

Making light work of Fibre



[What is Fibre?](#)

Page 1

[Connector Types: SC/FC/LC](#)

Pages 2, 3

[Connection Types: UPC/APC/PC](#)

Page 4

[Connector Characteristics](#)

Page 5, 6

[Bend Radius](#)

Page 7

[Connector Range](#)

Pages 8, 9

[Attenuators](#)

Page 10

[Specifications](#)

Pages 11, 12

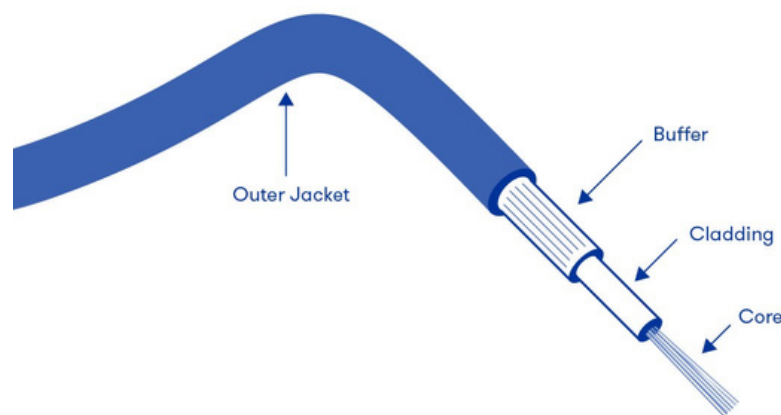
What is Fibre?

"Fibre optic" refers to the technology and transmission of light through thin, transparent fibres made of glass. They are designed to efficiently transmit light signals over long distances with minimal loss or degradation.

When light is injected into one end of a fibre optic cable, it undergoes multiple internal reflections due to the total internal reflection phenomenon, which helps maintain the signal's integrity. The light travels through the fibre by bouncing off the walls of the cable until it reaches the other end, where it is detected and converted back into electrical signals for further processing.

Fibre optics offer numerous advantages over traditional copper-based communication systems. They provide higher bandwidth, faster data transmission rates and better resistance to electromagnetic interference.

Fibre optic technology is widely used in telecommunications, internet connectivity, data centres, medical imaging, and various other applications that require efficient and reliable transmission of data.



Connector Types

SC, LC, FC

SC - Square/Subscriber Connector
Push on



LC Connectors (Little/Lucent)

The LC connector features a 1.25mm ceramic ferrule, which is smaller than the 2.5mm ferrule used in connectors like SC. This smaller size allows for higher-density connections, making it ideal for applications where space is limited. It utilises a push-pull mechanism, similar to the SC connector. It provides secure and easy connections with precise alignment of the fibre optic cables.

SC Connectors (Square/Subscriber)

An SC connector is a type of fibre optic connector commonly used in telecommunications and networking applications. This uses a push-pull connector that uses a snap-in mechanism for a quick and secure connection. The SC connector features a square-shaped outer housing and uses a ceramic ferrule to align and connect the fibre optic cables.

LC - Little/Lucent Connector
Push on RJ45 style



FC Connectors (Ferrule)

Ferrule connectors are a type of fibre connector that were initially developed for high-speed fibre channel networks but is also used in other applications that require robust and reliable fibre optic connections. The FC connector features a threaded coupling mechanism, where the connector is screwed onto the mating connector for a secure connection.

FC - Ferrule Connector
Screw on



Connector Types

Applications



LC Connectors Applications

Similar to SC connectors, LC connectors can be used in **telecommunications, data centres, LANs, FTTC** but can also be used for **high speed ethernet, test & measurement equipment, healthcare, aerospace and military applications.**



SC Connector Applications

SC connectors are widely used in **telecommunications, data centres, LANs, FTTH, CATV, and also have industrial, security and medical applications.** The versatility, reliability, and ease of use of SC connectors make them a popular choice in many industries that rely on fibre optic communications.



FC Connectors Applications

FC connectors are similar to the others with being applicable to telecommunications and data centres but are also used for more complex situations such as industrial utilisations, CATV & broadcasting, security systems, and harsher environments prone to extreme dust, moisture or other environmental factors.

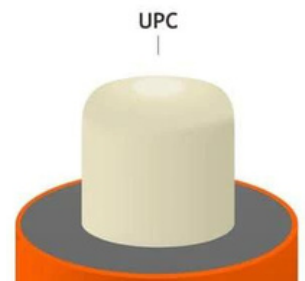
Connection Types

UPC, APC, PC

There are three types of connections: UPC, APC, and PC.

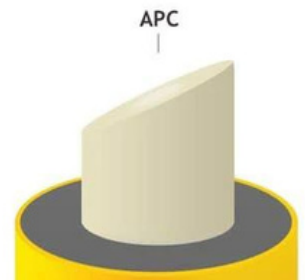
UPC - Ultra Physical Contact

In the context of fibre optics, UPC refers to a specific type of polish or finish applied to the end-face of the connector's ferrule. The UPC polish improves the optical performance by achieving a high level of contact between the fibre cores. Physically, these connectors have a slightly curved or dome-shaped end-face helping to create precise contact reducing signal loss through back-reflections. These are usually a blue connector.



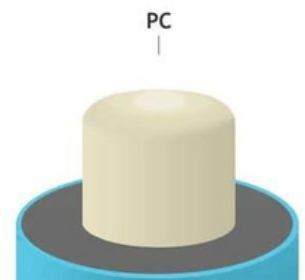
APC - Angled Physical Contact

APCs also have a specific polish or finish but are characterised by an angled slant on the end-face of the connector. The angled connectors help minimise back-reflections by directing reflected light at an angle into the cladding rather than back through the core of the fibre. This reduces the amount of reflected light that can interfere with the transmitted signal and results in lower return loss and improved signal quality. These are usually a green connector.



PC - Physical Contact

The PC polish is designed to ensure contact between fibre cores, providing a reliable and low loss connection. They are slightly curved, improving optical performance of the connection.





Connection Characteristics

Shutter & Flange

Flanges are mechanical components used for mounting and securing connectors. The flanges usually have a mounting hole on the connector. They act as a protective barrier around the connector whilst holding it in place, preventing from being dislodged.

Flange



Shutter



Shutters are protective covers that are used to shield the exposed end-face of a connector when it's not in use.

They're typically spring-loaded so open when the connector is inserted into an adaptor or port, and close when the connector is removed, providing immediate end-face protection.

Connection Characteristics

Simplex



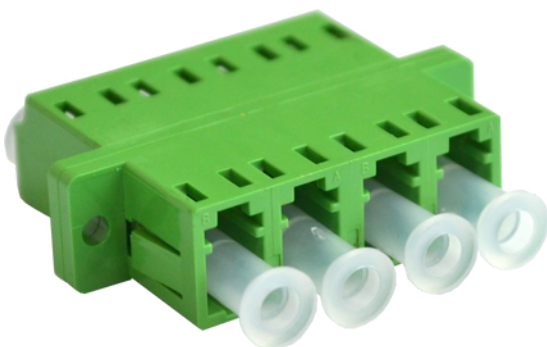
A simplex connector facilitates the connection of a single fibre cable. These can only be used for **one-way communication**.

A duplex connector enables the connection of two fibre connections, allowing bi-directional communication. A duplex connector houses two separate fibre connections in one.

Duplex



Quadplex



A quadplex fibre optic connector is designed to accommodate four individual fibre cables within a single connector body. It allows for the simultaneous connection and transmission of signals from four separate fibre connections, enabling efficient multi-channel communication in fibre optic systems.

Bend Radius

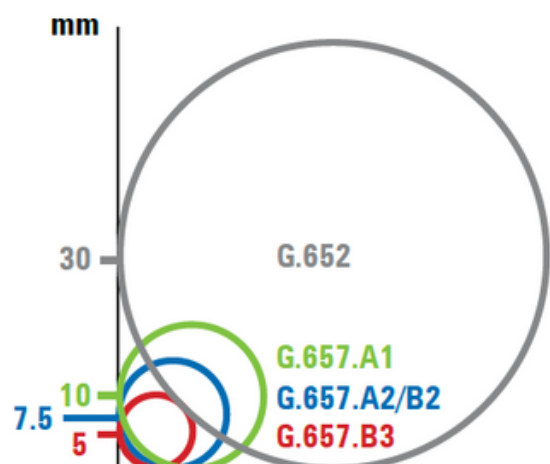
The bend radius of a fibre optic cable refers to the minimum radius at which the cable can be bent without causing excessive signal loss or damage to the fibre. It is a critical factor in designing and deploying fibre optic networks to ensure dependable signal transmission and the longevity of the cables.

G652D is one of the most commonly used single-mode optical fibres. It offers a good balance between cost, performance, and compatibility. G652D fibre has moderate bend resistance and is suitable for various applications, including long-haul and metropolitan networks.

G657A1 is a newer type of single-mode optical fibre designed to have improved bend performance compared to G652D. It has a smaller mode field diameter of around 8.6 micrometres, which makes it more resilient to bending-induced losses.

G657A2 is another variation of bend-resistant single-mode optical fibre. It offers even better bend performance compared to G657A1. G657A2 provides superior bending characteristics, making it suitable for extremely tight bend applications.

In essence, the main distinctions between these fibre types lie in their bend performance, which impacts their suitability for different network segments. G652D is a general-purpose fibre, while G657A1 and G657A2 are specifically designed to tolerate tighter bends, making them well-suited for access networks and specialized installations.



Connector Range

SC/APC Connectors

BFC-SCA-Q	Single Mode Fibre Optical Ferrule Field Assembly Connector Green Fast/Quick Connector
BFC-SCA-N	Single Mode Fibre Optical OS2 Simplex Adaptor/Coupler SC/APC Female to Female Green Without Flange and Transparent Cap (Suitable For BLPAT Range)
BFC-SCA-F	Single Mode Fibre Optical OS2 Simplex Adaptor/Coupler SC/APC Female to Female Green With Flange and Transparent Cap
BFC-SCA-FS	Single Mode Fibre Optical OS2 Simplex Adaptor/Coupler SC/APC Female to Female Green With Flange And Shutter
BFC-SCA-DX-F	Single Mode Fibre Optical OS2 Duplex Adaptor/Coupler SC/APC Female to Female Green With Flange and Transparent Cap



SC/UPC Connectors

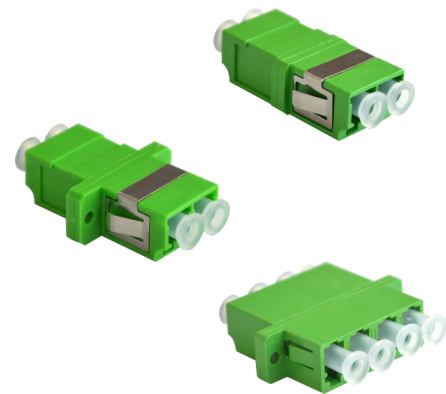
BFC-SCU-DX-F	Single Mode Fibre Optical OS2 Duplex Adaptor/Coupler SC/UPC Female to Female Blue With Flange and Transparent Cap
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Connector Range

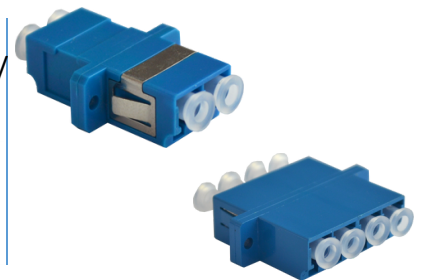
LC/APC Connectors

BFC-LCA-DX-N	Single Mode Fibre Optical OS2 Duplex Adaptor/Coupler LC/APC Female to Female Green Flangeless
BFC-LCA-DX-F	Single Mode Fibre Optical OS2 Duplex Adaptor/Coupler LC/APC Female to Female Green With Flange
BFC-LCA-QD-F	Single Mode Fibre Optical OS2 Quadplex Adaptor/Coupler LC/APC Female to Female Green With Flange



LC/UPC Connectors

BFC-LCU-DX-F	Single Mode Fibre Optical OS2 Duplex Adaptor/Coupler LC/UPC Female to Female Blue With Flange
BFC-LCU-QD-F	Single Mode Fibre Optical OS2 Quadplex Adaptor/Coupler LC/UPC Female to Female Blue With Flange



Adaptors

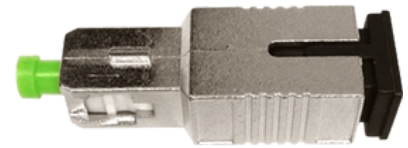
BFC-SCU-LCU	Metal Single Mode Fibre Optical OS2 SC to LC Adaptor with Flange (Suitable for BLFLRAK MPO Range)
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Attenuators

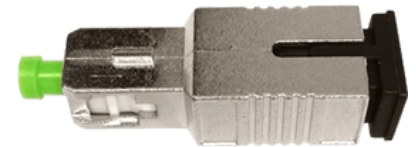
SC/APC Attenuators

An SC/APC fibre attenuator is a device that reduces the strength of optical signals in a fibre-optic communication system. It achieves this by introducing controlled signal loss. The SC/APC connector type is commonly used due to its precise alignment and low signal reflection properties. Attenuators find application in networks where signal levels need to be balanced, such as in telecommunications, data centres, and broadcasting.



Fibre Attenuator SC/APC 5dB

[BFATT-SCA-5DB](#)



Fibre Attenuator SC/APC 10dB

[BFATT-SCA-10DB](#)

FC/UPC Attenuators

An FC/UPC fibre attenuator lessens the strength of light signals in optical fibre systems. It aids in adjusting signal power levels, preventing excessive signal strength that can disrupt equipment. This simple device helps optimise signal transmission, promoting effective communication in fibre optic networks.



Fibre Attenuator FC/UPC 5dB

[BFATT-FCU-5DB](#)



Fibre Attenuator FC/UPC 10dB

[BFATT-FCU-10DB](#)

Specifications

SC/APC Fibre Optic Leads	Length (m)	Connector A	Connector B	Thickness (µm)	Cable Grade
BFL-SCA-2A1-1	1	SC/APC	SC/APC	2000	G657A1
BFL-SCA-3A1-1	1	SC/APC	SC/APC	3000	G657A1
BFL-SCA-3A1-2	2	SC/APC	SC/APC	3000	G657A1
BFL-SCA-3A1-5	5	SC/APC	SC/APC	3000	G657A1
BFL-SCA-3A1-10	10	SC/APC	SC/APC	3000	G657A1
BFL-SCA-3A1-20	20	SC/APC	SC/APC	3000	G657A1
BFL-SCA-3A1-30	30	SC/APC	SC/APC	3000	G657A1
BFL-SCA-3A1-50	50	SC/APC	SC/APC	3000	G657A1
BFL-SCA-3A1-75	75	SC/APC	SC/APC	3000	G657A1
BFL-SCA-3A1-100	100	SC/APC	SC/APC	3000	G657A1
BFL-SCA-3D-2	2	SC/APC	SC/APC	3000	G652D



SC/APC Fibre Optics Leads

SC/UPC Fibre Optic Leads	Length (m)	Connector A	Connector B	Thickness (µm)	Cable Grade
BFL-SCU-2D-05	0.5	SC/UPC	SC/UPC	2000	G652D
BFL-SCU-3D-05	0.5	SC/UPC	SC/UPC	3000	G652D
BFL-SCU-3D-1	1	SC/UPC	SC/UPC	3000	G652D
BFL-SCU-3D-1_5	1.5	SC/UPC	SC/UPC	3000	G652D
BFL-SCU-3D-2	2	SC/UPC	SC/UPC	3000	G652D
BFL-SCU-3D-3	3	SC/UPC	SC/UPC	3000	G652D
BFL-SCU-3D-4	4	SC/UPC	SC/UPC	3000	G652D
BFL-SCU-3D-5	5	SC/UPC	SC/UPC	3000	G652D



SC/UPC Fibre Optics Leads

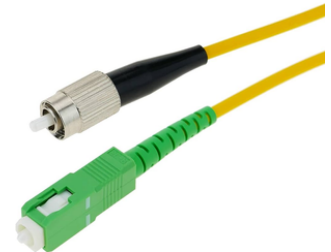
LC/UPC Fibre Optic Leads	Length (m)	Connector A	Connector B	Thickness (µm)	Cable Grade
BFL-LCU-3D-1	1	LC/UPC	LC/UPC	3000	G652D
BFL-LCU-3D-2	2	LC/UPC	LC/UPC	3000	G652D



LC/UPC Fibre Optics Leads

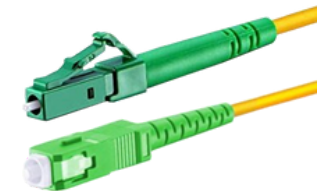
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FC/UPC to SC/APC Fibre Optical Leads	Length (m)	Connector A	Connector B	Thickness (µm)	Cable Grade
BFL-FCU-SCA-2A1-1	1	FC/UPC	SC/APC	2000	G657A1
BFL-FCU-SCA-3A2-1	1	FC/UPC	SC/APC	3000	G657A2
BFL-FCU-SCA-3D-1	1	FC/UPC	SC/APC	3000	G652D



FC/UPC to SC/APC Fibre Optics Leads

LC/APC to SC/APC Fibre Optical Lead	Length (m)	Connector A	Connector B	Thickness (µm)	Cable Grade
BFL-LCA-SCA-2A1-05	0.5	LC/APC	SC/APC	2000	G657A1



LC/APC to SC/APC Fibre Optics Leads

LC/APC Duplexed Fibre Optical Lead	Length (m)	Connector A	Connector B	Thickness (µm)	Cable Grade
BFL-LCA-DX-2A1-3	3	LC/APC Duplexed	LC/APC Duplexed	2000	G657A1



LC/APC Duplexed Fibre Optics Leads

Pigtails	Length (m)	Connector	Thickness (µm)	Cable Grade
BFP-FCU-9A1-1	1	FC/UPC	900	G657A1
BFP-LCA-9A1-1X12	1m x 12	LC/APC	900	G657A1
BFP-LCA-9A1-2X12	2m x 12	LC/APC	900	G657A1
BFP-LCA-9A2-2X12	2m x 12	LC/APC	900	G657A2
BFP-SCA-9A1-2X12	2m x 12	SC/APC	900	G657A1
BFP-SCA-9A1-05	0.5	SC/APC	900	G657A1
BFP-SCA-9A1-1	1	SC/APC	900	G657A1
BFP-LCU-9A1-1	1	LC/UPC	900	G657A1