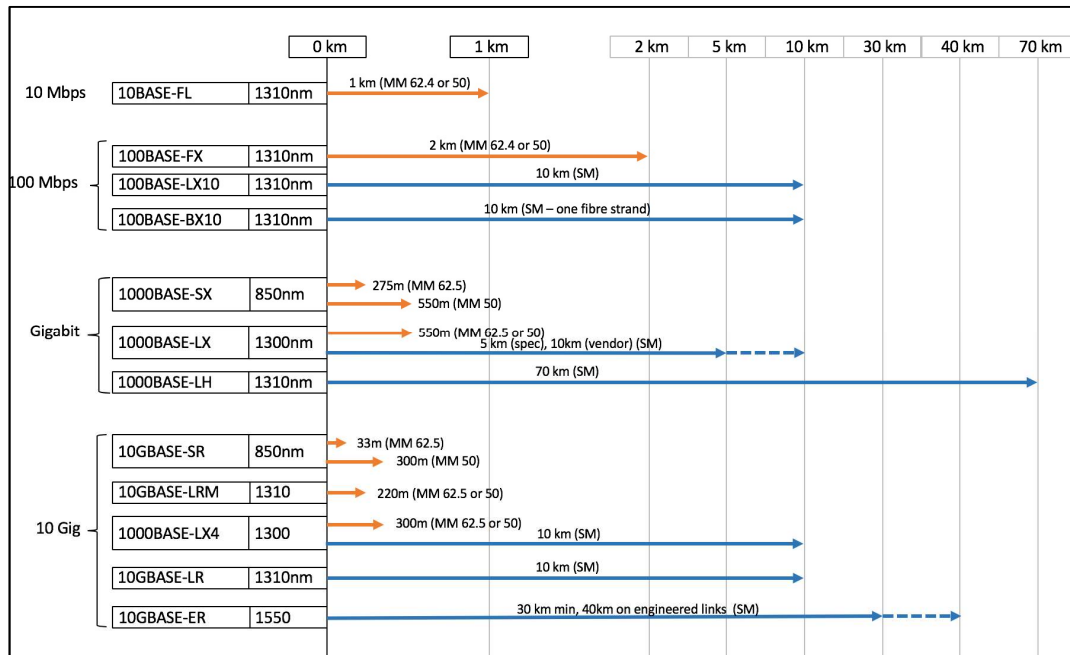
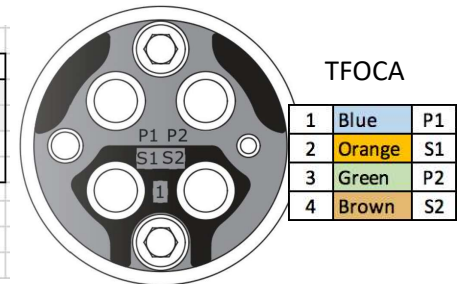
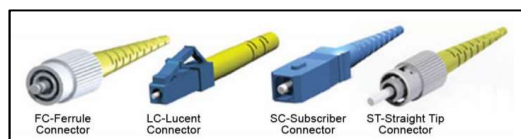


Multi Mode Fibre (MMF)				Bandwidth (Mhz x km)								
				850nm OFL	1300nm OFL	850nm LL	Common use	100MB	1000B-SX	10GB-S	40GB-SR4	100GB-SR10
OM1	62.5µ/125µ	LED	Orange	200	500	NA	100Mbps	2000m	275m	33m		
OM2	50µ/125µ	LED	Orange	500	500	NA	1Gbps	2000m	550m	82m		
OM3	50µ/125µ	VCSEL	Aqua	1300	500	2000	10Gbps	2000m	550m	300m	100m	100m
OM4	50µ/125µ	VCSEL	Aqua	2500	500	4700	100Gbps	2000m	1000m	550m	150m	150m

Single Mode Fibre (SMF)				Reach (typical)			1300nm and 1310nm are considered a single wavelength (1300nm) by NIST for devices they design or test.					
OS1	9µ/125µ	Indoor	Yellow	2km								
OS2	9µ/125µ	Outdoor	Yellow	10km	only for >2km							

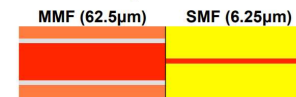


Standard	Cisco Part #	Wavelength	Modes	Max Distance	Perle Part #	Brocade Part #	Allied-Tellis Part #
100BASE-FX	GLC-FE-100FX	1310nm	MM	2km	PSPF-100-M2LC2	33224-100	SP-FE-FX-CDFM
	GLC-GE-100FX	1300nm	MM	2km			
100BASE-LX10	GLC-FE-100LX	1310nm	SM	10km	PSPF-100D-S2LC10		
100BASE-BX10	GLC-FE-100BX	1310nm	SM	10km			
100BASE-EX10	GLC-FE-100EX	1310nm	SM	40km	PSPF-100D-S2LC40		
100BASE-ZX10	GLC-FE-100ZX	1550nm	SM	80km	PSPF-100D-S2LC80		
100BASE-SX	GLC-SX-MMD	850nm	MM	550m			
1000BASE-SX	GLC-SM-MM/SFP-GE-S	850nm	MM	550,220m	PSPF-1000D-M2LC05	33210-100 1GE SX	
1000BASE-LX/LH	GLC-LH-SM/SFP-GE-L	1300nm	MM, SM	550,10km	PSPF-1000-S2LC10		
1000BASE-ZX	GLC-ZX-SM/SFP-GE-Z	1550nm	SM	70km			
1000BASE-BX	GLC-BX-D/GLC-BX-U	1490nm	SM	10km			



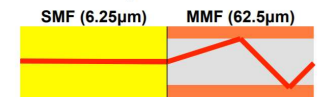
What Happens When You...?

MMF Optic into SMF



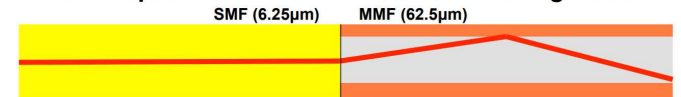
The vast majority of the light is lost in the coupling, rendering the signal unusable after more than a few feet.

SMF Optic into MMF



The less focused signal propagates fine, but starts to bounce around once inside the MMF, causing modal distortions which limit distance.

SMF Optic into MMF via Mode Conditioning Cable

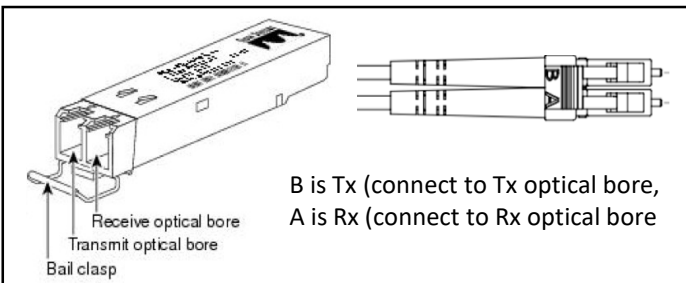


A Mode Conditioning Cable (MCC) is a cable with SMF on one end and MMF on the other, joined by a precise fusion splice. This splice sets the optimum angle of entry into the MMF, causing fewer modal distortions.

Single-mode devices can operate either on single-mode fiber or multimode fiber, while multimode devices are limited to multimode fiber operation.



Figure 2: Color coding and fiber cable for single-mode SFP and multimode SFP.



Fibre Optic Finishes (as something different than Connector type)

Summary:

Flat Fiber -> Physical Contact (PC) -> Ultra Physical Contact (UPC) -> APC

The first three connectors are all inter-mateable, whereas the APC isn't.

"PC and UPC connectors cannot and should not be mated. Not only does it cause poor performance since the fiber cores will not touch, but it can also destroy both connectors."

Return Loss (lower is better) - function of connector ferrule polishing style

Insertion Loss (Lower is better)

There is no doubt that the optical performance of APC connectors is better than UPC connectors.

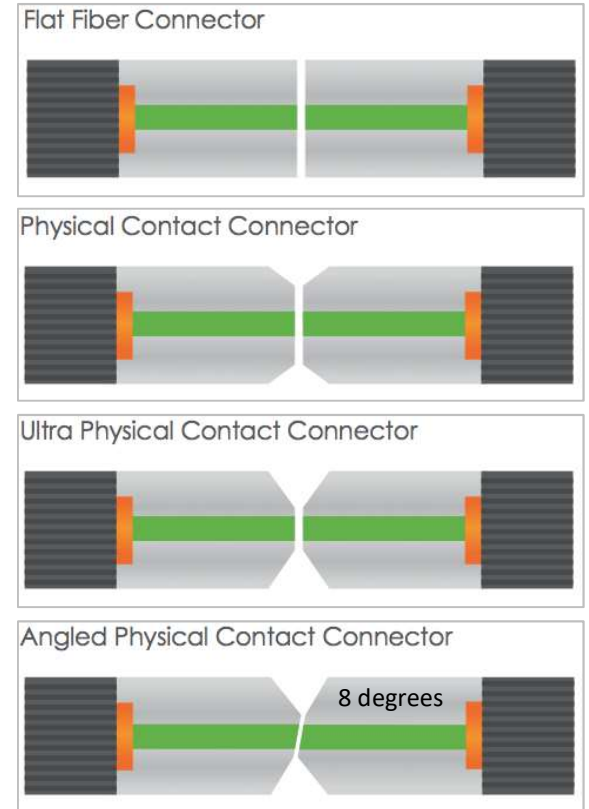
Return Loss:

UPC connector is usually required to have at least -50dB return loss or higher,

APC connector return loss should be -60dB or higher.

The most common connection now is the PC connector. Physical Contact connectors are just that—the end faces and fibers of two cables actually touch each other when mated.

PC and UPC connectors have reliable, low insertion losses. But their back reflection depends on the surface finish of the fiber. The finer the fiber grain structure, the lower the back reflection. And when PC and UPC connectors are continually mated and remated, back reflection degrades at a rate of about 4 to 6 dB every 100 matings for a PC connector. APC connector back reflection does not degrade with repeated matings.



1m SC/APC To SC/UPC Simplex 9/125 Singlemode Fiber Patch Cable Yellow

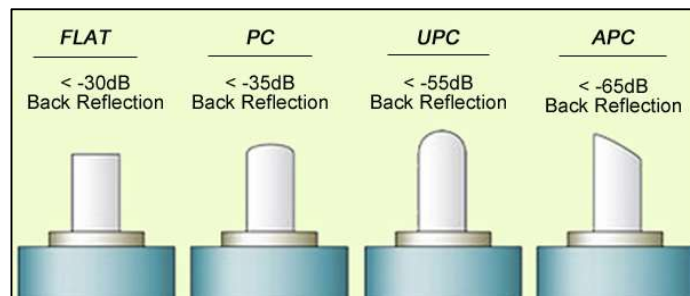
\$19.25

SKU: 43121

We offer a big selection of singlemode simplex cables in a variety of connector configurations including UPC (Ultra Physical Contact) and APC (Angle Physical Contact). Choose the product to meet your project needs.

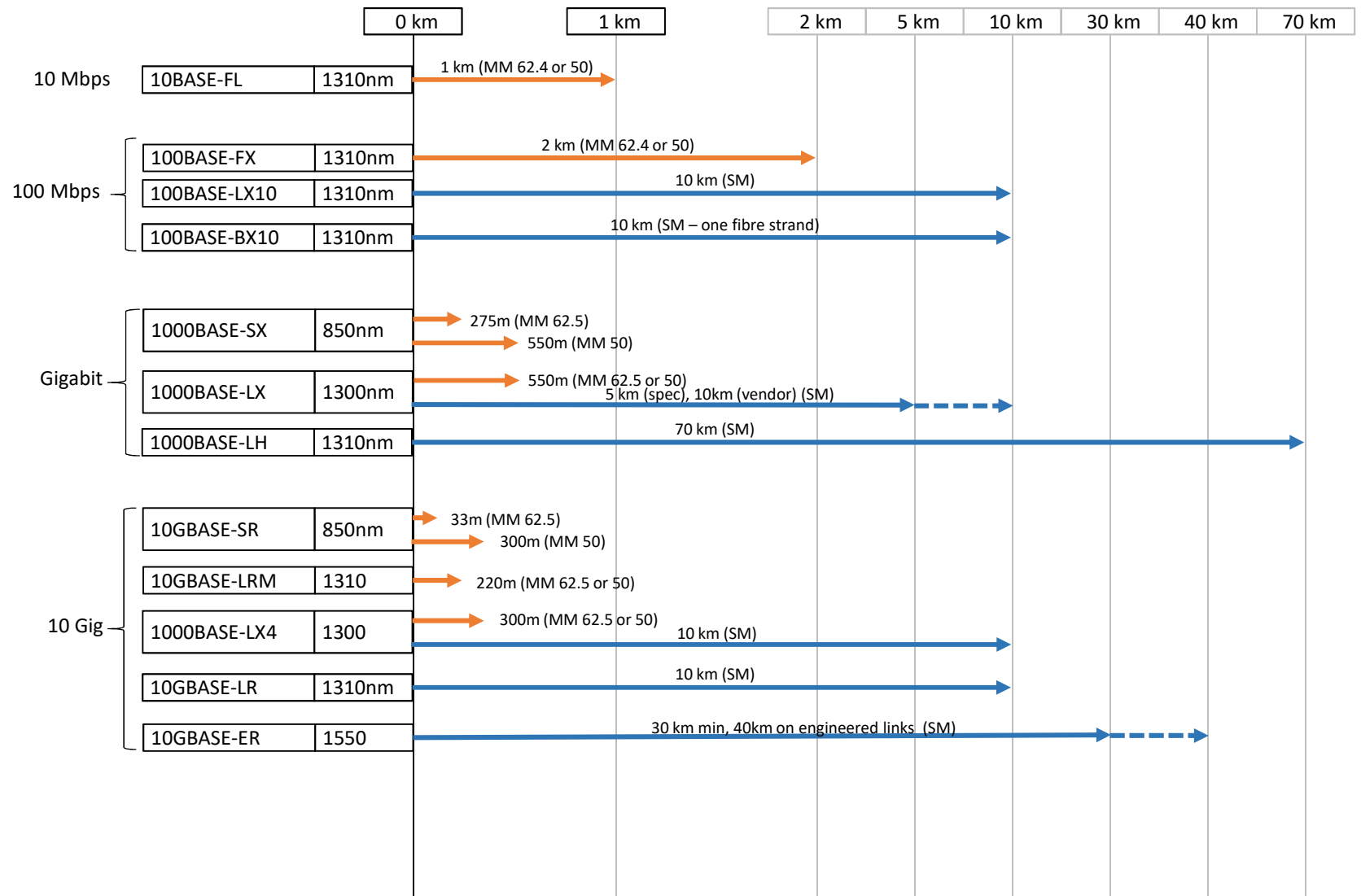
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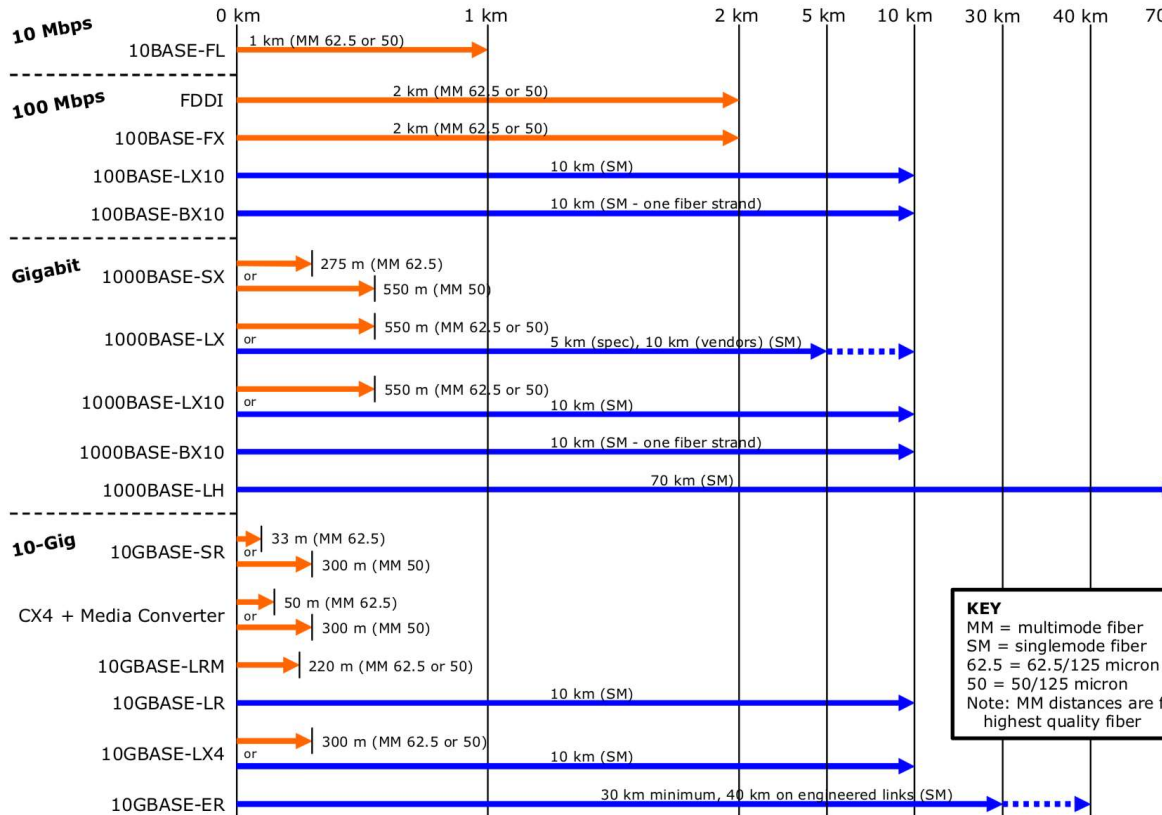
Connector Polish	Nominal Reflectance (dB)	Nominal Reflectance (%)
FLAT	-20 dB	1%
PC	-40 dB	0.01%
UPC	-50 dB	0.001%
APC	-60 dB or higher	0.0001%

The flat fiber connector is not suitable for single-mode fiber cables with a 9µm core size, thus it is essential to evolve into Physical Contact (PC) connectors.



Distances Supported on Fiberoptic Cabling for Different Technologies.

Fiberoptic distance vs technology



KEY
 MM = multimode fiber
 SM = singlemode fiber
 62.5 = 62.5/125 micron
 50 = 50/125 micron
 Note: MM distances are for highest quality fiber

Ethernet Name	Cable Type	Max Speed	Max Distance	Notes
10BASE-T	UTP	10 Mbps	100 m	One of the most
Fast Ethernet Standards				
100BASE-T	UTP/STP	100 Mbps	100 m	Two pairs of Cat
100BASE-FX	MMF	100 Mbps	2 km	100Mbps Ethern
Gigabit Ethernet (GbE) Standards				
1000BASE-T	UTP	1 Gbps	100 m	Four pairs of Cat
1000BASE-LX	MMF/SMF	1 Gbps	550 m/5 km	Uses 9µm or 10µ
1000BASE-SX	MMF	1 Gbps	550 m	Max length depe
10G Ethernet Standards				
10GBASE-T	UTP	10 Gbps	100 m	Connects to netw
10GBASE-SR	MMF	10 Gbps	300 m	850nm laser, ma
10GBASE-LR	SMF	10 Gbps	10 km	1310nm laser, m
10GBASE-ER	SMF	10 Gbps	40 km	1550nm laser, m
10GBASE-SW	MMF	10 Gbps	300 m	850nm laser tran
10GBASE-LW	SMF	10 Gbps	10 km	Typically used w
10GBASE-EW	SMF	10 Gbps	40 km	1550nm optical v