the over-filled launch bandwidth. The bandwidth is very low in the case of center launch and the HAPP-ETEC mode conditioning patch cords are designed to transmit your gigabit signals into conventional precision fusion spliced to the multimode fiber to a precise core alignment. The light is launched on to the multimode fiber at a precise angle, giving the cable its mode conditioning properties. The fusion splice of the mode conditioning cable assembly is protected by a black over-wrap and the yellow side of the cable connects to the transmit side of the gigabit equipment.



Mode conditioning cables are generally used when the link distances exceed 300 meters. The HAPP-ETEC mode conditioning cable assemblies allow long wave length signals at 1310 nm to be transmitted up to 550 meter distances. The Gigabit hubs (VCSEL) are used in gigabit ethernet applications, based on a singlemode launch condition and they operate over both singlemode and multimode fiber. Differential mode delay (DMD) occurs when the transmitter device launches a singlemode laser signal into the center of the multimode fiber, resulting in transmission of multiple signals. Such signals confuse the receiver with resultant limitations on the operating bandwidth and especially the drive distances of the gigabit ethernet. The HAPP-ETEC mode conditioning cables eliminate this differential mode delay by moving the singlemode launch to an offset position away from the center of the fiber where the impurities are found.



Fiber Optic Cable assemblies

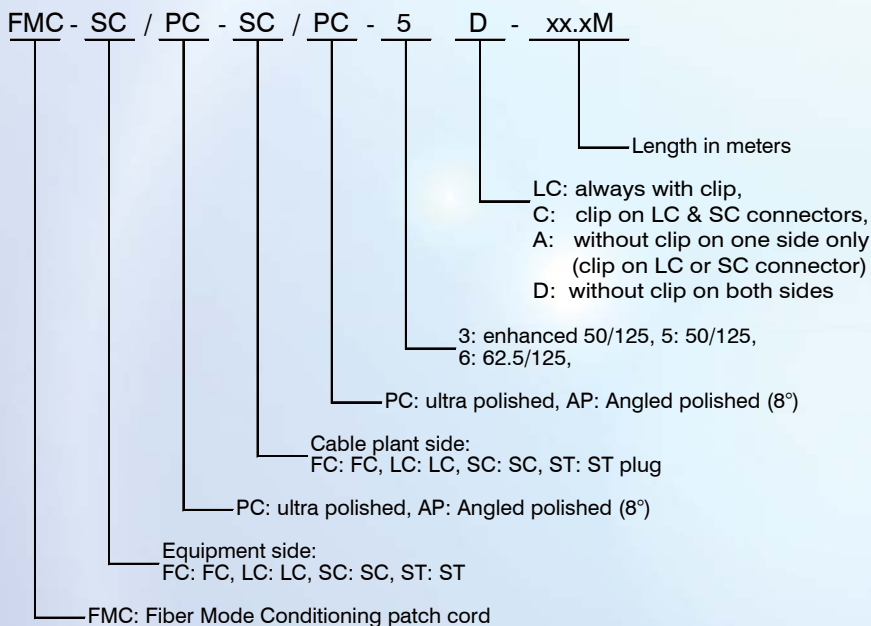
Mode Conditioning Patch Cords

Equipment side MM/SM		Cable plant side MM/MM	OM1 62.5/125μm	OM2 50/125μm	OM3 enhanced 50/125μm
FC	to	FC	FMC-FC/PC-FC/PC-6D-xxxM	FMC-FC/PC-FC/PC-5D-xxxM	FMC-FC/PC-FC/PC-3D-xxxM
FC	to	LC	FMC-FC/PC-LC/PC-6C-xxxM	FMC-FC/PC-LC/PC-5C-xxxM	FMC-FC/PC-LC/PC-3C-xxxM
FC	to	SC	FMC-FC/PC-SC/PC-6D-xxxM	FMC-FC/PC-SC/PC-5D-xxxM	FMC-FC/PC-SC/PC-3D-xxxM
FC	to	ST	FMC-FC/PC-ST/PC-6D-xxxM	FMC-FC/PC-ST/PC-5D-xxxM	FMC-FC/PC-ST/PC-3D-xxxM
LC	to	FC	FMC-LC/PC-FC/PC-6C-xxxM	FMC-LC/PC-FC/PC-5C-xxxM	FMC-LC/PC-FC/PC-3C-xxxM
LC	to	LC	FMC-LC/PC-LC/PC-6C-xxxM	FMC-LC/PC-LC/PC-5C-xxxM	FMC-LC/PC-LC/PC-3C-xxxM
LC	to	SC	FMC-LC/PC-SC/PC-6C-xxxM	FMC-LC/PC-SC/PC-5C-xxxM	FMC-LC/PC-SC/PC-3C-xxxM
LC	to	ST	FMC-LC/PC-ST/PC-6C-xxxM	FMC-LC/PC-ST/PC-5C-xxxM	FMC-LC/PC-ST/PC-3C-xxxM
SC	to	LC	FMC-SC/PC-LC/PC-6C-xxxM	FMC-SC/PC-LC/PC-5C-xxxM	FMC-SC/PC-LC/PC-3C-xxxM
SC	to	SC	FMC-SC/PC-SC/PC-6D-xxxM	FMC-SC/PC-SC/PC-5D-xxxM	FMC-SC/PC-SC/PC-3D-xxxM
SC	to	ST	FMC-SC/PC-ST/PC-6D-xxxM	FMC-SC/PC-ST/PC-5D-xxxM	FMC-SC/PC-ST/PC-3D-xxxM
ST	to	FC	FMC-ST/PC-FC/PC-6D-xxxM	FMC-ST/PC-FC/PC-5D-xxxM	FMC-ST/PC-FC/PC-3D-xxxM
ST	to	LC	FMC-ST/PC-LC/PC-6C-xxxM	FMC-ST/PC-LC/PC-5C-xxxM	FMC-ST/PC-LC/PC-3C-xxxM
ST	to	SC	FMC-ST/PC-SC/PC-6D-xxxM	FMC-ST/PC-SC/PC-5D-xxxM	FMC-ST/PC-SC/PC-3D-xxxM
ST	to	ST	FMC-ST/PC-ST/PC-6D-xxxM	FMC-ST/PC-ST/PC-5D-xxxM	FMC-ST/PC-ST/PC-3D-xxxM

OPTIONS

Cable length: Replace "xx.xM" by cable length in meter
Examples: 25.0M = 25 Meters

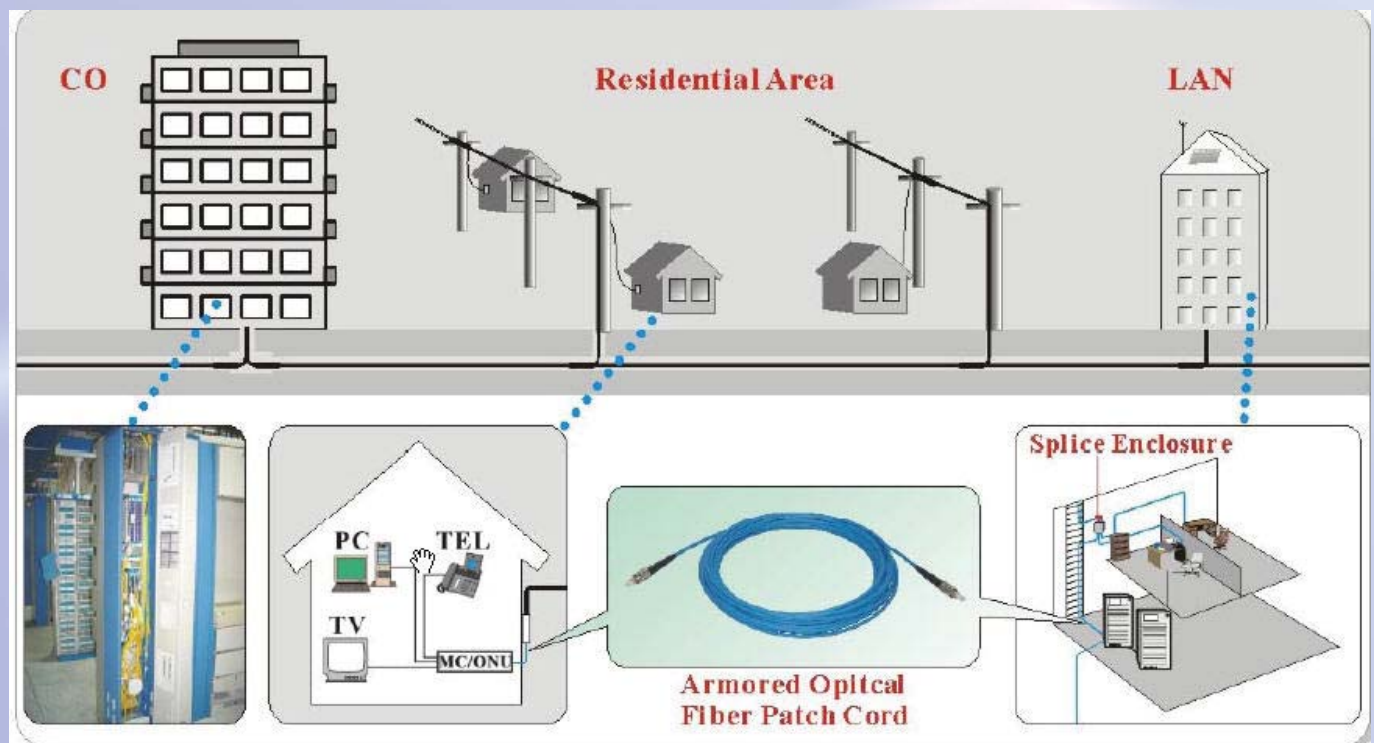
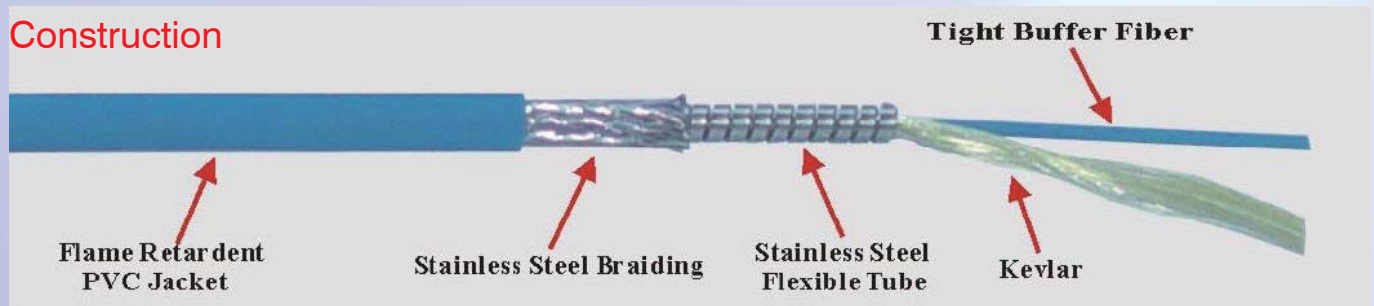
ORDERING CODE STRUCTURE



Armored Patch Cords

The armored cables are used in harsh environments and they enhance the stability and safety of the whole network. They are also very popular for covering long distances, since the fibers are protected by a stainless steel flexible tube, which substantially increases the tensile strength, pressure and twist resistance. As a result it greatly increases the yield during the installation phase and thus offers a high cost saving. These cables sustain up to 300 kilo weight which also avoids damage from trampling on the cables. The construction of the armored cable offers high flexibility despite the armored braiding and tubing surrounding the fiber optic cable. It also secures transmission power and avoids extra attenuation compared to standard patch cords, in case of bending/twisting the cables and/or when using cable ties to attach several cables together.

Construction



Fiber Optic Cable assemblies

Specifications for Armored Patch Cords

General specifications

- Mating durability: min. 500 cycles
- Operating temperature: -40°C to +85°C
- RoHS compliant
- Pulling force: 20 kilos (pulling velocity 50mm/min)
- Load force: 300 kilos (Tube deformation >50°, FO still functioning)
- Cable diameter: 3mm
- Individual Lot numbers & Test Results delivered per cable
- Cable length tolerances:

less than 0.5 meter	=	+/- 10cm
between 0.5 meter and 5 meter	=	+/- 15cm
over 5 meters	=	+/- 20cm

Specifications for singlemode patch cords (OS1 & OS1-APC style)

- Fiber terminations:

PC = ultra polished style
APC = (8° angled polished style)
- Connector styles:

PC: available in E2000, FC, LC, MTRJ, MU, SC, ST
APC: available in E2000, FC, SC
- Insertion Loss: <0.5dB for MTRJ / <0.3dB (all others)
- Return Loss: >55dB for PC / >60dB for APC
- Standard color: Yellow (others on request)

Specifications for multimode patch cords (OM1, OM2, OM3)

- Fiber types: OM1 = 62.5/125μm / OM2 = 50/125μm / OM3 = enhanced 50/125μm
- Fiber termination: PC = ultra polished style
- Connector styles: available in E2000, FC, LC, MTRJ, MU, SC, ST
- Insertion Loss: <0.3dB / typ. 0.2dB
- Standard colors:

OM1 = Grey
OM2 = Orange
OM3 = Blue
Other colors (on request)

Armored Patch Cords

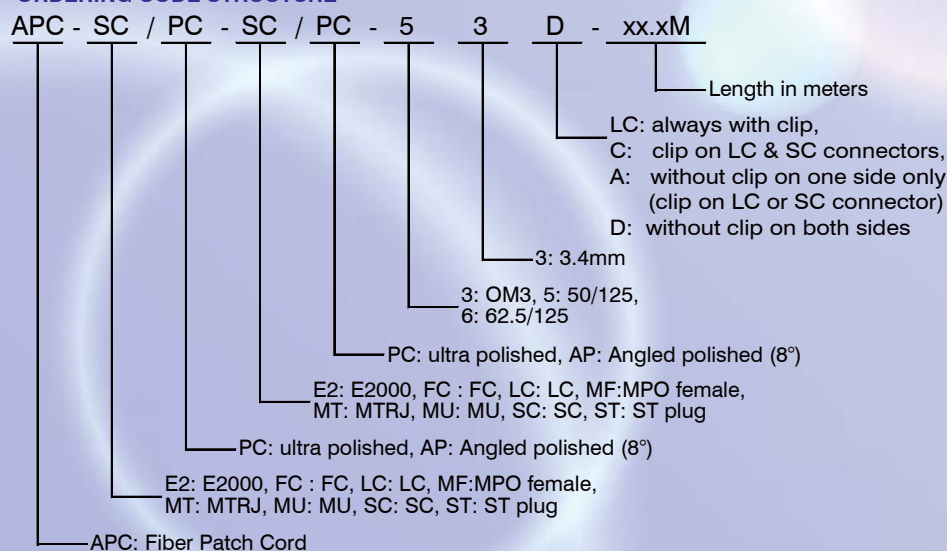
Duplex Multimode

	OM1 62.5/125μm grey color	OM2 50/125μm orange color	OM3 enhanced 50/125μm blue color
E2000/E2000	APC-E2/PC-E2/PC-63D-xx.xM	APC-E2/PC-E2/PC-53D-xx.xM	APC-E2/PC-E2/PC-33D-xx.xM
E2000/FC	APC-E2/PC-FC/PC-63D-xx.xM	APC-E2/PC-FC/PC-53D-xx.xM	APC-E2/PC-FC/PC-33D-xx.xM
E2000/LC	APC-E2/PC-LC/PC-63C-xx.xM	APC-E2/PC-LC/PC-53C-xx.xM	APC-E2/PC-LC/PC-33C-xx.xM
E2000/MTRJ	APC-E2/PC-MT/PC-63D-xx.xM	APC-E2/PC-MT/PC-53D-xx.xM	APC-E2/PC-MT/PC-33D-xx.xM
E2000/SC	APC-E2/PC-SC/PC-63D-xx.xM	APC-E2/PC-SC/PC-53D-xx.xM	APC-E2/PC-SC/PC-33D-xx.xM
E2000/ST	APC-E2/PC-ST/PC-63D-xx.xM	APC-E2/PC-ST/PC-53D-xx.xM	APC-E2/PC-ST/PC-33D-xx.xM
FC/FC	APC-FC/PC-FC/PC-63D-xx.xM	APC-FC/PC-FC/PC-53D-xx.xM	APC-FC/PC-FC/PC-33D-xx.xM
FC/LC	APC-FC/PC-LC/PC-63C-xx.xM	APC-FC/PC-LC/PC-53C-xx.xM	APC-FC/PC-LC/PC-33C-xx.xM
FC/MTRJ	APC-FC/PC-MT/PC-63D-xx.xM	APC-FC/PC-MT/PC-53D-xx.xM	APC-FC/PC-MT/PC-33D-xx.xM
FC/MU	APC-FC/PC-MU/PC-63D-xx.xM	APC-FC/PC-MU/PC-53D-xx.xM	APC-FC/PC-MU/PC-33D-xx.xM
FC/SC	APC-FC/PC-SC/PC-63D-xx.xM	APC-FC/PC-SC/PC-53D-xx.xM	APC-FC/PC-SC/PC-33D-xx.xM
FC/ST	APC-FC/PC-ST/PC-63D-xx.xM	APC-FC/PC-ST/PC-53D-xx.xM	APC-FC/PC-ST/PC-33D-xx.xM
LC/LC	APC-LC/PC-LC/PC-63C-xx.xM	APC-LC/PC-LC/PC-53C-xx.xM	APC-LC/PC-LC/PC-33C-xx.xM
LC/MPO	APC-LC/PC-MF/PC-63C-xx.xM	APC-LC/PC-MF/PC-53C-xx.xM	APC-LC/PC-MF/PC-33C-xx.xM
LC/MTRJ	APC-LC/PC-MT/PC-63C-xx.xM	APC-LC/PC-MT/PC-53C-xx.xM	APC-LC/PC-MT/PC-33C-xx.xM
LC/MU	APC-LC/PC-MU/PC-63C-xx.xM	APC-LC/PC-MU/PC-53C-xx.xM	APC-LC/PC-MU/PC-33C-xx.xM
LC/SC	APC-LC/PC-SC/PC-63C-xx.xM	APC-LC/PC-SC/PC-53C-xx.xM	APC-LC/PC-SC/PC-33C-xx.xM
LC/ST	APC-LC/PC-ST/PC-63C-xx.xM	APC-LC/PC-ST/PC-53C-xx.xM	APC-LC/PC-ST/PC-33C-xx.xM
MTRJ/MTRJ	APC-MT/PC-MT/PC-63D-xx.xM	APC-MT/PC-MT/PC-53D-xx.xM	APC-MT/PC-MT/PC-33D-xx.xM
MTRJ/SC	APC-MT/PC-SC/PC-63D-xx.xM	APC-MT/PC-SC/PC-53D-xx.xM	APC-MT/PC-SC/PC-33D-xx.xM
MTRJ/ST	APC-MT/PC-ST/PC-63D-xx.xM	APC-MT/PC-ST/PC-53D-xx.xM	APC-MT/PC-ST/PC-33D-xx.xM
MPO/SC	APC-MF/PC-SC/PC-63D-xx.xM	APC-MF/PC-SC/PC-53D-xx.xM	APC-MF/PC-SC/PC-33D-xx.xM
MPO/ST	APC-MF/PC-ST/PC-63D-xx.xM	APC-MF/PC-ST/PC-53D-xx.xM	APC-MF/PC-ST/PC-33D-xx.xM
SC/SC	APC-SC/PC-SC/PC-63D-xx.xM	APC-SC/PC-SC/PC-53D-xx.xM	APC-SC/PC-SC/PC-33D-xx.xM
SC/ST	APC-SC/PC-ST/PC-63D-xx.xM	APC-SC/PC-ST/PC-53D-xx.xM	APC-SC/PC-ST/PC-33D-xx.xM
ST/ST	APC-ST/PC-ST/PC-63D-xx.xM	APC-ST/PC-ST/PC-53D-xx.xM	APC-ST/PC-ST/PC-33D-xx.xM

OPTIONS

Cable length:	Replace "xx.x" by cable length in meter (example: 35.0 = 35 meter cable)		
Cable diameter:	3.4mm		
Color:	OM1	=	Grey (other colors on request)
	OM2	=	Orange (other colors on request)
	OM3	=	Blue (other colors on request)

ORDERING CODE STRUCTURE



Fiber Optic Cable assemblies

Armored Patch Cords

Duplex Singlemode

	OS1 9/125μm (PC/PC) Yellow color	OS1-APC 9/125μm (APC/APC) Yellow color	Mixed: OS1-APC & OS1 9/125μm (APC/APC) Yellow color
E2000/E2000	APC-E2/PC-E2/PC-93D-xx.xM	APC-E2/AP-E2/AP-93D-xx.xM	APC-E2/AP-E2/PC-93D-xx.xM
E2000/FC	APC-E2/PC-FC/PC-93D-xx.xM	APC-E2/AP-FC/AP-93D-xx.xM	APC-E2/AP-FC/PC-93D-xx.xM APC-E2/PC-FC/AP-93D-xx.xM
E2000/LC	APC-E2/PC-LC/PC-93C-xx.xM		APC-E2/AP-LC/PC-93C-xx.xM
E2000/MTRJ	APC-E2/PC-MT/PC-93D-xx.xM		APC-E2/AP-MT/PC-93D-xx.xM
E2000/SC	APC-E2/PC-SC/PC-93D-xx.xM	APC-E2/AP-SC/AP-93D-xx.xM	APC-E2/AP-SC/PC-93D-xx.xM APC-E2/PC-SC/AP-93D-xx.xM
E2000/ST	APC-E2/PC-ST/PC-93D-xx.xM		APC-E2/AP-ST/PC-93D-xx.xM
FC/FC	APC-FC/PC-FC/PC-93D-xx.xM	APC-FC/AP-FC/AP-93D-xx.xM	APC-FC/AP-FC/PC-93D-xx.xM
FC/LC	APC-FC/PC-LC/PC-93C-xx.xM	APC-FC/AP-LC/AP-93C-xx.xM	APC-FC/AP-LC/PC-93C-xx.xM
FC/MPO	APC-FC/PC-MF/PC-93D-xx.xM	APC-FC/AP-MF/AP-93D-xx.xM	APC-FC/AP-MF/PC-93D-xx.xM APC-FC/PC-MF/AP-93D-xx.xM
FC/MTRJ	APC-FC/PC-MT/PC-93D-xx.xM		APC-FC/AP-MT/PC-93D-xx.xM
FC/MU	APC-FC/PC-MU/PC-93D-xx.xM		APC-FC/AP-MU/PC-93D-xx.xM
FC/SC	APC-FC/PC-SC/PC-93D-xx.xM	APC-FC/AP-SC/AP-93D-xx.xM	APC-FC/AP-SC/PC-93D-xx.xM APC-FC/PC-SC/AP-93D-xx.xM
LC/LC	APC-LC/PC-LC/PC-93C-xx.xM		
LC/MPO	APC-LC/PC-MF/PC-93C-xx.xM		APC-LC/PC-MF/AP-93C-xx.xM
LC/MTRJ	APC-LC/PC-MT/PC-93C-xx.xM		
LC/MU	APC-LC/PC-MU/PC-93C-xx.xM		
LC/SC	APC-LC/PC-SC/PC-93C-xx.xM		APC-LC/PC-SC/AP-93C-xx.xM
LC/ST	APC-LC/PC-ST/PC-93C-xx.xM		
MPO/SC	APC-MF/PC-SC/PC-93D-xx.xM	APC-MF/AP-SC/AP-93D-xx.xM	APC-MF/AP-SC/PC-93D-xx.xM APC-MF/PC-SC/AP-93D-xx.xM
MPO/ST	APC-MF/PC-ST/PC-93D-xx.xM		APC-MF/AP-ST/PC-93D-xx.xM
MTRJ/MTRJ	APC-MT/PC-MT/PC-93D-xx.xM		
MTRJ/SC	APC-MT/PC-SC/PC-93D-xx.xM		APC-MT/PC-SC/AP-93D-xx.xM
MTRJ/ST	APC-MT/PC-ST/PC-93D-xx.xM		
SC/SC	APC-SC/PC-SC/PC-93D-xx.xM	APC-SC/AP-SC/AP-93D-xx.xM	APC-SC/AP-SC/PC-93D-xx.xM
SC/ST	APC-SC/PC-ST/PC-93D-xx.xM		APC-SC/AP-ST/PC-93D-xx.xM
ST/ST	APC-ST/PC-ST/PC-93D-xx.xM		

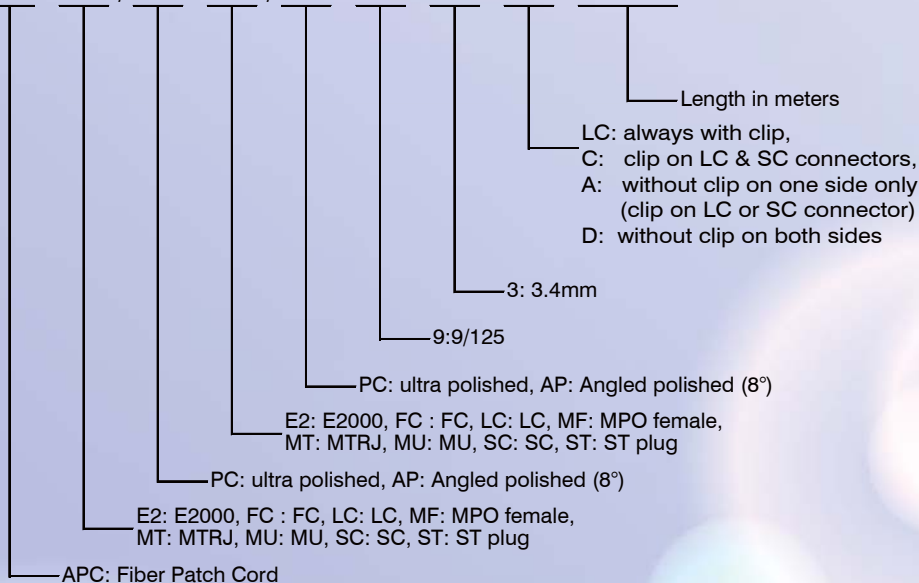
Armored Patch Cords Duplex Singlemode

OPTIONS

Cable length:	Replace "xx.x" by cable length in meter (example:35.0 = 35 meter cable)
Cable diameter:	3.4mm
Ultra polished OS1:	PC
Angled polished OS1-APC:	AP (only for E2000, FC, MPO, SC)
Color:	Yellow (standard) Others (on request)

ORDERING CODE STRUCTURE

APC - SC / PC - SC / PC - 9 3 D - xx.xM

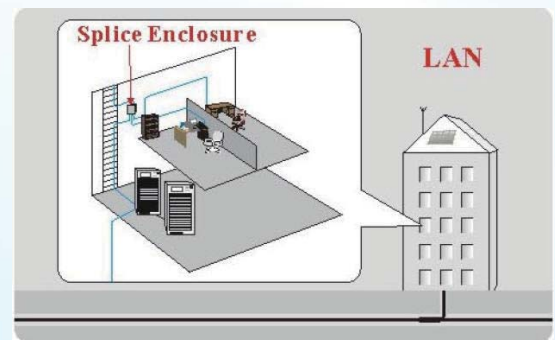
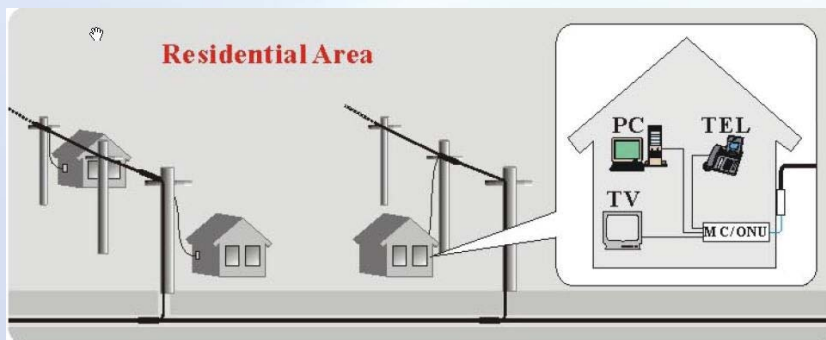
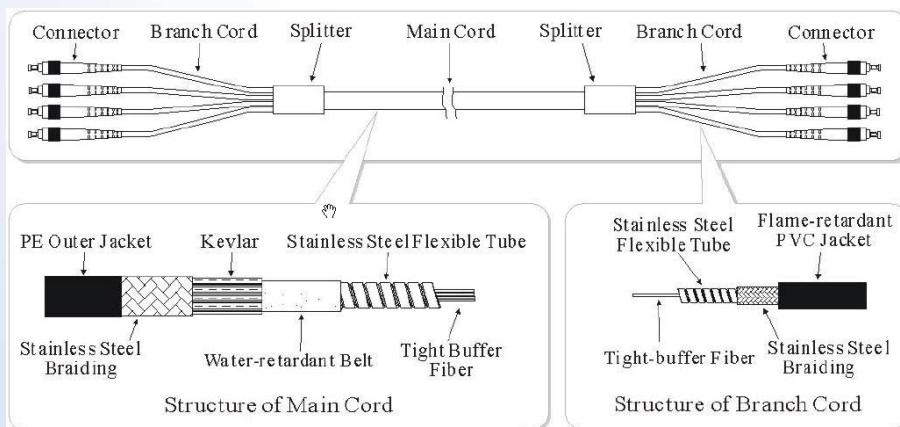


Fiber Optic Cable assemblies

Armored Dispatching Cords

The armored dispatching cords are generally used in harsh environments and they enhance the stability and safety of the whole network. The fibers are protected by a stainless steel flexible tube, which substantially increases the tensile strength, pressure and twist resistance. As a result it greatly increases the yield during the installation phase and thus offers a high cost saving. The PVC coating of the different branch cords can be offered up to 12 different standard colors (IEC6030) and with a maximum core count of 12. The outer jacket and water retardant belt prevent the fiber from damage due to water and/or humidity.

These cables are mainly used for connecting between floors and multi-core connections to the ODF (Optical Fiber Distribution Frame) and is most suitable for the transmission of the last 100 meters of FTTH (Fiber to the Home).



General Specifications

Insertion loss:	SM = 0.2dB max. / MM = 0.3dB max.
Return loss (SM):	45dB min (PC) / 50dB min (UPC) / 60dB min (APC)
Pressure resistance:	≤300 kilos
Tensile resistance:	Main cord: 100 kilos / branch cord: 15 kilos
Operating temperature:	-40°C to +85°C
Cable diameter:	Main cord: 6.0/6.9mm +/- 0.1mm Branch cord: 2.5/3.00mm +/- 0.1mm

Armored Dispatching Cords Multimode

	OM1 62.5/125μm	OM2 50/125μm	OM3 enhanced 50/125μm
E2000/E2000	ADC-E2/PC-E2/PC-6yy-xxxM	ADC-E2/PC-E2/PC-5yy-xxxM	ADC-E2/PC-E2/PC-3yy-xxxM
E2000/FC	ADC-E2/PC-FC/PC-6yy-xxxM	ADC-E2/PC-FC/PC-5yy-xxxM	ADC-E2/PC-FC/PC-3yy-xxxM
E2000/LC	ADC-E2/PC-LC/PC-6yy-xxxM	ADC-E2/PC-LC/PC-5yy-xxxM	ADC-E2/PC-LC/PC-3yy-xxxM
E2000/MTRJ	ADC-E2/PC-MT/PC-6yy-xxxM	ADC-E2/PC-MT/PC-5yy-xxxM	ADC-E2/PC-MT/PC-3yy-xxxM
E2000/SC	ADC-E2/PC-SC/PC-6yy-xxxM	ADC-E2/PC-SC/PC-5yy-xxxM	ADC-E2/PC-SC/PC-3yy-xxxM
E2000/ST	ADC-E2/PC-ST/PC-6yy-xxxM	ADC-E2/PC-ST/PC-5yy-xxxM	ADC-E2/PC-ST/PC-3yy-xxxM
FC/FC	ADC-FC/PC-FC/PC-6yy-xxxM	ADC-FC/PC-FC/PC-5yy-xxxM	ADC-FC/PC-FC/PC-3yy-xxxM
FC/LC	ADC-FC/PC-LC/PC-6yy-xxxM	ADC-FC/PC-LC/PC-5yy-xxxM	ADC-FC/PC-LC/PC-3yy-xxxM
FC/MTRJ	ADC-FC/PC-MT/PC-6yy-xxxM	ADC-FC/PC-MT/PC-5yy-xxxM	ADC-FC/PC-MT/PC-3yy-xxxM
FC/MU	ADC-FC/PC-MU/PC-6yy-xxxM	ADC-FC/PC-MU/PC-5yy-xxxM	ADC-FC/PC-MU/PC-3yy-xxxM
FC/SC	ADC-FC/PC-SC/PC-6yy-xxxM	ADC-FC/PC-SC/PC-5yy-xxxM	ADC-FC/PC-SC/PC-3yy-xxxM
LC/LC	ADC-LC/PC-LC/PC-6yy-xxxM	ADC-LC/PC-LC/PC-5yy-xxxM	ADC-LC/PC-LC/PC-3yy-xxxM
LC/MTRJ	ADC-LC/PC-MT/PC-6yy-xxxM	ADC-LC/PC-MT/PC-5yy-xxxM	ADC-LC/PC-MT/PC-3yy-xxxM
LC/MU	ADC-LC/PC-MU/PC-6yy-xxxM	ADC-LC/PC-MU/PC-5yy-xxxM	ADC-LC/PC-MU/PC-3yy-xxxM
LC/SC	ADC-LC/PC-SC/PC-6yy-xxxM	ADC-LC/PC-SC/PC-5yy-xxxM	ADC-LC/PC-SC/PC-3yy-xxxM
LC/ST	ADC-LC/PC-ST/PC-6yy-xxxM	ADC-LC/PC-ST/PC-5yy-xxxM	ADC-LC/PC-ST/PC-3yy-xxxM
MTRJ/MTRJ	ADC-MT/PC-MT/PC-6yy-xxxM	ADC-MT/PC-MT/PC-5yy-xxxM	ADC-MT/PC-MT/PC-3yy-xxxM
MTRJ/SC	ADC-MT/PC-SC/PC-6yy-xxxM	ADC-MT/PC-SC/PC-5yy-xxxM	ADC-MT/PC-SC/PC-3yy-xxxM
MTRJ/ST	ADC-MT/PC-ST/PC-6yy-xxxM	ADC-MT/PC-ST/PC-5yy-xxxM	ADC-MT/PC-ST/PC-3yy-xxxM
SC/SC	ADC-SC/PC-SC/PC-6yy-xxxM	ADC-SC/PC-SC/PC-5yy-xxxM	ADC-SC/PC-SC/PC-3yy-xxxM
SC/ST	ADC-SC/PC-ST/PC-6yy-xxxM	ADC-SC/PC-ST/PC-5yy-xxxM	ADC-SC/PC-ST/PC-3yy-xxxM
ST/ST	ADC-ST/PC-ST/PC-6yy-xxxM	ADC-ST/PC-ST/PC-5yy-xxxM	ADC-ST/PC-ST/PC-3yy-xxxM

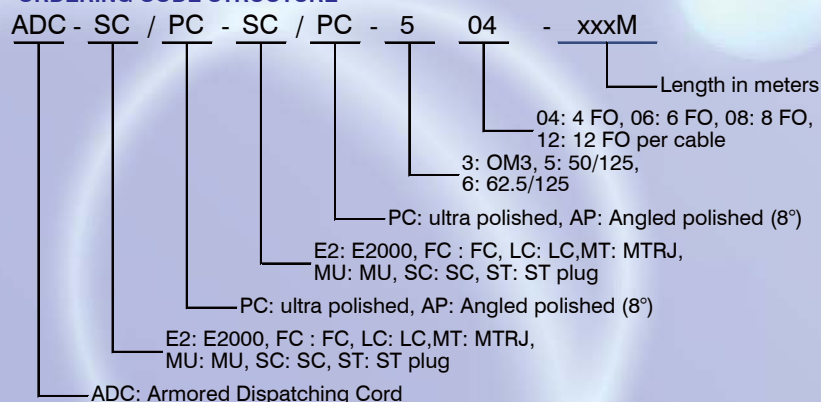
OPTIONS

Cable length: Replace "yy-xxxM" , "yy" by number of fibers (04, 06, 08, 12) and "xxx" by length in meters (total cable length, including breakout cables)
 Examples: 12-020M = 12 fibers / 20 Meters
 04-100M = 4 fibers / 100 Meters

Breakout cable length (Branch cords): 1 meters (standard) – others on request

Colors: Main cable: black
 Break-out cables: Individual colors for easy identification

ORDERING CODE STRUCTURE



Fiber Optic Cable assemblies

Armored Dispatching Cords Singlemode

	OS1 9/125μm (PC/PC)	OS1-APC 9/125μm (APC/APC)	Mixed: OS1-APC & OS1 9/125μm (APC/APC)
E2000/E2000	ADC-E2/PC-E2/PC-9yy-xxxM	ADC-E2/AP-E2/AP-9yy-xxxM	ADC-E2/AP-E2/PC-9yy-xxxM
E2000/FC	ADC-E2/PC-FC/PC-9yy-xxxM	ADC-E2/AP-FC/AP-9yy-xxxM	ADC-E2/AP-FC/PC-9yy-xxxM
E2000/LC	ADC-E2/PC-LC/PC-9yy-xxxM		ADC-E2/AP-LC/PC-9yy-xxxM
E2000/SC	ADC-E2/PC-SC/PC-9yy-xxxM	ADC-E2/AP-SC/AP-9yy-xxxM	ADC-E2/AP-SC/PC-9yy-xxxM
E2000/ST	ADC-E2/PC-ST/PC-9yy-xxxM		ADC-E2/AP-ST/PC-9yy-xxxM
FC/FC	ADC-FC/PC-FC/PC-9yy-xxxM	ADC-FC/AP-FC/AP-9yy-xxxM	ADC-FC/AP-FC/PC-9yy-xxxM
FC/LC	ADC-FC/PC-LC/PC-9yy-xxxM		ADC-FC/AP-LC/PC-9yy-xxxM
FC/MU	ADC-FC/PC-MU/PC-9yy-xxxM		ADC-FC/AP-MU/PC-9yy-xxxM
FC/SC	ADC-FC/PC-SC/PC-9yy-xxxM	ADC-FC/AP-SC/AP-9yy-xxxM	ADC-FC/AP-SC/PC-9yy-xxxM
LC/LC	ADC-LC/PC-LC/PC-9yy-xxxM		
LC/MU	ADC-LC/PC-MU/PC-9yy-xxxM		
LC/SC	ADC-LC/PC-SC/PC-9yy-xxxM		ADC-LC/PC-SC/AP-9yy-xxxM
LC/ST	ADC-LC/PC-ST/PC-9yy-xxxM		
SC/SC	ADC-SC/PC-SC/PC-9yy-xxxM	ADC-SC/AP-SC/AP-9yy-xxxM	ADC-SC/AP-SC/PC-9yy-xxxM
SC/ST	ADC-SC/PC-ST/PC-9yy-xxxM		
ST/ST	ADC-ST/PC-ST/PC-9yy-xxxM		

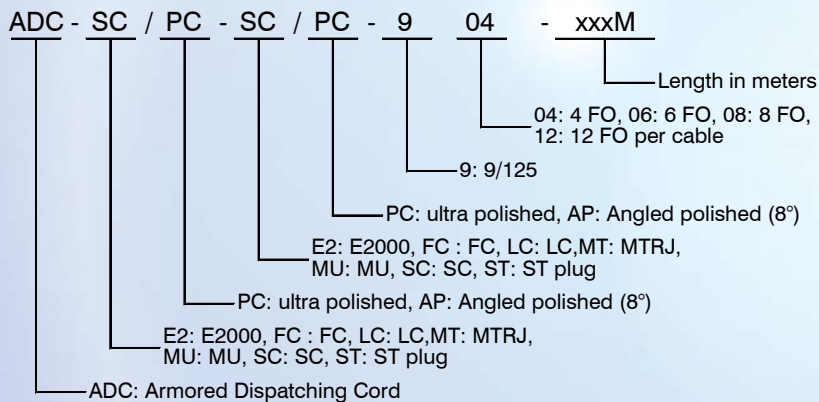
OPTIONS

Cable length: Replace "yy-xxxM", "yy" by number of fibers (04, 06, 08, 12) and "xxx" by length in meters (total cable length, including breakout cables)
 Examples: 12-020M = 12 fibers / 20 Meters
 04-100M = 4 fibers / 100 Meters

Breakout cable length (Branch cords): 1 meters (standard) – others on request

Colors: Main cable: black
 Break-out cables: Individual colors for easy identification

ORDERING CODE STRUCTURE



Gigabit Transceivers

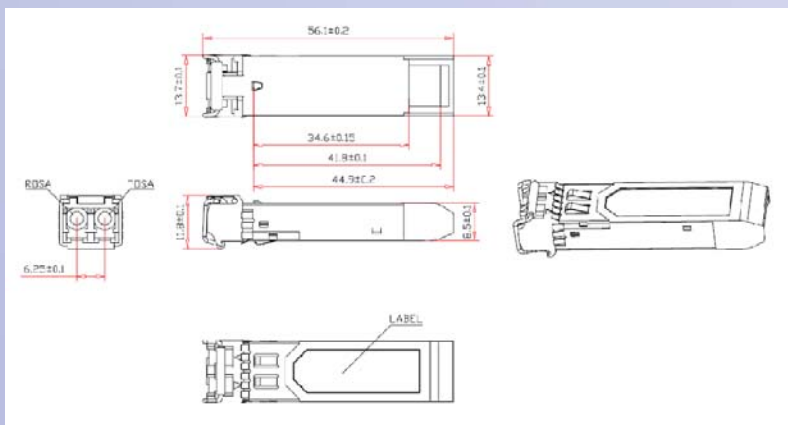
HAPP-ETEC offers a comprehensive range of Gigabit interface converters (GBIC) for transceivers, commonly used with Gigabit Ethernet for copper and fiber channel. The GBIC is a hot swappable electrical interface and the long-wavelength SFP transceivers are compatible with the Small Form Factor Multi-Sourcing Agreement (MSA) and comply with the IEEE standards for Gigabit Ethernet applications.



The following Gigabit long-wave SFP Transceiver are available as standard products from HAPP-ETEC and any other types are available on request:

Ordering Code	Transceiver description
GBIC-GLC-T -SFP	1000Base T (RJ45/100m/ Cat5e) transceiver for CISCO
GBIC-GLC-SX-MM-SFP	1000Base SX (LC/550m/850nm/Multimode) transceiver for CISCO
GBIC-GLC-LH-SM-SFP	1000Base LX (LC/10km/1310nm/singlemode) transceiver for CISCO
GBIC-GLC-ZX-SM-SFP	1000Base ZX (LC/70km/1550nm/singlemode) transceiver for CISCO

General SFP dimensions



Product features

- Up to 1.25Gb/s bi-directional data links (all others on request)
- Hot pluggable SFP footprint
- 850nm, 1310 & 1550 nm Fabry-Perot laser transmitter
- Duplex LC connector
- Very low jitter
- No Rate Select input required for Fiber Channel 1x/2x Operation
- Up to 70 km on 9/125μm SM fiber (depending on GBIC type)
- Metal enclosure for lower EMI
- Single 3.3V power supply
- Low power dissipation <700mW typical
- CWDM is also available

Applications

- Gigabit Ethernet
- 1x Fiber or 1x copper channel
- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other optical transmission systems

Gigabit Transceivers

Technical Specifications

1. Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Note
Maximum Supply Voltage	Vcc	0.5		4.5	V	
Storage Temperature	TS	-40		100	°C	
Case Operating Temperature	TOP	-40		85	°C	
Relative Humidity	RH	0		85	%	1

2. Electrical Characteristics (TOP = -40°C to +85°C, VCC 3V to 3.60V)

Parameter	Symbol	Min	Typ	Max	Unit	Note
Supply Voltage	Vcc	3		3.6	V	
Supply Current	Icc		200	300	mA	
Transmitter						
Input differential impedance	Rin		100		Ω	2
Single ended data input swing	Vin,pp	250		1200	mV	
Transmit Disable Voltage	VD	Vcc – 1.3		Vcc	V	
Transmit Enable Voltage	VEN	Vee		Vee+ 0.8	V	3
Transmit Disable Assert Time				10	us	
Receiver						
Single ended data output swing	Vout,pp	300	400	800	mV	4
Data output rise time	tr		100	175	ps	5
Data output fall time	tf		100	175	ps	5
LOS Fault	VLOS fault	Vcc – 0.5		VccHOST	V	6
LOS Normal	VLOS	norm Vee		Vee+0.5	V	6
Power Supply Rejection	PSR	100			mVpp	7
Deterministic Jitter Contribution	RX Δ DJ			51.7	ps	8
Total Jitter Contribution	RX Δ TJ			122.4	ps	

Notes:

1. Non condensing.
2. AC coupled.
3. Or open circuit.
4. Into 100 ohm differential termination.
5. 20 – 80 %
6. LOS is LVTTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
7. All transceiver specifications are compliant with a power supply sinusoidal modulation of 20 Hz to 1.5 MHz up to specified value applied through the power supply filtering network shown on page 23 of the Small Form-factor Pluggable (SFP) Transceiver MultiSource Agreement (MSA), September 14, 2000.
8. Measured with DJ-free data input signal. In actual application, output DJ will be the sum of input DJ and DJ and Δ DJ.

Gigabit Transceivers

3. Optical Characteristics (TOP = 0°C to +70°C, VCC 3V to 3.60V)

Parameter	Symbol	Min	Typ	Max	Unit	Note
Transmitter						
Output Opt. Power	POUT	-8		0	dBm	1
Optical Wavelength	λ	1270	1310	1360	nm	2
Spectral Width	σ			3	nm	2
Optical Modulation Amplitude	OMA	174			μ W	2,3
Optical Rise/Fall Time	tr/ tf		100	160	ps	4
RIN				-120	dB/Hz	
Deterministic Jitter Contribution	TX Δ DJ		20	56.5	ps	5
Total Jitter Contribution	TX Δ TJ		70	119	ps	
Optical Extinction Ratio	ER	9			dB	
Receiver						
Average Rx Sensitivity @ 2.125 Gb/s (2X Fiber Channel)	RSENS1			-21	dBm	6, 7
Average Rx Sensitivity @ 1.25 Gb/s (Gigabit Ethernet)	RSENS2			-22	dBm	6, 7
Average Rx Sensitivity @ 1.06 Gb/s (1X Fiber Channel)	RSENS1			-22	dBm	6, 7
Stressed RX sens. = 1.25 Gb/s			-18	-14.5	dBm	
Average Received Power	RxMAX			0	dBm	
Receiver Elec. 3 dB cutoff freq.				1500	MHz	
Optical Center Wavelength	λ C	1265		1600	nm	
Return Loss		12			dB	
LOS De-Assert	LOSD		-23	-19	dBm	
LOS Assert	LOSA	-30	-25		dBm	
LOS Hysteresis		0.5			dB	

Notes:

1. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
2. Also specified to meet curves in FC-PI 13.0 Figures 18 and 19, which allow trade-off between wavelength, spectral width and OMA.
3. Equivalent extinction ratio specification for Fiber Channel. Allows smaller ER at higher average power.
4. Unfiltered, 20-80%. Complies with IEEE 802.3 (Gig. E), FC 1x and 2x eye masks when filtered.
5. Measured with DJ-free data iMeasured with DJ-free data ion, output DJ will be the sum of input DJ and Δ DJ.
6. Measured with conformance signals defined in FC-PI 13.0 specifications.
7. Measured with PRBS 27-1 at 10-12 BER.

Fiber Optic Accessories

Fiber Optic Attenuators

HAPP-ETEC singlemode attenuators are used in communication systems to reduce the optical power launched onto receivers. These high performance devices give accurate attenuation and they are designed to be plugged directly onto the ends of the fiber optical cable and inserted into the appropriate adapter.

These fiber optical attenuators are available in FC, LC, MU, SC, ST connector styles with PC and APC finish and for a wavelength operation of 1310nm (others on request).

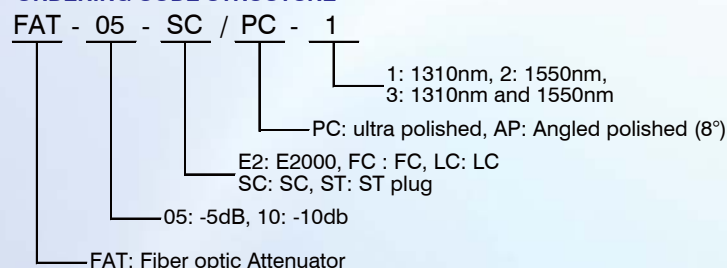


Standard types:
Connector/Cable style

Order code :

FC/PC	FAT-05-FC/PC-1
FC/APC	FAT-05-FC/AP-1
LC/PC	FAT-05-LC/PC-1
MU/PC	FAT-05-MU/PC-1
SC/PC	FAT-05-SC/PC-1
SC/APC	FAT-05-SC/AP-1

ORDERING CODE STRUCTURE



Features:

- Plug-in type
- Ultra low back reflection
- Accurate attenuation
- RoHS compliant

Applications:

- Telecommunications Networks
- CATV
- FTTX
- LAN and WAN
- Test & Measurement

Specifications:

Available attenuation:

Attenuation tolerance:

Return Loss:

Operating wavelength:

Temperature range:

1.0 to 30 dB with 1.0dB increments

up to 5dB = +/- 0.5dB / as of 5dB

= +/- 10% of nominal value

PC (ultra polished style) >55dB

/ APC (angled polished style) >60dB

1310nm (others on request)

-40°C to +85°C

Fiber Optic Adapters

The fiber optic adapters are used to mate two connectors together within a distribution panel or wall box. the HAPP-ETEC fiber optic adapters are precision made to ensure perfect alignment of the connections in order to keep the insertion loss to a minimum. Phosphor bronze sleeves are for general use and the ceramic versions are generally used in singlemode low loss environments. The MTRJ and MPO connectors incorporate two small alignment pins, so that the fiber optic adapter for these two versions simply supports and locks the connectors together.

E2000



Multimode Simplex
Beige color
FAD-E2/PC-E2/PC-MS-F



Singlemode Simplex
Blue color
FAD-E2/PC-E2/PC-SS-F



Singlemode APC Simplex
Green color
FAD-E2/AP-E2/AP-SS-F

FC



Multimode Simplex
Black cap
FAD-FC/PC-FC/PC-MS-D



Singlemode Simplex
Yellow cap
FAD-FC/PC-FC/PC-SS-D



Singlemode APC Simplex
Green cap
FAD-FC/AP-FC/AP-SS-D

LC



Multimode Duplex
Beige color
FAD-LC/PC-LC/PC-MD-F



Singlemode Duplex
Blue color
FAD-LC/PC-LC/PC-SD-F



Singlemode APC Duplex
Green color
FAD-LC/AP-LC/AP-SD-F



Quad Multimode
Beige color
FAD-LC/PC-LC/PC-MQ-F

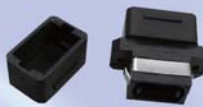


Quad Singlemode
Blue color
FAD-LC/PC-LC/PC-SQ-F

MTRJ & MPO



Multimode MTRJ Duplex
Black color
FAD-MT/PC-MT/PC-MD-F



Multimode MPO Simplex PC
Black color
FAD-MP/PC-MP/PC-MS-F



Singlemode MPO Simplex APC
Black color
FAD-MP/AP-MP/AP-SS-F

MU



Singlemode
Metal color
FAD-MU/PC-MU/PC-SD-F

Fiber Optic Accessories

Fiber Optic Adapters

SC



Multimode Simplex
Beige color
FAD-SC/PC-SC/PC-MS-F



Singlemode Simplex
Blue color
FAD-SC/PC-SC/PC-SS-F



Singlemode APC Simplex
Green color
FAD-SC/AP-SC/AP-SS-F



Multimode Duplex
Beige color
FAD-SC/PC-SC/PC-MD-F



Singlemode Duplex
Blue color
FAD-SC/PC-SC/PC-SD-F



Singlemode APC Duplex
Green color
FAD-SC/AP-SC/AP-SD-F

ST



Multimode Simplex
Black cap
FAD-ST/PC-ST/PC-MS-D



Singlemode Simplex
Yellow cap
FAD-ST/PC-ST/PC-SS-D

Hybrid



SC-ST Multimode Duplex
Beige color
FAD-SC/PC-ST/PC-MD-F



SC-ST Singlemode Duplex
Blue color
FAD-SC/PC-ST/PC-SD-F



SC-FC Singlemode Simplex
Blue color
FAD-SC/PC-FC/PC-SS-F

Keystone Jack adapters



Blank type
White color
FAD-KT-BK-W



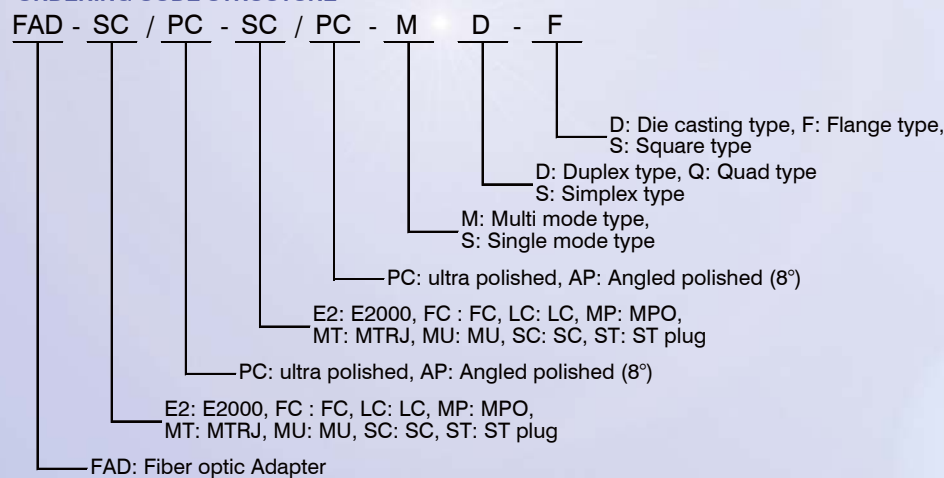
LC Duplex/SC type (square)
White color
FAD-KT-SC-W



ST type (round)
White color
FAD-KT-ST-W

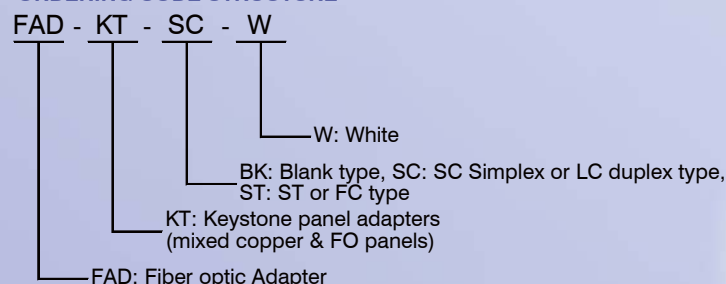
Fiber Optic Adapters

ORDERING CODE STRUCTURE



Keystone Jack Adapters

ORDERING CODE STRUCTURE



Fiber Optic Patch Panels

Sliding Patch Panels

FC, ST Patch Panels (Sliding tray style)

24-port



Order Code (empty 24-port patch panel): **SPP-24-N-FC/ST-ME-B**

Adapters

With	FC Multimode – 24 Port	FC Singlemode – 24 Port
4 adapters	SPP-24-N-FC/PC-MS-ME-04-B	SPP-24-N-FC/PC-SS-ME-04-B
8 adapters	SPP-24-N-FC/PC-MS-ME-08-B	SPP-24-N-FC/PC-SS-ME-08-B
12 adapters	SPP-24-N-FC/PC-MS-ME-12-B	SPP-24-N-FC/PC-SS-ME-12-B
16 adapters	SPP-24-N-FC/PC-MS-ME-16-B	SPP-24-N-FC/PC-SS-ME-16-B
fully loaded	SPP-24-N-FC/PC-MS-ME-24-B	SPP-24-N-FC/PC-SS-ME-24-B
Adapters only	FAD-FC/PC-FC/PC-MS-D	FAD-FC/PC-FC/PC-SS-D

With	FC APC Singlemode – 24 Port
4 adapters	SPP-24-N-FC/AP-SS-ME-04-B
8 adapters	SPP-24-N-FC/AP-SS-ME-08-B
12 adapters	SPP-24-N-FC/AP-SS-ME-12-B
16 adapters	SPP-24-N-FC/AP-SS-ME-16-B
fully loaded	SPP-24-N-FC/AP-SS-ME-24-B
Adapters only	FAD-FC/AP-FC/AP-SS-D

Adapters

With	ST Multimode – 24 Port	ST Singlemode – 24 Port
4 adapters	SPP-24-N-ST/PC-MS-ME-04-B	SPP-24-N-ST/PC-SS-ME-04-B
8 adapters	SPP-24-N-ST/PC-MS-ME-08-B	SPP-24-N-ST/PC-SS-ME-08-B
12 adapters	SPP-24-N-ST/PC-MS-ME-12-B	SPP-24-N-ST/PC-SS-ME-12-B
16 adapters	SPP-24-N-ST/PC-MS-ME-16-B	SPP-24-N-ST/PC-SS-ME-16-B
fully loaded	SPP-24-N-ST/PC-MS-ME-24-B	SPP-24-N-ST/PC-SS-ME-24-B
Adapters only	FAD-ST/PC-ST/PC-MS-D	FAD-ST/PC-ST/PC-SS-D

Specifications:

Dimensions: Width 19" (483mm), Depth 8" (200mm), Height 1u (44mm)
 Weight: 2.6 kilos (fully loaded), Color: Black (grey on request),
 Cable entry: 4x10mm & 2x20mm gland holes

See Cable Management Accessories for further options

Sliding Patch Panels

E2000, LC, MTRJ Patch Panels

(Sliding tray style – vertical adapter position)

24-port



Order Code (empty 24-port patch panel): **SPP-24-V-E2/LC/MT/SC-ME-B**

Adapters

With	E2000 Multimode – 24 Port	E2000 Singlemode – 24 Port
4 adapters	SPP-24-V-E2/PC-MS-ME-04-B	SPP-24-V-E2/PC-SS-ME-04-B
8 adapters	SPP-24-V-E2/PC-MS-ME-08-B	SPP-24-V-E2/PC-SS-ME-08-B
12 adapters	SPP-24-V-E2/PC-MS-ME-12-B	SPP-24-V-E2/PC-SS-ME-12-B
16 adapters	SPP-24-V-E2/PC-MS-ME-16-B	SPP-24-V-E2/PC-SS-ME-16-B
fully loaded	SPP-24-V-E2/PC-MS-ME-24-B	SPP-24-V-E2/PC-SS-ME-24-B
Adapters only	FAD-E2/PC-E2/PC-MS-F	FAD-E2/PC-E2/PC-SS-F
With	E2000 APC Singlemode - 24 Port	MTRJ – 24 Port
4 adapters	SPP-24-V-E2/AP-SS-ME-04-B	SPP-24-V-MT/PC-MD-ME-04-B
8 adapters	SPP-24-V-E2/AP-SS-ME-08-B	SPP-24-V-MT/PC-MD-ME-08-B
12 adapters	SPP-24-V-E2/AP-SS-ME-12-B	SPP-24-V-MT/PC-MD-ME-12-B
16 adapters	SPP-24-V-E2/AP-SS-ME-16-B	SPP-24-V-MT/PC-MD-ME-16-B
fully loaded	SPP-24-V-E2/AP-SS-ME-24-B	SPP-24-V-MT/PC-MD-ME-24-B
Adapters only	FAD-E2/AP-E2/AP-SS-F	FAD-MT/PC-MT/PC-MD-F
With	LC Multimode Duplex– 24 Port	LC Singlemode Duplex– 24 Port
4 adapters	SPP-24-V-LC/PC-MD-ME-04-B	SPP-24-V-LC/PC-SD-ME-04-B
8 adapters	SPP-24-V-LC/PC-MD-ME-08-B	SPP-24-V-LC/PC-SD-ME-08-B
12 adapters	SPP-24-V-LC/PC-MD-ME-12-B	SPP-24-V-LC/PC-SD-ME-12-B
16 adapters	SPP-24-V-LC/PC-MD-ME-16-B	SPP-24-V-LC/PC-SD-ME-16-B
fully loaded	SPP-24-V-LC/PC-MD-ME-24-B	SPP-24-V-LC/PC-SD-ME-24-B
Adapters only	FAD-LC/PC-LC/PC-MD-F	FAD-LC/PC-LC/PC-SD-F

Specifications:

Dimensions: Width 19" (483mm), Depth 8" (200mm), Height 1u (44mm)

Weight: 2.6 kilos (fully loaded), Color: Black (grey on request),

Cable entry: 4x10mm & 2x20mm gland holes

See Cable Management Accessories for further options

Fiber Optic Patch Panels

Sliding Patch Panels

SC Patch Panels
(Sliding tray style – vertical adapter position)

24-port



Order Code (empty 24-port patch panel): **SPP-24-V-SC-ME-B**

Adapters	With	SC Multimode Simplex – 24 Port	SC Singlemode Simplex– 24 Port
	4 adapters	SPP-24-V-SC/PC-MS-ME-04-B	SPP-24-V-SC/PC-SS-ME-04-B
	8 adapters	SPP-24-V-SC/PC-MS-ME-08-B	SPP-24-V-SC/PC-SS-ME-08-B
	12 adapters	SPP-24-V-SC/PC-MS-ME-12-B	SPP-24-V-SC/PC-SS-ME-12-B
	16 adapters	SPP-24-V-SC/PC-MS-ME-16-B	SPP-24-V-SC/PC-SS-ME-16-B
	fully loaded	SPP-24-V-SC/PC-MS-ME-24-B	SPP-24-V-SC/PC-SS-ME-24-B
	Adapters only	FAD-SC/PC-SC/PC-MS-F	FAD-SC/PC-SC/PC-SS-F
	With	SC Singlemode APC Simplex– 24 Port	
	4 adapters	SPP-24-V-SC/AP-SS-ME-04-B	
	8 adapters	SPP-24-V-SC/AP-SS-ME-08-B	
	12 adapters	SPP-24-V-SC/AP-SS-ME-12-B	
	16 adapters	SPP-24-V-SC/AP-SS-ME-16-B	
	fully loaded	SPP-24-V-SC/AP-SS-ME-24-B	
	Adapters only	FAD-SC/AP-SC/AP-SS-F	

Specifications:

Dimensions: Width 19" (483mm), Depth 8" (200mm), Height 1u (44mm)
 Weight: 2.6 kilos (fully loaded), Color: Black (grey on request),
 Cable entry: 4x10mm & 2x20mm gland holes

See Cable Management Accessories for further options

Sliding Patch Panels

LC-Quad & SC Duplex Patch Panels

(Sliding tray style – horizontal adapter position)

8-port



Order Code (empty 8-port patch panel): **SPP-08-H-LCQ/SCD-ME-B**

Adapters

With	LC Quad Multimode – 8 Port	LC Quad Singlemode – 8 Port
2 adapters	SPP-08-H-LC/PC-MQ-ME-02-B	SPP-08-H-LC/PC-SQ-ME-02-B
4 adapters	SPP-08-H-LC/PC-MQ-ME-04-B	SPP-08-H-LC/PC-SQ-ME-04-B
fully loaded	SPP-08-H-LC/PC-MQ-ME-08-B	SPP-08-H-LC/PC-SQ-ME-08-B
Adapters only	FAD-LC/PC-LC/PC-MQ-F	FAD-LC/PC-LC/PC-SQ-F

With	SC Multimode Duplex – 8 Port	SC Singlemode Duplex – 8 Port
2 adapters	SPP-08-H-SC/PC-MD-ME-02-B	SPP-08-H-SC/PC-SD-ME-02-B
4 adapters	SPP-08-H-SC/PC-MD-ME-04-B	SPP-08-H-SC/PC-SD-ME-04-B
fully loaded	SPP-08-H-SC/PC-MD-ME-08-B	SPP-08-H-SC/PC-SD-ME-08-B
Adapters only	FAD-SC/PC-SC/PC-MD-F	FAD-SC/PC-SC/PC-SD-F

With	SC APC Singlemode Duplex – 8 Port
2 adapters	SPP-08-H-SC/AP-SD-ME-02-B
4 adapters	SPP-08-H-SC/AP-SD-ME-04-B
fully loaded	SPP-08-H-SC/AP-SD-ME-08-B
Adapters only	FAD-SC/AP-SC/AP-SD-F

Specifications:

Dimensions: Width 19" (483mm), Depth 8" (200mm), Height 1u (44mm)
 Weight: 2.6 kilos (fully loaded), Color: Black (grey on request),
 Cable entry: 4x10mm & 2x20mm gland holes

See Cable Management Accessories for further options

Fiber Optic Patch Panels

Sliding Patch Panels

LC-Quad & SC Duplex Patch Panels
(Sliding tray style – vertical adapter position)



12-port

Order Code (empty 12-port patch panel): **SPP-12-V-LCQ/SCD-ME-B**

Adapters	With	LC Quad Multimode – 12 Port	LC Quad Singlemode – 12 Port
	4 adapters	SPP-12-V-LC/PC-MQ-ME-04-B	SPP-12-V-LC/PC-SQ-ME-04-B
	8 adapters	SPP-12-V-LC/PC-MQ-ME-08-B	SPP-12-V-LC/PC-SQ-ME-08-B
	fully loaded	SPP-12-V-LC/PC-MQ-ME-12-B	SPP-12-V-LC/PC-SQ-ME-12-B
	Adapters only	FAD-LC/PC-LC/PC-MQ-F	FAD-LC/PC-LC/PC-SQ-F
	With	SC Multimode Duplex – 12 Port	SC Singlemode Duplex – 12 Port
	4 adapters	SPP-12-V-SC/PC-MD-ME-04-B	SPP-12-V-SC/PC-SD-ME-04-B
	8 adapters	SPP-12-V-SC/PC-MD-ME-08-B	SPP-12-V-SC/PC-SD-ME-08-B
	fully loaded	SPP-12-V-SC/PC-MD-ME-12-B	SPP-12-V-SC/PC-SD-ME-12-B
	Adapters only	FAD-SC/PC-SC/PC-MD-F	FAD-SC/PC-SC/PC-SD-F
	With	SC APC Singlemode Duplex – 12 Port	
	4 adapters	SPP-12-V-SC/AP-SD-ME-04-B	
	8 adapters	SPP-12-V-SC/AP-SD-ME-08-B	
	fully loaded	SPP-12-V-SC/AP-SD-ME-12-B	
	Adapters only	FAD-SC/AP-SC/AP-SD-F	

Specifications:

Dimensions: Width 19" (483mm), Depth 8" (200mm), Height 1u (44mm)
 Weight: 2.6 kilos (fully loaded), Color: Black (grey on request),
 Cable entry: 4x10mm & 2x20mm gland holes

See Cable Management Accessories for further options

Sliding Patch Panels

LC-Quad & SC Duplex Patch Panels

(Sliding tray style – vertical adapter position)

24-port



Order Code (empty 24-port patch panel): **SPP-24-V-LCQ/SCD-ME-B**

Adapters

With	LC Quad Multimode – 24 Port	LC Quad Singlemode – 24 Port
4 adapters	SPP-24-V-LC/PC-MQ-ME-04-B	SPP-24-V-LC/PC-SQ-ME-04-B
8 adapters	SPP-24-V-LC/PC-MQ-ME-08-B	SPP-24-V-LC/PC-SQ-ME-08-B
12 adapters	SPP-24-V-LC/PC-MQ-ME-12-B	SPP-24-V-LC/PC-SQ-ME-12-B
16 adapters	SPP-24-V-LC/PC-MQ-ME-16-B	SPP-24-V-LC/PC-SQ-ME-16-B
fully loaded	SPP-24-V-LC/PC-MQ-ME-24-B	SPP-24-V-LC/PC-SQ-ME-24-B
Adapters only	FAD-LC/PC-LC/PC-MQ-F	FAD-LC/PC-LC/PC-SQ-F
With	SC Multimode Duplex – 24 Port	SC Singlemode Duplex – 24 Port
4 adapters	SPP-24-V-SC/PC-MD-ME-04-B	SPP-24-V-SC/PC-SD-ME-04-B
8 adapters	SPP-24-V-SC/PC-MD-ME-08-B	SPP-24-V-SC/PC-SD-ME-08-B
12 adapters	SPP-24-V-SC/PC-MD-ME-12-B	SPP-24-V-SC/PC-SD-ME-12-B
16 adapters	SPP-24-V-SC/PC-MD-ME-16-B	SPP-24-V-SC/PC-SD-ME-16-B
fully loaded	SPP-24-V-SC/PC-MD-ME-24-B	SPP-24-V-SC/PC-SD-ME-24-B
Adapters only	FAD-SC/PC-SC/PC-MD-F	FAD-SC/PC-SC/PC-SD-F
With	SC APC Singlemode Duplex – 24 Port	
4 adapters	SPP-24-V-SC/AP-SD-ME-04-B	
8 adapters	SPP-24-V-SC/AP-SD-ME-08-B	
12 adapters	SPP-24-V-SC/AP-SD-ME-12-B	
16 adapters	SPP-24-V-SC/AP-SD-ME-16-B	
fully loaded	SPP-24-V-SC/AP-SD-ME-24-B	
Adapters only	FAD-SC/AP-SC/AP-SD-F	

Specifications:

Dimensions: Width 19" (483mm), Depth 8" (200mm), Height 1u (44mm)
 Weight: 2.6 kilos (fully loaded), Color: Black (grey on request),
 Cable entry: 4x10mm & 2x20mm gland holes

See Cable Management Accessories for further options

Fiber Optic Patch Panels

Sliding Patch Panels

E2000, LC, MTRJ, SC Patch Panels

(Sliding tray style – angled adapter position)

8-port



Order Code (empty 8-port patch panel): **SPP-08-A-E2/LC/MT/SC-ME-B**

Adapters

With	E2000 Multimode – 8 Port	E2000 Singlemode – 8 Port
2 adapters	SPP-08-A-E2/PC-MS-ME-02-B	SPP-08-A-E2/PC-SS-ME-02-B
4 adapters	SPP-08-A-E2/PC-MS-ME-04-B	SPP-08-A-E2/PC-SS-ME-04-B
fully loaded	SPP-08-A-E2/PC-MS-ME-08-B	SPP-08-A-E2/PC-SS-ME-08-B
Adapters only	FAD-E2/PC-E2/PC-MS-F	FAD-E2/PC-E2/PC-SS-F
With	E2000 APC Singlemode - 8 Port	MTRJ – 8 Port
2 adapters	SPP-08-A-E2/AP-SS-ME-02-B	SPP-08-A-MT/PC-MD-ME-02-B
4 adapters	SPP-08-A-E2/AP-SS-ME-04-B	SPP-08-A-MT/PC-MD-ME-04-B
fully loaded	SPP-08-A-E2/AP-SS-ME-08-B	SPP-08-A-MT/PC-MD-ME-08-B
Adapters only	FAD-E2/AP-E2/AP-SS-F	FAD-MT/PC-MT/PC-MD-F
With	LC Multimode Duplex– 8 Port	LC Singlemode Duplex– 8 Port
2 adapters	SPP-08-A-LC/PC-MD-ME-02-B	SPP-08-A-LC/PC-SD-ME-02-B
4 adapters	SPP-08-A-LC/PC-MD-ME-04-B	SPP-08-A-LC/PC-SD-ME-04-B
fully loaded	SPP-08-A-LC/PC-MD-ME-08-B	SPP-08-A-LC/PC-SD-ME-08-B
Adapters only	FAD-LC/PC-LC/PC-MD-F	FAD-LC/PC-LC/PC-SD-F
With	SC Multimode Simplex-8 Port	SC Singlemode Simplex-8 Port
2 adapters	SPP-08-A-SC/PC-MS-ME-02-B	SPP-08-A-SC/PC-SS-ME-02-B
4 adapters	SPP-08-A-SC/PC-MS-ME-04-B	SPP-08-A-SC/PC-SS-ME-04-B
fully loaded	SPP-08-A-SC/PC-MS-ME-08-B	SPP-08-A-SC/PC-SS-ME-08-B
Adapters only	FAD-SC/PC-SC/PC-MS-F	FAD-SC/PC-SC/PC-SS-F
With	SC Singlemode APC Simplex– 8 Port	
2 adapters	SPP-08-A-SC/AP-SS-ME-02-B	
4 adapters	SPP-08-A-SC/AP-SS-ME-04-B	
fully loaded	SPP-08-A-SC/AP-SS-ME-08-B	
Adapters only	FAD-SC/AP-SC/AP-SS-F	

Specifications:

Dimensions: Width 19" (483mm), Depth 8" (200mm), Height 1u (44mm)

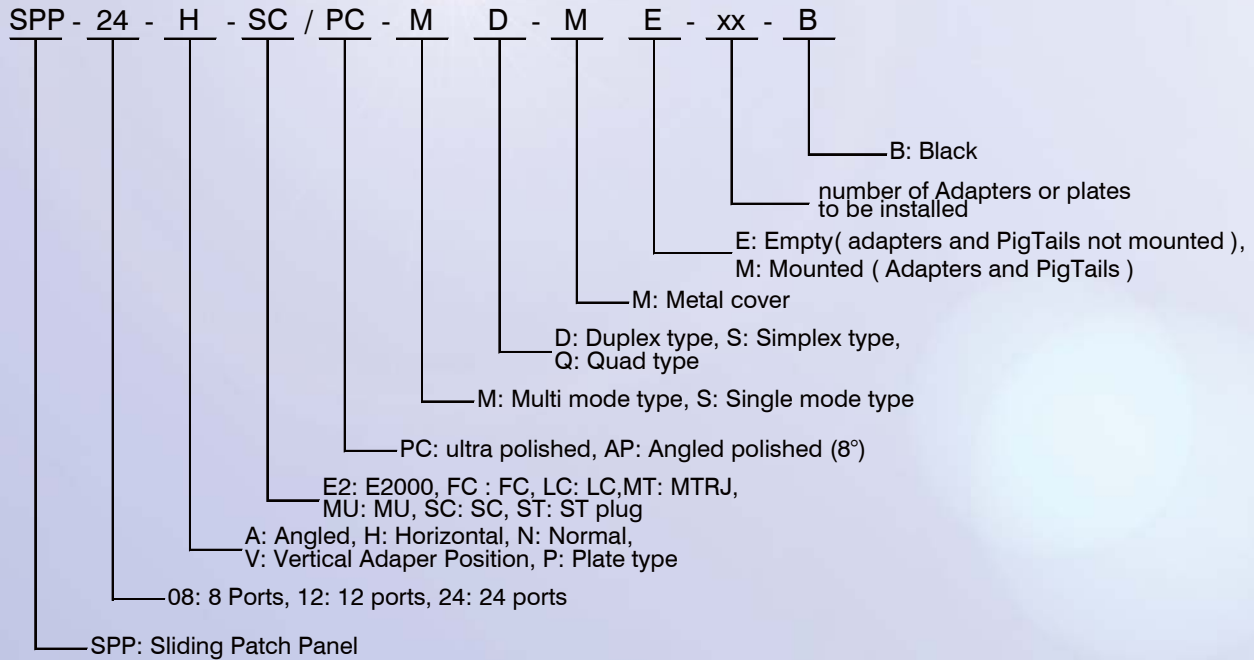
Weight: 2.6 kilos (fully loaded), Color: Black (grey on request),

Cable entry: 4x10mm & 2x20mm gland holes

See Cable Management Accessories for further options

Sliding Patch Panels

ORDERING CODE STRUCTURE



Sliding Patch Modules (Sliding tray style)

Sliding Patch Panels Module Patch Plate

E2000 Multimode – 8 Port



8 port adapter
Adapters only

MPP-08-V-E2/PC-MS
FAD-E2/PC-E2/PC-MS-F

E2000 Singlemode – 8 Port



8 port adapter
Adapters only

MPP-08-V-E2/PC-SS
FAD-E2/PC-E2/PC-SS-F

E2000 APC Singlemode – 8 Port



8 port adapter
Adapters only

MPP-08-V-E2/AP-SS
FAD-E2/AP-E2/AP-SS-F

MTRJ – 8 Port



8 port adapter
Adapters only

MPP-08-V-MT/PC-MD
FAD-MT/PC-MT/PC-MD-F

FC Multimode – 8 Port



8 port adapter
Adapters only

MPP-08-Z-FC/PC-MS
FAD-FC/PC-FC/PC-MS-D

FC Singlemode – 8 Port



8 port adapter
Adapters only

MPP-08-Z-FC/PC-SS
FAD-FC/PC-FC/PC-SS-D

FC APC Singlemode – 8 Port



8 port adapter
Adapters only

MPP-08-Z-FC/AP-SS
FAD-FC/AP-FC/AP-SS-D

LC Multimode Duplex – 8 Port



8 port adapter
Adapters only

MPP-08-V-LC/PC-MD
FAD-LC/PC-LC/PC-MD-F

LC Singlemode Duplex – 8 Port



8 port adapter
Adapters only

MPP-08-V-LC/PC-SD
FAD-LC/PC-LC/PC-SD-F

LC APC Singlemode Duplex – 8 Port



8 port adapter
Adapters only

MPP-08-V-LC/AP-SD
FAD-LC/AP-LC/AP-SD-F

Fiber Optic Patch Panels

Sliding Patch Panels Module Patch Plate

LC Quad Multimode– 6 Port



6 port adapter
Adapters only

MPP-06-V-LC/PC-MQ
FAD-LC/PC-LC/PC-MQ-F

LC Quad Singlemode – 6 Port



6 port adapter
Adapters only

MPP-06-V-LC/PC-SQ
FAD-LC/PC-LC/PC-SQ-F

SC Multimode Duplex – 6 Port



6 port adapter
Adapters only

MPP-06-H-SC/PC-MD
FAD-SC/PC-SC/PC-MD-F

SC Singlemode Duplex – 6 Port



6 port adapter
Adapters only

MPP-06-H-SC/PC-SD
FAD-SC/PC-SC/PC-SD-F

SC Multimode Simplex – 8 Port



8 port adapter
Adapters only

MPP-08-V-SC/PC-MS
FAD-SC/PC-SC/PC-MS-F

SC Singlemode Simplex – 8 Port



8 port adapter
Adapters only

MPP-08-V-SC/PC-SS
FAD-SC/PC-SC/PC-SS-F

SC APC Singlemode Simplex – 8 Port



8 port adapter
Adapters only

MPP-08-V-SC/AP-SS
FAD-SC/AP-SC/AP-SS-F

ST Multimode – 8 Port



8 port adapter
Adapters only

MPP-08-Z-ST/PC-MS
FAD-ST/PC-ST/PC-MS-D

ST Singlemode – 8 Port



8 port adapter
Adapters only

MPP-08-Z-ST/PC-SS
FAD-ST/PC-ST/PC-SS-D

Blank Plate



Blank cover plate

MPP-BLANK

Sliding Patch Panels

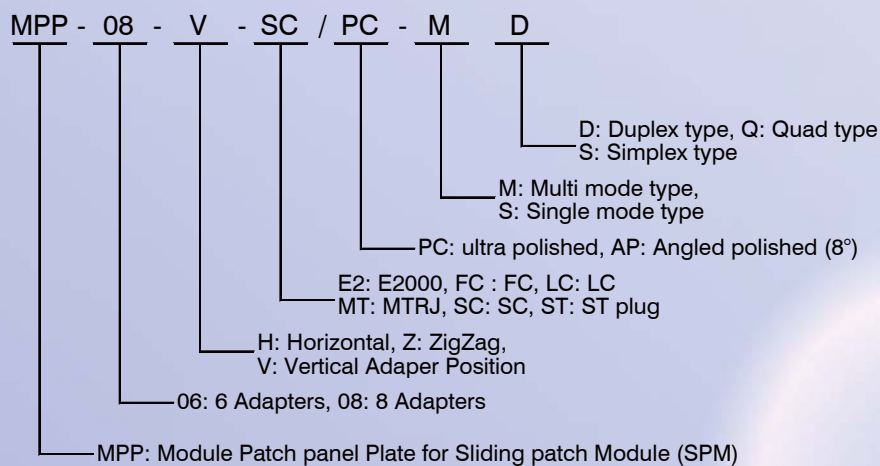
Module Patch Plate

Specifications:

Dimensions: Width 19" (483mm), Depth 8" (200mm), Height 1u (44mm)
 Weight: 2.6 kilos (fully loaded), Color: Black (grey on request),
 Cable entry: 4x10mm & 2x20mm gland holes

See Cable Management Accessories for further options

ORDERING CODE STRUCTURE



Fiber Optic Patch Panels

Universal Dual Plate Patch Panels

E2000, FC, LC Duplex, MTRJ, MU, SC Simplex, ST Patch Panels



12-port: **PLK-D-12-1U-0-M**

Blank patch panel only / black color
Adapters & jacks to be ordered separately

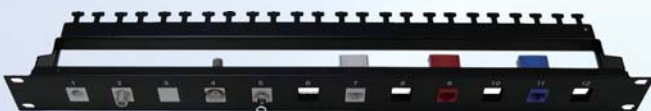


16-port: **PLK-D-16-1U-0-M**

Blank patch panel only / black color
Adapters & jacks to be ordered separately

Universal patch panel assembly examples:

12-port example:

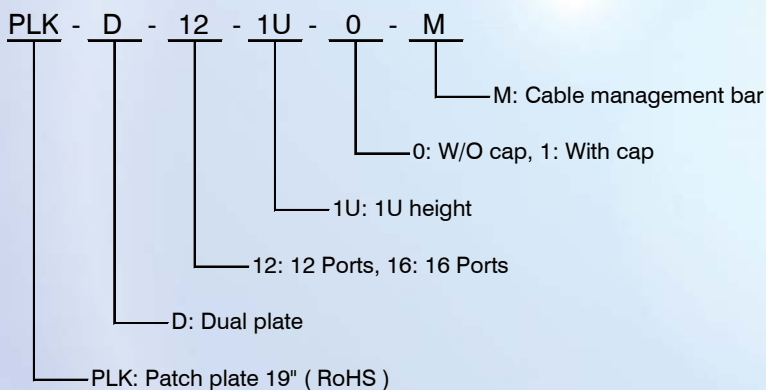


16-port example



The Universal Dual Plate Patch Panels are assembled first with the « Panel adapters » which allow to use this universal patch panel with the various types of fiber optic adapters

ORDERING CODE STRUCTURE



Universal Dual Plate Patch Panel Accessories

1. Panel adapters:



FAD-KT-SC-W

Square hole type
Panel adapter for
E2000 Simplex, LC Duplex
MTRJ, MU or SC Simplex
White Color



FAD-KT-ST-W

Round hole type
Panel adapter for
FC or ST
White Color



FAD-KT-BK-W

Blank type
Panel adapter to close
unused holes in patchpanel
White Color

2. Fiber Optic adapters

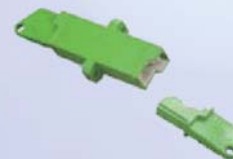


E2000

Multimode Simplex
Beige color
FAD-E2/PC-E2/PC-MS-F



Singlemode Simplex
Blue color
FAD-E2/PC-E2/PC-SS-F



Singlemode APC Simplex
Green color
FAD-E2/AP-E2/AP-SS-F



FC

Multimode Simplex
Black cap
FAD-FC/PC-FC/PC-MS-D



Singlemode Simplex
Yellow cap
FAD-FC/PC-FC/PC-SS-D



Singlemode APC Simplex
Green cap
FAD-FC/AP-FC/AP-SS-D



LC

Multimode Duplex
Beige color
FAD-LC/PC-LC/PC-MD-F



Singlemode Duplex
Blue color
FAD-LC/PC-LC/PC-SD-F



Singlemode APC Duplex
Green color
FAD-LC/AP-LC/AP-SD-F



MTRJ & MU

Multimode MTRJ Duplex
Black color
FAD-MT/PC-MT/PC-MD-F



MU Singlemode
Blue color
FAD-MU/PC-MU/PC-SD-F

Fiber Optic Patch Panel Accessories

Universal Dual Plate Patch Panel Accessories

SC



Multimode Simplex
Beige color
FAD-SC/PC-SC/PC-MS-F



Singlemode Simplex
Blue color
FAD-SC/PC-SC/PC-SS-F



Singlemode APC Simplex
Green color
FAD-SC/AP-SC/AP-SS-F



Multimode Duplex
Beige color
FAD-SC/PC-SC/PC-MD-F



Singlemode Duplex
Blue color
FAD-SC/PC-SC/PC-SD-F



Singlemode APC Duplex
Green color
FAD-SC/AP-SC/AP-SD-F

ST



Multimode Simplex
Black cap
FAD-ST/PC-ST/PC-MS-D

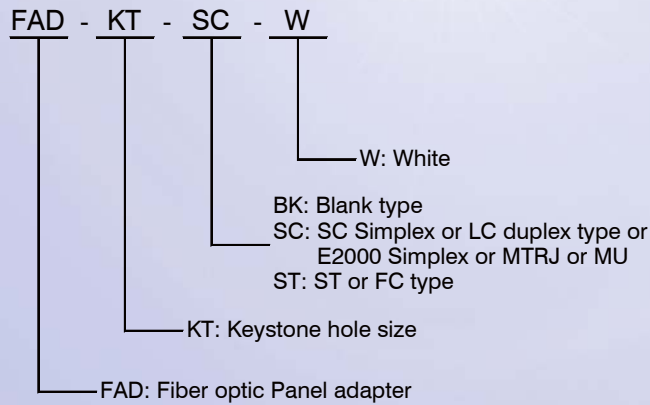


Singlemode Simplex
Yellow cap
FAD-ST/PC-ST/PC-SS-D

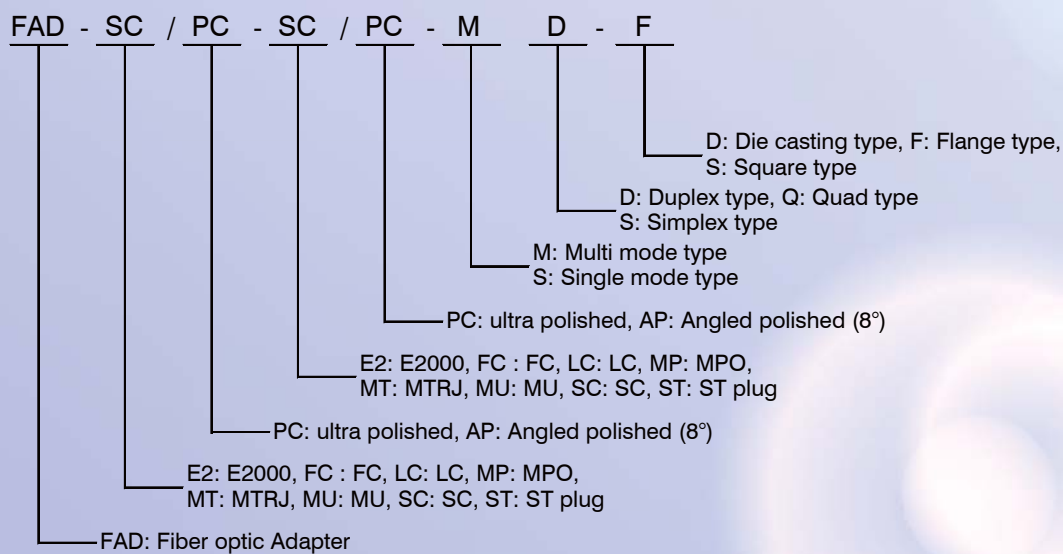
Universal Dual Plate Patch Panel Accessories

ORDERING CODE STRUCTURE

1. Panel Adapters



2. Fiber Optic Adapters



Fiber Optic Wall Boxes

Lockable Wall Boxes

FC, ST Wall boxes

(Lockable – Double door style)

48-port



Order Code (empty 48-port wall box): **LWB-48-D-FC/ST-ME-G**

Adapters

With	FC Multimode – 48 Port	FC Singlemode – 48 Port
24 adapters	LWB-48-D-FC/PC-MS-ME-24-G	LWB-48-D-FC/PC-SS-ME-24-G
36 adapters	LWB-48-D-FC/PC-MS-ME-36-G	LWB-48-D-FC/PC-SS-ME-36-G
fully loaded	LWB-48-D-FC/PC-MS-ME-48-G	LWB-48-D-FC/PC-SS-ME-48-G
Adapters only	FAD-FC/PC-FC/PC-MS-D	FAD-FC/PC-FC/PC-SS-D
With	FC APC Singlemode – 48 Port	
24 adapters	LWB-48-D-FC/AP-SS-ME-24-G	
36 adapters	LWB-48-D-FC/AP-SS-ME-36-G	
fully loaded	LWB-48-D-FC/AP-SS-ME-48-G	
Adapters only	FAD-FC/AP-FC/AP-SS-D	
With	ST Multimode – 48 Port	ST Singlemode – 48 Port
24 adapters	LWB-48-D-ST/PC-MS-ME-24-G	LWB-48-D-ST/PC-SS-ME-24-G
36 adapters	LWB-48-D-ST/PC-MS-ME-36-G	LWB-48-D-ST/PC-SS-ME-36-G
fully loaded	LWB-48-D-ST/PC-MS-ME-48-G	LWB-48-D-ST/PC-SS-ME-48-G
Adapters only	FAD-ST/PC-ST/PC-MS-D	FAD-ST/PC-ST/PC-SS-D

Specifications:

Dimensions: Width 355mm, Depth 90mm, Height 365mm

Weight: 4.0 kilos (fully loaded), Color: Grey, 4 x 20mm gland holes

See Cable Management Accessories for further options

Lockable Wall Boxes

LC Quad, SC Duplex Wall boxes
(Lockable – Double door style)

36-port



Order Code (empty 36-port wall box): **LWB-36-D-LCQ/SCD-ME-G**

Adapters

With	LC Quad Multimode – 36 Port	LC Quad Singlemode – 36 Port
18 adapters	LWB-36-D-LC/PC-MQ-ME-18-G	LWB-36-D-LC/PC-SQ-ME-18-G
24 adapters	LWB-36-D-LC/PC-MQ-ME-24-G	LWB-36-D-LC/PC-SQ-ME-24-G
fully loaded	LWB-36-D-LC/PC-MQ-ME-36-G	LWB-36-D-LC/PC-SQ-ME-36-G
Adapters only	FAD-LC/PC-LC/PC-MQ-F	FAD-LC/PC-LC/PC-SQ-F
With	SC Multimode Duplex – 36 Port	SC Singlemode Duplex – 36 Port
18 adapters	LWB-36-D-SC/PC-MD-ME-18-G	LWB-36-D-SC/PC-SD-ME-18-G
24 adapters	LWB-36-D-SC/PC-MD-ME-24-G	LWB-36-D-SC/PC-SD-ME-24-G
fully loaded	LWB-36-D-SC/PC-MD-ME-36-G	LWB-36-D-SC/PC-SD-ME-36-G
Adapters only	FAD-SC/PC-SC/PC-MD-F	FAD-SC/PC-SC/PC-SD-F
With	SC APC Singlemode Duplex – 36 Port	
18 adapters	LWB-36-D-SC/AP-SD-ME-18-G	
24 adapters	LWB-36-D-SC/AP-SD-ME-24-G	
fully loaded	LWB-36-D-SC/AP-SD-ME-36-G	
Adapters only	FAD-SC/AP-SC/AP-SD-F	

Specifications:

Dimensions: Width 355mm, Depth 90mm, Height 365mm
Weight: 4.0 kilos (fully loaded), Color: Grey, 4 x 20mm gland holes

See Cable Management Accessories for further options

Fiber Optic Wall Boxes

Lockable Wall Boxes

FC, ST Wall boxes

(Lockable – Single door style)

24-port



Order Code (empty 24-port wall box): **LWB-24-S-FC/ST-ME-G**

Adapters

With	FC Multimode – 24 Port	FC Singlemode – 24 Port
6 adapters	LWB-24-S-FC/PC-MS-ME-06-G	LWB-24-S-FC/PC-SS-ME-06-G
12 adapters	LWB-24-S-FC/PC-MS-ME-12-G	LWB-24-S-FC/PC-SS-ME-12-G
fully loaded	LWB-24-S-FC/PC-MS-ME-24-G	LWB-24-S-FC/PC-SS-ME-24-G
Adapters only	FAD-FC/PC-FC/PC-MS-D	FAD-FC/PC-FC/PC-SS-D
With	FC APC Singlemode – 24 Port	
6 adapters	LWB-24-S-FC/AP-SS-ME-06-G	
12 adapters	LWB-24-S-FC/AP-SS-ME-12-G	
fully loaded	LWB-24-S-FC/AP-SS-ME-24-G	
Adapters only	FAD-FC/AP-FC/AP-SS-D	
With	ST Multimode – 24 Port	ST Singlemode – 24 Port
6 adapters	LWB-24-S-ST/PC-MS-ME-06-G	LWB-24-S-ST/PC-SS-ME-06-G
12 adapters	LWB-24-S-ST/PC-MS-ME-12-G	LWB-24-S-ST/PC-SS-ME-12-G
fully loaded	LWB-24-S-ST/PC-MS-ME-24-G	LWB-24-S-ST/PC-SS-ME-24-G
Adapters only	FAD-ST/PC-ST/PC-MS-D	FAD-ST/PC-ST/PC-SS-D

Specifications:

Dimensions: Width 225mm, Depth 50mm, Height 270mm

Weight: 2.0 kilos (fully loaded), Color: Grey, 2 x 20mm gland holes

See Cable Management Accessories for further options

Lockable Wall Boxes

E2000, LC, MTRJ, SC Wall boxes
(Lockable – Single door style)

18-port



Order Code (empty 18-port wall box): **LWB-18-S-E2/LC/MT/SC-ME-G**

Adapters

With	E2000 Multimode – 18 Port	E2000 Singlemode – 18 Port
4 adapters	LWB-18-S-E2/PC-MS-ME-04-G	LWB-18-S-E2/PC-SS-ME-04-G
6 adapters	LWB-18-S-E2/PC-MS-ME-06-G	LWB-18-S-E2/PC-SS-ME-06-G
12 adapters	LWB-18-S-E2/PC-MS-ME-12-G	LWB-18-S-E2/PC-SS-ME-12-G
fully loaded	LWB-18-S-E2/PC-MS-ME-18-G	LWB-18-S-E2/PC-SS-ME-18-G
Adapters only	FAD-E2/PC-E2/PC-MS-F	FAD-E2/PC-E2/PC-SS-F
With	E2000 APC Singlemode - 18 Port	MTRJ – 18 Port
4 adapters	LWB-18-S-E2/AP-SS-ME-04-G	LWB-18-S-MT/PC-MD-ME-04-G
6 adapters	LWB-18-S-E2/AP-SS-ME-06-G	LWB-18-S-MT/PC-MD-ME-06-G
12 adapters	LWB-18-S-E2/AP-SS-ME-12-G	LWB-18-S-MT/PC-MD-ME-12-G
fully loaded	LWB-18-S-E2/AP-SS-ME-18-G	LWB-18-S-MT/PC-MD-ME-18-G
Adapters only	FAD-E2/AP-E2/AP-SS-F	FAD-MT/PC-MT/PC-MD-F
With	LC Multimode Duplex– 18 Port	LC Singlemode Duplex– 18 Port
4 adapters	LWB-18-S-LC/PC-MD-ME-04-G	LWB-18-S-LC/PC-SD-ME-04-G
6 adapters	LWB-18-S-LC/PC-MD-ME-06-G	LWB-18-S-LC/PC-SD-ME-06-G
12 adapters	LWB-18-S-LC/PC-MD-ME-12-G	LWB-18-S-LC/PC-SD-ME-12-G
fully loaded	LWB-18-S-LC/PC-MD-ME-18-G	LWB-18-S-LC/PC-SD-ME-18-G
Adapters only	FAD-LC/PC-LC/PC-MD-F	FAD-LC/PC-LC/PC-SD-F
With	SC Multimode Simplex – 18 Port	SC Singlemode Simplex– 18 Port
4 adapters	LWB-18-S-SC/PC-MS-ME-04-G	LWB-18-S-SC/PC-SS-ME-04-G
6 adapters	LWB-18-S-SC/PC-MS-ME-06-G	LWB-18-S-SC/PC-SS-ME-06-G
12 adapters	LWB-18-S-SC/PC-MS-ME-12-G	LWB-18-S-SC/PC-SS-ME-12-G
fully loaded	LWB-18-S-SC/PC-MS-ME-18-G	LWB-18-S-SC/PC-SS-ME-18-G
Adapters only	FAD-SC/PC-SC/PC-MS-F	FAD-SC/PC-SC/PC-SS-F
With	SC Singlemode APC Simplex– 18 Port	
4 adapters	LWB-18-S-SC/AP-SS-ME-04-G	
6 adapters	LWB-18-S-SC/AP-SS-ME-06-G	
12 adapters	LWB-18-S-SC/AP-SS-ME-12-G	
fully loaded	LWB-18-S-SC/AP-SS-ME-18-G	
Adapters only	FAD-SC/AP-SC/AP-SS-F	

Specifications:

Dimensions: Width 225mm, Depth 50mm, Height 270mm
Weight: 2.0 kilos (fully loaded), Color: Grey, 2 x 20mm gland holes

See Cable Management Accessories for further options

Fiber Optic Wall Boxes

Lockable Wall Boxes

LC-Quad & SC Duplex Wall boxes
(Lockable – Single door style)

12-port



Order Code (empty 12-port wall box): **LWB-12-S-LCQ/SCD-ME-G**

Adapters

With	LC Quad Multimode – 12 Port	LC Quad Singlemode – 12 Port
4 adapters	LWB-12-S-LC/PC-MQ-ME-04-G	LWB-12-S-LC/PC-SQ-ME-04-G
8 adapters	LWB-12-S-LC/PC-MQ-ME-08-G	LWB-12-S-LC/PC-SQ-ME-08-G
fully loaded	LWB-12-S-LC/PC-MQ-ME-12-G	LWB-12-S-LC/PC-SQ-ME-12-G
Adapters only	FAD-LC/PC-LC/PC-MQ-F	FAD-LC/PC-LC/PC-SQ-F
With	SC Multimode Duplex – 12 Port	SC Singlemode Duplex – 12 Port
4 adapters	LWB-12-S-SC/PC-MD-ME-04-G	LWB-12-S-SC/PC-SD-ME-04-G
8 adapters	LWB-12-S-SC/PC-MD-ME-08-G	LWB-12-S-SC/PC-SD-ME-08-G
fully loaded	LWB-12-S-SC/PC-MD-ME-12-G	LWB-12-S-SC/PC-SD-ME-12-G
Adapters only	FAD-SC/PC-SC/PC-MD-F	FAD-SC/PC-SC/PC-SD-F
With	SC APC Singlemode Duplex – 12 Port	
4 adapters	LWB-12-S-SC/AP-SD-ME-04-G	
8 adapters	LWB-12-S-SC/AP-SD-ME-08-G	
fully loaded	LWB-12-S-SC/AP-SD-ME-12-G	
Adapters only	FAD-SC/AP-SC/AP-SD-F	

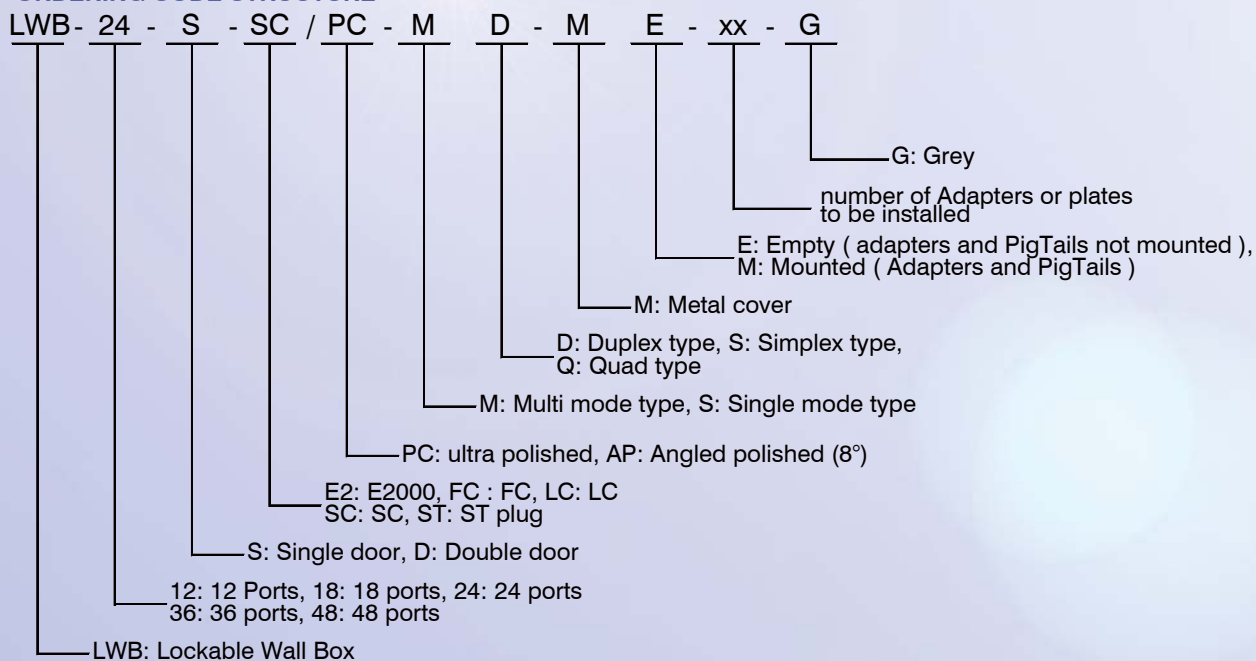
Specifications:

Dimensions: Width 225mm, Depth 50mm, Height 270mm
Weight: 2.0 kilos (fully loaded), Color: Grey, 2 x 20mm gland holes

See Cable Management Accessories for further options

Lockable Wall Boxes

ORDERING CODE STRUCTURE



Cable Management Accessories

Cable Management Accessories



Splice Tray & Lid

Universal splice tray:

Lid for Splice tray:

CMA-SP-TRAY

CMA-SP-TRAYLID



CMA-SP-TRAYHOLDER-1

CMA-SP-TRAYHOLDER-2

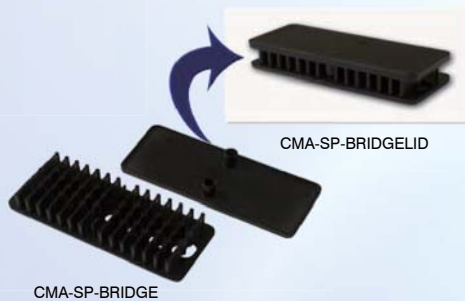
Splice Tray Splice Holders

Splice holder for heatshrink splice:

Splice holder for crimp splice:

CMA-SP-TRAYHOLDER-1

CMA-SP-TRAYHOLDER-2



Splice Bridge & Lid

Splice Bridge :

Lid for Splice Bridge:

CMA-SP-BRIDGE

CMA-SP-BRIDGELID



Splice Cassette with Clear Lid

Splice Cassette Base unit :

2x6 way base unit with clear lid

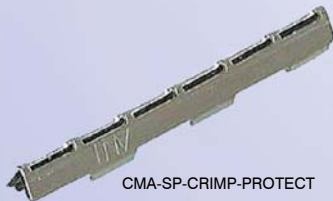
CMA-SP-CASSETTE-BASE-12

Stackable splice cassette:

2x6 way stackable splice
cassette with clear lid

CMA-SP-CASSETTE-ADD-12

Cable Management Accessories



CMA-SP-CRIMP-PROTECT

Crimp Splice Protector
Metal crimp splice protector

CMA-SP-CRIMP-PROTECT



CMA-SC-S-BLANK



CMA-ST-BLANK



CMA-SC-D-BLANK

Blanks for Panels
ST Blank Plug
SC Duplex Blank Plug
SC Simplex Blank Plug

CMA-ST-BLANK

CMA-SC-D-BLANK

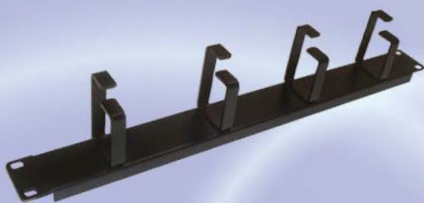
CMA-SC-S-BLANK



CMA-GLAND-EG13.5

Cable Gland
Cable Gland

CMA-GLAND-EG13.5



CMA-BAR

Cable Management Bar
Cable Management Bar

CMA-BAR

Cable Management Accessories

Cable Management Accessories



Dust Caps

ST Singlemode dust cap (yellow)

CMA-ST-S-YL

ST Multimode dust cap (black)
(delivered in packs of 100 pieces)

CMA-ST-M-BK

SC dust cap (transparent)
(delivered in packs of 1000 pieces)

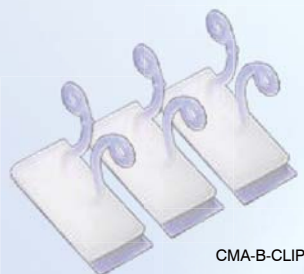
CMA-SC-TR

SC APC dust cap (green)
(delivered in packs of 1000 pieces)

CMA-SC-GR

LC dust cap (white)

CMA-LC-WH



Bunny Clip

Bunny clip for cable management

CMA-B-CLIP

CMA-SP-PROTECT-45



Splice Protectors

45mm Splice protector (transparent)

CMA-SP-PROTECT-45

60mm Splice protector (transparent)

CMA-SP-PROTECT-60



Cable Management Kit

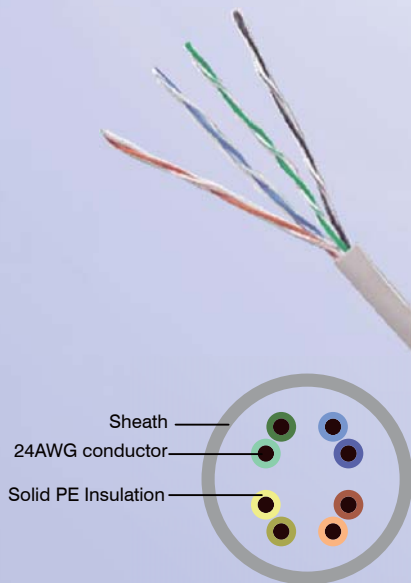
Cable Management Kit

CMA-KIT

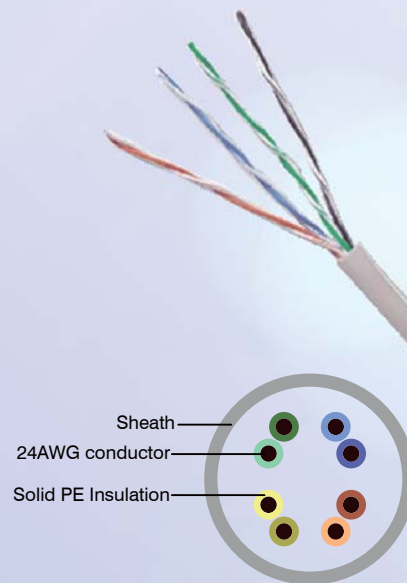
Cable General Information

HAPP-ETEC offers a full range of Cat 5e and Cat 6 cable assemblies in unshielded and fully shielded versions and which are available in all common colors. LSNH cable coating is also available optionally. These cables correspond to the TIA-EIA-568A and ISO 11801 standards and they exceed the respective Cat 5e and Cat 6 specifications. The individual cable constructions can be found here below:

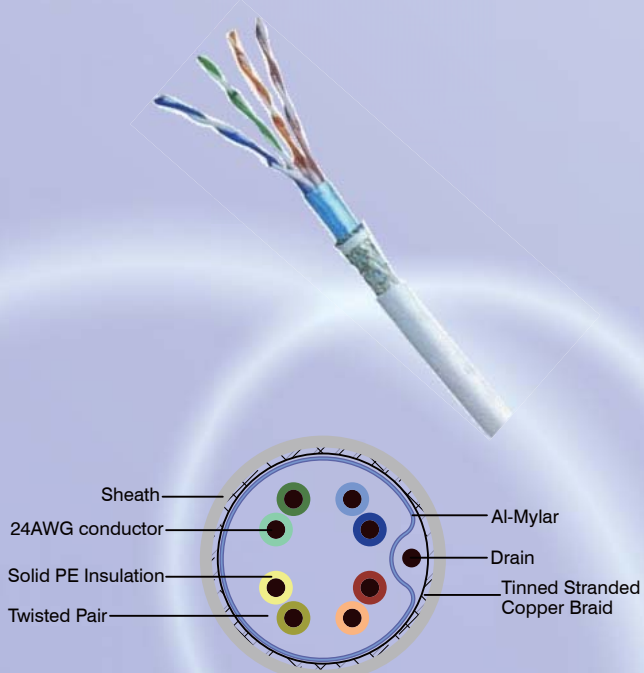
UTP Cat 5e cable construction



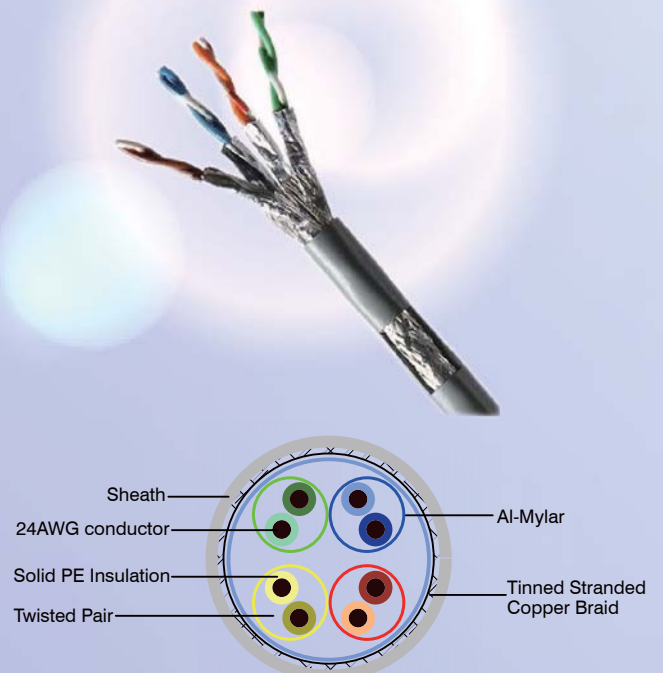
UTP Cat 6 cable construction



SSTP Cat 5e cable construction



SFTP Cat 6 LSNH cable construction



Copper Cable

Cat 5e Standard Patch Cords

HAPP-ETEC offers the Cat 5e patch cords in a comprehensive range colors and special color requirements are available on request also.



Cat 5e cable ordering codes

		Cat 5e UTP Unshielded patch cable		Cat 5e SSTP Fully shielded patch cable
Grey		CBL-3-MU-xx.xM-GY-N		CBL-3-MF-xx.xM-GY
Red		CBL-3-MU-xx.xM-RD-N		CBL-3-MF-xx.xM-RD
Orange		CBL-3-MU-xx.xM-OR-N		CBL-3-MF-xx.xM-OR
Yellow		CBL-3-MU-xx.xM-YL-N		CBL-3-MF-xx.xM-YL
Green		CBL-3-MU-xx.xM-GN-N		CBL-3-MF-xx.xM-GN
Blue		CBL-3-MU-xx.xM-BU-N		CBL-3-MF-xx.xM-BU
Black		CBL-3-MU-xx.xM-BK-N		CBL-3-MF-xx.xM-BK
White		CBL-3-MU-xx.xM-WH-N		CBL-3-MF-xx.xM-WH

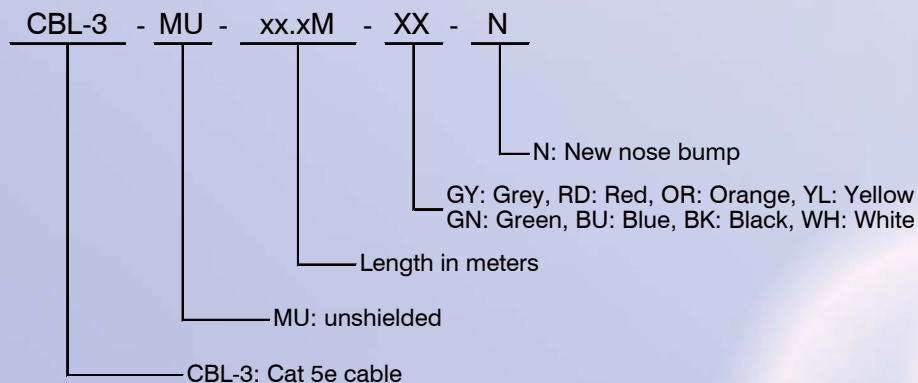
Cat 5e Standard Patch Cords

OPTIONS

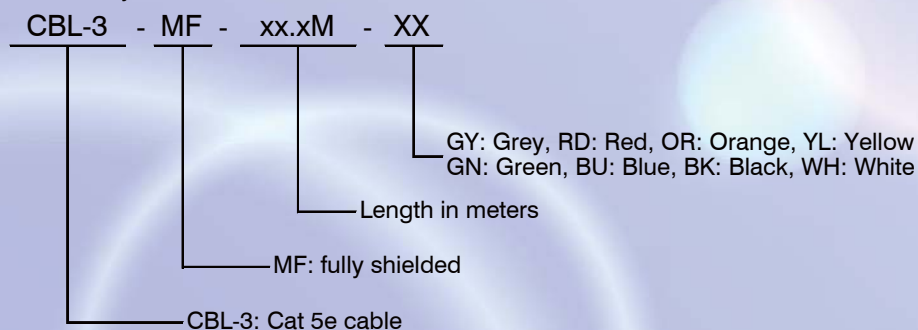
Cable length:	Replace "xx.x" by cable length in meter (example: 01.0 = 1 meter cable)
Standard cable lengths:	0.3, 0.6, 1, 1.5, 2, 3, 5, 7, 10 & 20 meters (others on request)
Standard colors:	Grey (GY), Red (RD), Orange (OR), Yellow (YL), Green (GN), Blue (BU), Black (BK), White (WH) Others on request

ORDERING CODE STRUCTURE

Cat 5e unshielded:



Cat 5e fully shielded:



Copper Cable

Cat 5e & Cat 6 Special Patch Cords

HAPP-ETEC also offers special 2-pair cables generally used for telephone installations (standard green color).

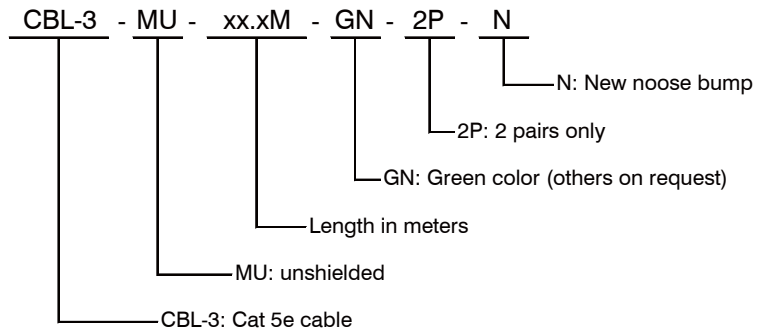
We also offer red color crossed cables which are identified by a black overmold on each extremity for UTP cables and grey color crossed cables which are identified by a black overmold on each extremity for SSTP.

Cat 5e – special 2-pair UTP (green color)



Length	Order Code
0.3 meter	CBL-3-MU-00.3M-GN-2P-N
0.6 meter	CBL-3-MU-00.6M-GN-2P-N
1.0 meter	CBL-3-MU-01.0M-GN-2P-N
1.5 meter	CBL-3-MU-01.5M-GN-2P-N
2.0 meter	CBL-3-MU-02.0M-GN-2P-N
3.0 meter	CBL-3-MU-03.0M-GN-2P-N

ORDERING CODE STRUCTURE



4-pair crossed cables (red color with black overmold)

Cat 5e UTP



Length	Order Code
0.3 meter	CBL-3-MU/R-00.3M-RD/BK-N
0.6 meter	CBL-3-MU/R-00.6M-RD/BK-N
1.0 meter	CBL-3-MU/R-01.0M-RD/BK-N
1.5 meter	CBL-3-MU/R-01.5M-RD/BK-N
2.0 meter	CBL-3-MU/R-02.0M-RD/BK-N
3.0 meter	CBL-3-MU/R-03.0M-RD/BK-N
5.0 meter	CBL-3-MU/R-05.0M-RD/BK-N
7.0 meter	CBL-3-MU/R-07.0M-RD/BK-N
10 meter	CBL-3-MU/R-10.0M-RD/BK-N
20 meter	CBL-3-MU/R-20.0M-RD/BK-N

Cat 5e SSTP



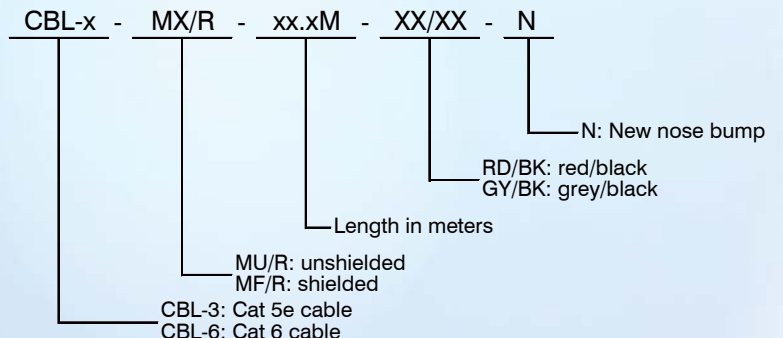
Length	Order Code
0.6 meter	CBL-3-MF/R-00.6M-GY/BK
1.0 meter	CBL-3-MF/R-01.0M-GY/BK
2.0 meter	CBL-3-MF/R-02.0M-GY/BK
3.0 meter	CBL-3-MF/R-03.0M-GY/BK
5.0 meter	CBL-3-MF/R-05.0M-GY/BK
10.0 meter	CBL-3-MF/R-10.0M-GY/BK
20.0 meter	CBL-3-MF/R-20.0M-GY/BK

Cat 6 UTP



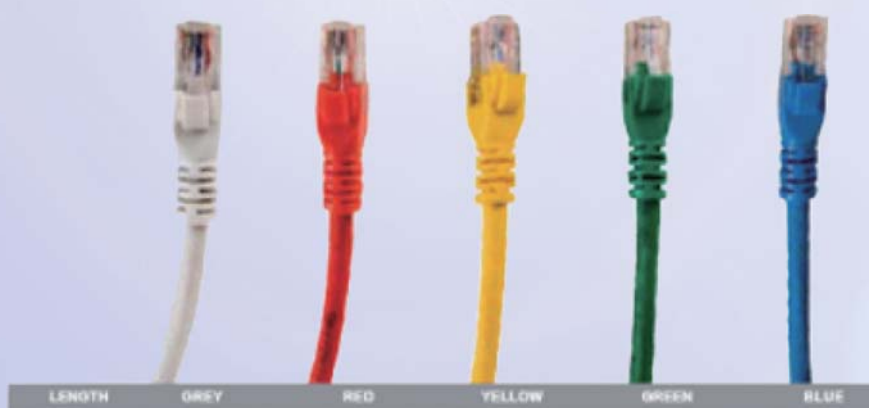
Length	Order Code
0.5 meter	CBL-6-MU/R-00.5M-RD/BK-N
1.0 meter	CBL-6-MU/R-01.0M-RD/BK-N
1.5 meter	CBL-6-MU/R-01.5M-RD/BK-N
2.0 meter	CBL-6-MU/R-02.0M-RD/BK-N
3.0 meter	CBL-6-MU/R-03.0M-RD/BK-N
5.0 meter	CBL-6-MU/R-05.0M-RD/BK-N
7.0 meter	CBL-6-MU/R-07.0M-RD/BK-N
10 meter	CBL-6-MU/R-10.0M-RD/BK-N

ORDERING CODE STRUCTURE



Cat 6 Standard Patch Cords

HAPP-ETEC offers the Cat 6 patch cables in a comprehensive range colors and special color requirements are available on request also.



Cat 6 cable ordering codes

Cat 6 UTP
Unshielded patchcable

Cat 6 SFTP
Shielded and Foiled
Twisted pairs

Grey



CBL-6-MU-xx.xM-GY-N



CBL-6-MF-xx.xM-GY-LN

Red



CBL-6-MU-xx.xM-RD-N



CBL-6-MF-xx.xM-RD-LN

Yellow



CBL-6-MU-xx.xM-YL-N



CBL-6-MF-xx.xM-YL-LN

Green



CBL-6-MU-xx.xM-GN-N



CBL-6-MF-xx.xM-GN-LN

Blue



CBL-6-MU-xx.xM-BU-N



CBL-6-MF-xx.xM-BU-LN

Copper Cable

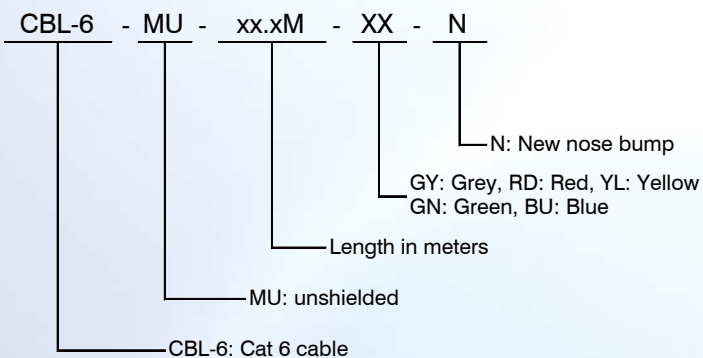
Cat 6 Standard Patch Cords

OPTIONS

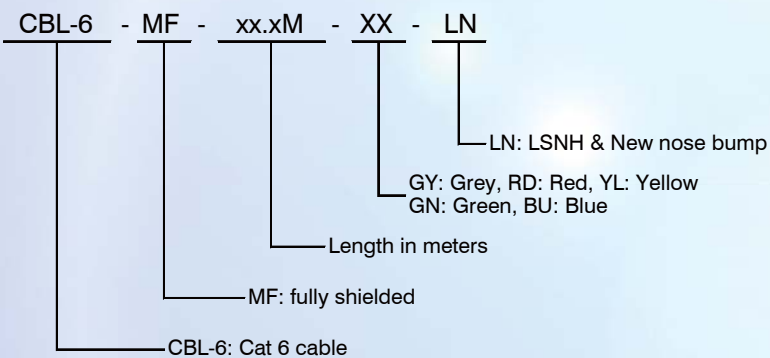
Cable length:	Replace "xx.x" by cable length in meter (example: 01.0 = 1 meter cable)
Standard cable lengths:	0.5, 1, 1.5, 2, 3, 5, 7, 10 meters (others on request)
Standard colors:	Grey (GY), Red (RD), Yellow (YL), Green (GN), Blue (BU) Others on request

ORDERING CODE STRUCTURE

Cat 6 unshielded:



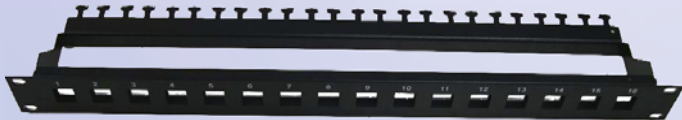
Cat 6 fully shielded:



Patch Panels

HAPP-ETEC offers high reliability patch panels for Cat5e and Cat6 requirements for copper cable management, as well as mixed copper & fiber optic patch cable management.

1. Universal dual plate patch panel for keystone jacks & fiber optical adapters (unshielded)



For vertical & horizontal keystone jacks:

12-port: **PLK-D-12-1U-0-M**

16-port: **PLK-D-16-1U-0-M**

Only for slim horizontal keystone jacks & slim inline couplers:

24-port: **PLK-D-24-1U-0-M**

Blank patch panel only / black color
Adapters & jacks to be ordered separately

Universal patch panel assembly examples:

Copper cable assembly



Mixed copper & fiber optic assembly



Fiber optic assembly



2. Horizontal Cat 5e & Cat 6 patch panel (unshielded)

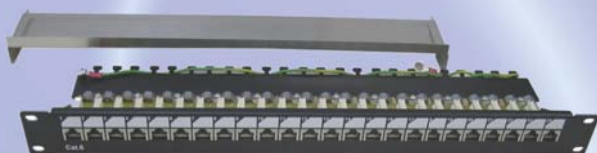


Cat 5e - 24-port: **PLH-5-U-24-D-0-0-M**

Cat 6 - 24-port: **PLH-6-U-24-D-0-0-M**

Mounted with dual type jacks / black color

3. Vertical Cat 5e & Cat 6 patch panel (shielded)



Cat 5e - 24-port: **PLV-5-F-24-D-0-1**

Cat 6 - 24-port: **PLV-6-F-24-D-0-1**

Mounted with dual type jacks / Black color

Copper Cable Accessories

Patch Panel Accessories

- 1 Slim Horizontal Keystone Jacks – Unshielded type for 24-port patch plate (16.3mm)



Cat 5e : **KSJ-5-H-U-D-1-W**

Cat 6: **KSJ-6-H-U-D-1-W**

Keystone jack type: Dual / unshielded / white color

- 2 Slim Horizontal Keystone Jacks –shielded type for 24-port patch plate (16.3mm)

Cat 5e : **KSJ-5-H-S-D-1-M**

Cat 6: **KSJ-6-H-S-D-1-M**

Keystone jack type: Dual / shielded / metal color

- 3 Vertical Keystone Jacks – Unshielded type

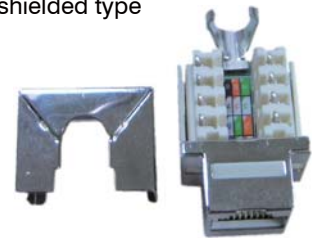


Cat 5e : **KSJ-5-V-U-D-1-W**

Cat 6: **KSJ-6-V-U-D-1-W**

Keystone jack type: Dual / unshielded / white color

- 4 Vertical Keystone Jacks –shielded type



Cat 5e : **KSJ-5-V-S-D-1-M**

Cat 6: **KSJ-6-V-S-D-1-M**

Keystone jack type: Dual / shielded / metal color

- 5 Slim in-line coupler RJ45– unshielded type for 24-port patch plate



Cat 5e : **ILC-5-U-KT-S-B**

Cat 6: **ILC-6-U-KT-S-B**

RJ45 coupler: unshielded / slim type / BLACK color

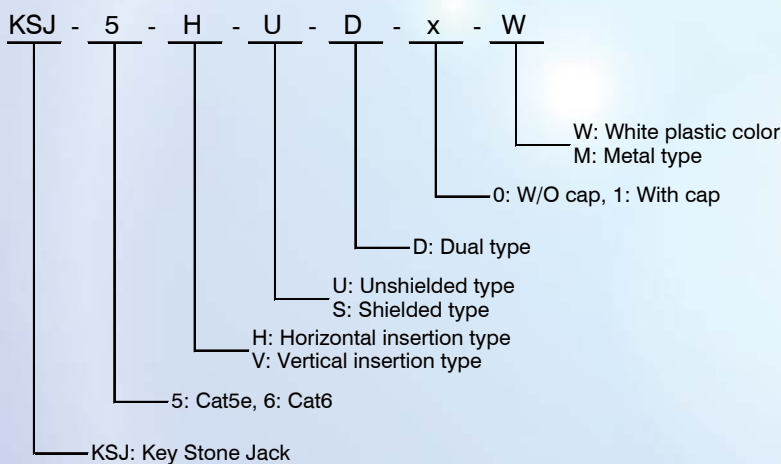
- 6 Blank plates (inserts to close holes in patch panel)



Order code: **FAD-KT-BK-W**

Plate type: Blank / white color

ORDERING CODE STRUCTURE





E-tec Interconnect Ltd.

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CH-1072 Forel (Lavaux)
Switzerland

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