# BLACK B⬦X

# EXTEND THE REACH OF YOUR NETWORK

Media Converters: Your Key to Cost-Effective Network Integration

## Increase Your Network's Speed, Distance, Capacity, and Security With Media Converters

Increasing speed, distance and bandwidth requirements driven by innovations in technology have made extending LANs over fiber cable essential for many industries. While the advantages of using fiber cable are significant and many, replacing an entire network system with fiber is cost prohibitive for most. Fortunately, media converters provide an affordable way to continue using existing infrastructure and equipment while gaining the benefits of fiber cable.

Whether you're running a call center, a manufacturing plant or a financial hub, Black Box has media converters designed to expand the capabilities of your network and provide an efficient transition to the latest technologies.

## Features

**Standalone or Chassis-Based**
Standalone media converters are deployed to convert one copper connection to fiber, whereas chassis-based media converters can be installed in high-density locations such as data centres.

**SFP Ports**
Enables you to use a small form-factor pluggable transceiver (SFP), either multimode or single-mode, so a media converter an be used in several different range locations.

**Autosensing Ports**
Allows media converters to automatically recognise the local network's speed and adjust its own setting accordingly.

**Auto MDI/MDI-X**
Allows media converters to automatically recognise the cable wiring type and adjust its own setting accordingly. PoE/PoE+ Support Power compatible PoE or PoE+ devices like access points, cameras and VoIP phones via copper wiring.

## Benefits

**Extend LAN Distances With Fiber**
Break the 100-meter distance limit of CATx cable and utilise fibre links to reach distances of up to 80 km.

**Maintain Investments in Existing Equipment**
Migrate a local network to fibre while protecting your investment in existing copper-based hardware and maintaining the existing infrastructure.

**Protect Data from Interference**
Electromagnetic interference, or EMI, can cause corruption of data over copper-based Ethernet links. Data transmitted overfibre-optic cable, however, is completely immune to this type of noise, ensuring optimal data transmission.

**Speed Conversion**
Convert link speeds from 10 Mbps to 100 Mbps or from 100 Mbps to 1000 Mbps.

**Secure Data Transmission**
Media converters feature high MTBF (Mean Time Between Failures) and enterprise class reliability.

# Selecting the Right Media Converter

Black Box offers the largest selection of commercial-grade and industrial media converters on the market. Below are key characteristics to consider when determining what media converter to choose for your application.

You can also use our Media Converter Selector online to determine the right product for your needs. Visit: BlackBox.com/MediaConverterSelector

## Selection Guide | Media Converters and SFP Modules

| | SERIES NAME | DESCRIPTION | SERIES | PAGE |
|---|---|---|---|---|
| | Pure Networking | Our new, low-cost media converters provide all the functionality you need to integrate fiber and new technology into your network without breaking the bank. | LHC210 Series LGC210 Series | 3 |
| | Micro Mini | Ultra-compact media converters for the tightest spaces. | LMC400 Series LMC4000 Series | 4 |
| | MultiPower Miniature | Enables you to use an SFP, either multimode or single-mode, to link the media converter to many kinds of fiber cable. | LHC000A Series LGC100A Series | 4 |
| | Industrial MultiPower | Ultra-compact, plug-and-play converters that offer multiple power options and are designed for use in harsh, industrial environments. | LIC020 Series LGC320 Series | 4 |
| | PoE/PoE+ Gigabit Ethernet | Power remote PoE/PoE+ devices such as security cameras, wireless access points and more. | LGC5200 Series | 5 |
| | PoE/PoE+ Industrial Gigabit Ethernet | Withstand extreme temperatures and power remote PoE/PoE+ devices such as security cameras, wireless access points and more. | LGC5300 Series | 5 |
| | FlexPoint Modular | These versatile, standalone converters can be upgraded to a chassis-based system, making it ideal for networks that are subject to constant upgrades. | LMC1017A Series LMC213A | 6 |
| | SFP Module | Adapt an SFP slot to a fiber or copper interface and increase network switch speed with these SFPs. | LFP400 Series LFP410 Series LSP420 Series | 6 |

## Pure Networking Series
### Cost-effective Media Converters

- Simple plug-and-play installation
- Diagnostic LEDs for troubleshooting
- Use as standalone or rackmount with the optional 14-slot chassis
- Seamless copper to fiber conversion for Fast Ethernet, Gigabit and even 10 Gigabit speeds
- Support for PoE+ to power devices like IP cameras and Wi-Fi access points

LHGC-RACK

| PRODUCT CODE | STANDALONE/ CHASSIS | SPEED | MEDIA/CONNECTOR | DISTANCE |
|---|---|---|---|---|
| LHC210A | Both | 10/100 Mbps Copper to 100 Mbps Fiber | Copper: RJ45, SFP Technology Fiber: SFP | SFP Dependent |
| LHC211A | Both | 10/100 Mbps Copper to 100 Mbps Fiber | Copper: RJ45, Multimode 1310nm Fiber: SC | 1.2mi (2km) |
| LHC212A | Both | 10/100 Mbps Copper to 100 Mbps Fiber | Copper: RJ45, Single-Mode 1310nm Fiber: SC | 6.2mi (10km) |
| LGC210A | Both | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, SFP Technology Fiber: SFP | SFP Dependent |
| LGC211A | Both | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, Multimode 850nm Fiber: SC | 0.3mi (0.55km) |
| LGC212A | Both | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, Single-Mode 1310nm Fiber: SC | 12.4mi (20km) |
| LGC215A | Standalone | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, SFP Technology Fiber: SFP slot, PoE+ | SFP Dependent |
| LGC220A | Standalone | 10 Gbps Copper to 10 Gbps Fiber | Copper: RJ45, SFP Technology Fiber: SFP | SFP Dependent |
| LHGC-RACK | Chassis | n/a | 14-Slot with Single or Dual AC or DC Power | n/a |

# Media Converters

## Micro Mini Series
### Mini Media Converters for the tightest spaces extend fiber up to 18mi/30km

- Bring fiber to the desktop easily and cost-effectively
- Ultra lightweight - only 2.5 ounces
- Supports distances of up to 3.1mi/5km over multimode fiber or 18mi/30km over single-mode fiber
- Power through USB or the included power adapter
- Models with SFP ports for 100 Mbps or 1000 Mbps Ethernet

LMC4000 SERIES

| PRODUCT CODE | STANDALONE/ CHASSIS | SPEED | MEDIA/CONNECTOR | DISTANCE |
|---|---|---|---|---|
| LMC400A | Standalone | 10/100/1000 Mbps Copper to 100 Mbps Fiber | Copper: RJ45, SFP Technology Fiber: SFP | SFP Dependent |
| LMC401A | Standalone | 10/100/1000 Mbps Copper to 100 Mbps Fiber | Copper: RJ45, Multimode 1310nm Fiber: ST | 3.1mi (5km) |
| LMC402A | Standalone | 10/100/1000 Mbps Copper to 100 Mbps Fiber | Copper: RJ45, MultiMode, 1310nm Fiber: SC | 3.1mi (5km) |
| LMC4000A | Standalone | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, SFP Technology Fiber: SFP | SFP Dependent |
| LMC4001A | Standalone | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, Multimode 850nm Fiber: ST | 0.3mi (0.5km) |
| LMC4002A | Standalone | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, Multimode 1310nm Fiber: SC | 0.3mi (0.5km) |

## Multipower Miniature Series
### Bring fiber to the desktop with these space saving media converters

- Connect Ethernet, Fast Ethernet or Gigabit Ethernet copper ports to fiber-optic cable
- Compact size — 0.8"H x 1.8"W x 3.4"D
- Available in fiber-optic duplex and single-strand fiber versions
- 10/100/1000 versions auto negotiate for speed and duplex
- Use as standalone media converters or rackmount in the optional media converter rackmount chassis
- Powered by its universal AC power supply, a PC's USB port (LHC000 series only) or the optional media converter rackmount chassis

LHC015A-R3

| PRODUCT CODE | STANDALONE/ CHASSIS | SPEED | MEDIA/CONNECTOR | DISTANCE |
|---|---|---|---|---|
| LHC013A-R3 | Both | 10/100 Mbps Copper to 100 Mbps Fiber | Copper: RJ45, Multimode 1300nm Fiber: ST | 1.2mi (2km) |
| LHC015A-R3 | Both | 10/100 Mbps Copper to 100 Mbps Fiber | Copper: RJ45, Single-Mode 1310nm Fiber: SC | 24.9mi (40km) |
| LGC120A-R2 | Both | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, Multimode 850nm Fiber: SC | 0.1mi (0.22km) |
| LGC121A-R2 | Both | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, Single-Mode 1310nm Fiber: SC | 6.2mi (10km) |
| LHC018A-AC-R2 | Chassis | n/a | 18-Slot with AC Power | n/a |

## Industrial Multipower Series
### Ultra compact, plug-and-play converters designed to withstand harsh temperatures

- Work as standalone devices or hot-swappable, chassis-based media converters
- Easy installation — no software required
- The rackmount chassis holds up to 18 media converters and features single AC power and fits into a standard 19" rack

LGC320A-R2

| PRODUCT CODE | STANDALONE/ CHASSIS | SPEED | MEDIA/CONNECTOR | DISTANCE |
|---|---|---|---|---|
| LIC022A-R2 | Both | 10/100 Mbps Copper to 100 Mbps Fiber | Copper: RJ45, Multimode 1300nm Fiber: ST, PoE PD | 1.2mi (2km) |
| LIC023A-R2 | Both | 10/100 Mbps Copper to 100 Mbps Fiber | Copper: RJ45, Multimode 1300nm Fiber: SC, PoE PD | 1.2mi (2km) |
| LIC024A-R2 | Both | 10/100 Mbps Copper to 100 Mbps Fiber | Copper: RJ45, Single-Mode 1310nm Fiber: ST, PoE, PD | 24.9mi (40km) |
| LIC025A-R2 | Both | 10/100 Mbps Copper to 100 Mbps Fiber | Copper: RJ45, Single-Mode 1310nm Fiber: SC, PoE, PD | 24.9mi (40km) |
| LGC320A-R2 | Both | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, Multimode 850nm Fiber: SC | 0.2mi (0.3km) |
| LGC321A-R2 | Both | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, Single-Mode 1310nm Fiber: SC | 9.3mi (15km) |
| LHC018A-AC-R2 | Chassis | n/a | 18-Slot with Single AC Power | n/a |

# What is PoE and How Does It Work?

One significant advantage offered by twisted-pair Ethernet cable is providing electrical power to low-wattage electrical devices with Power over Ethernet (PoE).

PoE works by having power sent over Ethernet via CAT5 or higher copper cable to PoE-enabled devices. With four wire pairs available, two scenarios are possible:

1. Two of the four wire pairs can be used to transmit data while the other two pairs provide power.
2. All four wire pairs can be used to transmit both data and power without incurring any interference because the PoE current carried by the wires is a direct current, while the data signal carried within the pair is very high frequency. The two currents can be separated at either end by an electric transformer.

## PoE/PoE+ Media Converters

- PoE PSE media converters deliver power to PoE-powered PD devices such as Wi-Fi access points, IP cameras and access control systems. PoE PSE media converters get their power from the copper CATx cable, eliminating the need for a local AC power circuit.
- Compact PoE PSE media converters only require one electrical outlet to power both the converter and a PoE device from the nearest power outlet. They can be an essential source for PoE access points, IP cameras and entry control systems.
- Compact PoE PSE media converters provide a copper-to-fiber bridge for long-distance Ethernet fiber-optic segments without the need for a local power supply.
- PoE+ media converters extend your network and power more demanding devices such as video conferencing equipment, PTZ cameras and 802.11n wireless access points.

## POE/POE+ Gigabit Ethernet Series
### Connect with fiber and provide power to remote PoE devices

- Feature two 10/100/1000 Mbps copper ports with 1000 Mbps fiber speed
- Models with SFP ports can be customized to the data rate and distance of your choice through the use of standard SFPs
- Act as power sourcing equipment (PSE) on the copper side to power PoE devices
- Power options include AC power supply, DC power jack and DC terminal block
- Feature an extended temperature range (0° to 70° C) when used with DC terminal-block power
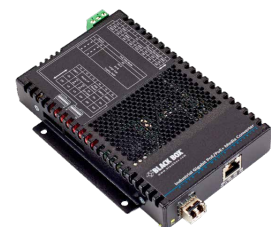
LGC5210A

| PRODUCT CODE | STANDALONE/ CHASSIS | SPEED | MEDIA/CONNECTOR | DISTANCE |
|---|---|---|---|---|
| LGC5200A | Standalone | 10/100/1000 Mbps Copper to 100/1000 Mbps Fiber | Copper: RJ45, SFP Technology Fiber: SFP, PoE | SFP Dependent |
| LGC5201A | Standalone | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, Multimode 850nm Fiber: SC, PoE | 0.3mi (0.55km) |
| LGC5202A | Standalone | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, Single-Mode 1310nm Fiber: SC, PoE | 9.3mi (15km) |
| LGC5210A | Standalone | 10/100/1000 Mbps Copper to 100/1000 Mbps Fiber | Copper: RJ45, SFP Technology Fiber: SFP, PoE+ | SFP Dependent |
| LGC5211A | Standalone | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, Multimode 850nm Fiber: SC, PoE+ | 0.3mi (0.55km) |
| LGC5212A | Standalone | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, Single-Mode 1310nm Fiber: SC, PoE+ | 9.3mi (15km) |

## POE/POE+ Industrial Gigabit Ethernet Series
### Use this tough media converter to connect with fiber and power remote PoE devices

- Withstand extreme temperatures of -40° to +65° or +75° C (depending on model)
- Converts 10/100/1000BASE-T copper to 1000BASE-X fiber
- Supports IEEE 802.3af PoE standards
- Models with SFP ports can be customized to the interface of your choice
- UTP ports are autosensing with Auto MDI/MDI-X
- DC terminal block power input (46-57 VDC); optional DIN rail power supplies (MDR-40-48, SDR-120-48)
- Compatible with legacy pre-IEEE standard powered devices

LGC5310A

| PRODUCT CODE | STANDALONE/ CHASSIS | SPEED | MEDIA/CONNECTOR | DISTANCE |
|---|---|---|---|---|
| LGC5300A | Standalone | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, SFP Technology Fiber: SFP, PoE | SFP Dependent |
| LGC5301A | Standalone | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, Multimode 850nm Fiber: SC, PoE | 0.3mi (0.55km) |
| LGC5310A | Standalone | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, SFP Technology Fiber: SFP, PoE+ | SFP Dependent |
| LGC5311A | Standalone | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, Multimode 850nm Fiber: SC, PoE+ | 0.3mi (0.55km) |

# Media Converters

## Flexpoint Modular Series
### Small media converters that extend LAN reach
- Work as standalone conversion devices or hot-swappable, chassis-based media converters
- Easy installation — no software required
- The FlexPoint Power Chassis holds up to 14 media converters and features single or dual hot-swappable AC or DC power supplies
- The chassis fits into a standard 19" rack

LMC200

| PRODUCT CODE | STANDALONE/CHASSIS | SPEED | MEDIA/CONNECTOR | DISTANCE |
|---|---|---|---|---|
| LMC1017A-SFP | Both | 10/100/1000 Mbps Copper to 100/1000 Mbps Fiber | Copper: RJ45, SFP Technology Fiber: SFP | SFP Dependent |
| LMC1017A-SMST | Both | 10/100/1000 Mbps Copper to 1000 Mbps Fiber | Copper: RJ45, Single-Mode 1310nm Fiber: ST | 7.4mi (2km) |
| LMC213A-MMSC-R2 | Both | 100 Mbps Copper to 100 Mbps Fiber | Copper: RJ45, Multimode 1300nm Fiber: SC | 1.2mi (2km) |
| LMC200 | Chassis | n/a | 14-Slot with Single AC or DC Power | n/a |
| LMC200-2PS | Chassis | n/a | 14-Slot with Dual AC Power | n/a |

## SFP Module Transceivers
### Modular, flexible transceivers for data communications equipment
- Enable you to adapt an SFP slot to a fiber interface or copper interface
- Because they're transparent to data, this SFP series is compatible with any network standard operating at speeds of up to 10 Gbps

LFP414

| PRODUCT CODE | SPEED | MEDIA/CONNECTOR | DISTANCE |
|---|---|---|---|
| LFP401 | 155 Mbps | 850nm Multimode Fiber, LC, SFP | 1.2mi (2km) |
| LFP402 | 155 Mbps | 1310nm Multimode Fiber, LC, SFP | 1.2mi (2km) |
| LFP403 | 155 Mbps | 1310nm Single-Mode Fiber, LC, SFP | 18.6mi (30km) |
| LFP404 | 155 Mbps | 1310nm Single-Mode Fiber, LC, SFP | 37.3mi (60km) |
| LFP411 | 1250 Mbps | 850nm Multimode Fiber, LC, SFP | 0.3mi (0.55km) |
| LFP412 | 1250 Mbps | 1310nm Multimode Fiber, LC, SFP | 1.2mi (2km) |
| LFP413 | 1250 Mbps | 1310nm Single-Mode Fiber, LC, SFP | 6.2mi (10km) |
| LFP414 | 1250 Mbps | 1300nm Single-Mode Fiber, LC, SFP | 18.6mi (30km) |
| LFP415 | 1250 Mbps | 1000 Base-T Copper, SerDes Interface, RJ45, SFP | 328ft (100m) |
| LFP416 | 1250 Mbps | 10/100/1000 Base-T Copper, SGMII Interface, RJ45, SFP | 328ft (100m) |
| LFP418 | 1250 Mbps | 1550nm Single-Mode Fiber, LC, SFP | 49.7mi (80km) |
| LFP420 | 1250 Mbps | 1550nm TX, 1310nm RX Single-Mode Fiber, LC, SFP | 6.2mi (10km) |
| LFP421 | 1250 Mbps | 1550nm RX, 1310nm TX Multimode Fiber, LC, SFP | 6.2mi (10km) |
| LSP421 | 10 Gbps | 850nm Multimode Fiber, LC, SFP+ | 984ft (300m) |
| LSP422 | 10 Gbps | 1310nm Single-Mode Fiber, LC, SFP+ | 6.2mi (10km) |

# Media Converter Applications

There are many circumstances for which media converters can facilitate a necessary extension of the reach of an existing copper or fiber network. Whether it means increasing the bandwidth, speed, distance, or resistance to interference or hacking, or providing power to PoE-enabled devices, media converters provide a low cost way to maximize the potential of your network.
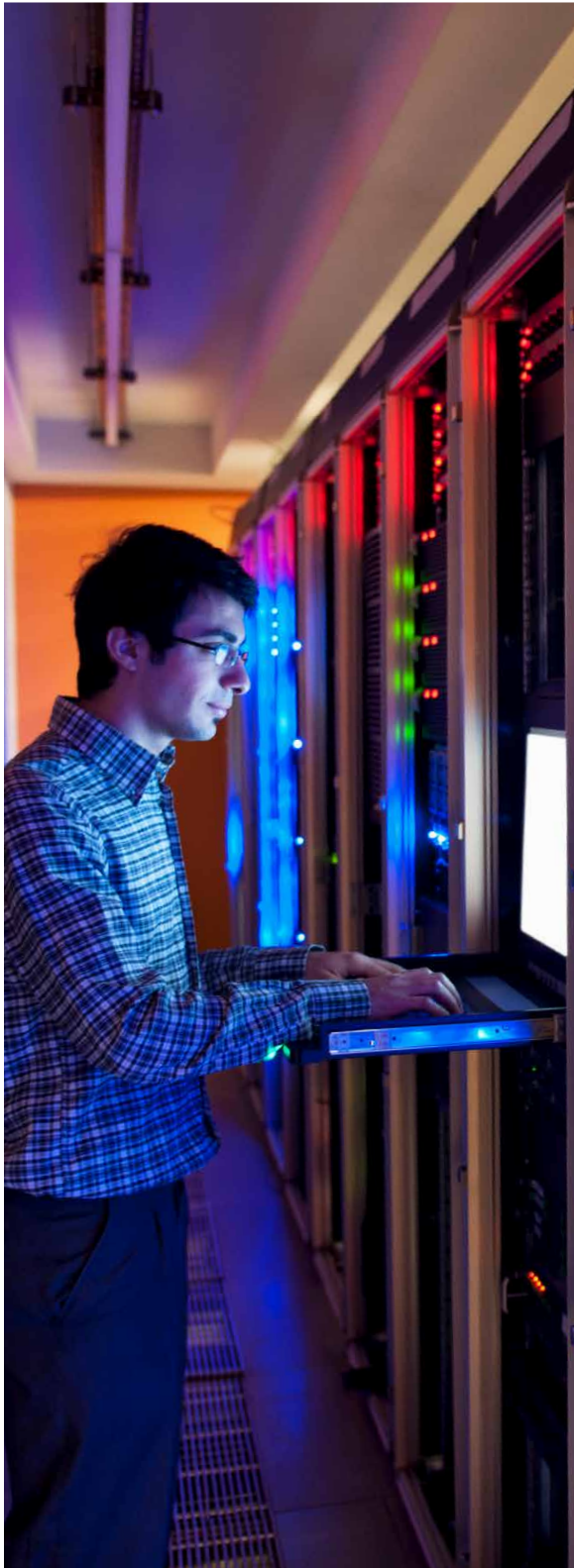
## Data Centers

In the data center, copper-to-fiber conversion extends the productive life of existing copper-based switches by providing a gradual migration path from copper to fiber. Chassis-based media converters mount in racks beside network switches, enabling conversion of copper ports on legacy switches to fiber. Media converters can also be used with new copper switches that have fixed RJ-45 ports, which are significantly less expensive than equivalent fiber switches.

## Fiber to the Desktop

Instead of incurring the expense of running fiber throughout your network and replacing cable, switches, patch panels, and network interface cards, media converters can provide the same advantages as a 100% fiber network while retaining existing network devices and copper ports at a significant cost savings. Media converters provide organizations with a cost-effective way to reap the benefits of 100Mbps and Gigabit speeds available with fiber and the PoE benefits of copper. A standalone media converter tucked behind a PC can connect a fiber cable to its RJ-45 Ethernet port. Unlike a fiber NIC, media converters do not take up a slot on the PC nor do they cause conflicts because they are transparent to the Operating System (OS) – no drivers are required. Limited electrical access? No problem. Many media converters can be powered by a PC's USB port.

## Security and Surveillance

PoE simplifies installation of IP security cameras by eliminating the need for a power circuit near the installed device. PoE media converters power these devices and backhaul signals to remote data centers or operations centers.

## Industrial Safety and Automation

Manufacturing and other industrial environments that employ automation technology require network devices that can operate reliably under harsh conditions. In many cases, this equipment may be exposed to extreme temperatures, vibrations, chemical exposure and electromagnetic interference. Industrial media converters are one of many industrial grade devices that can be employed to separate essential equipment from harsh conditions and ensure that the integrity of the network infrastructure remains intact.

## Bridging LANs over Fiber

When expanding the reach of the LAN to multiple locations, media converters provide LAN extensions that form one large network that spans a limited geographic area. Because most premises networks are copper-based with a limit of 328 feet (100 meters), media converters can extend the reach of the LAN over single-mode fiber up to 80mi (130km) with 1550nm wavelength optics.
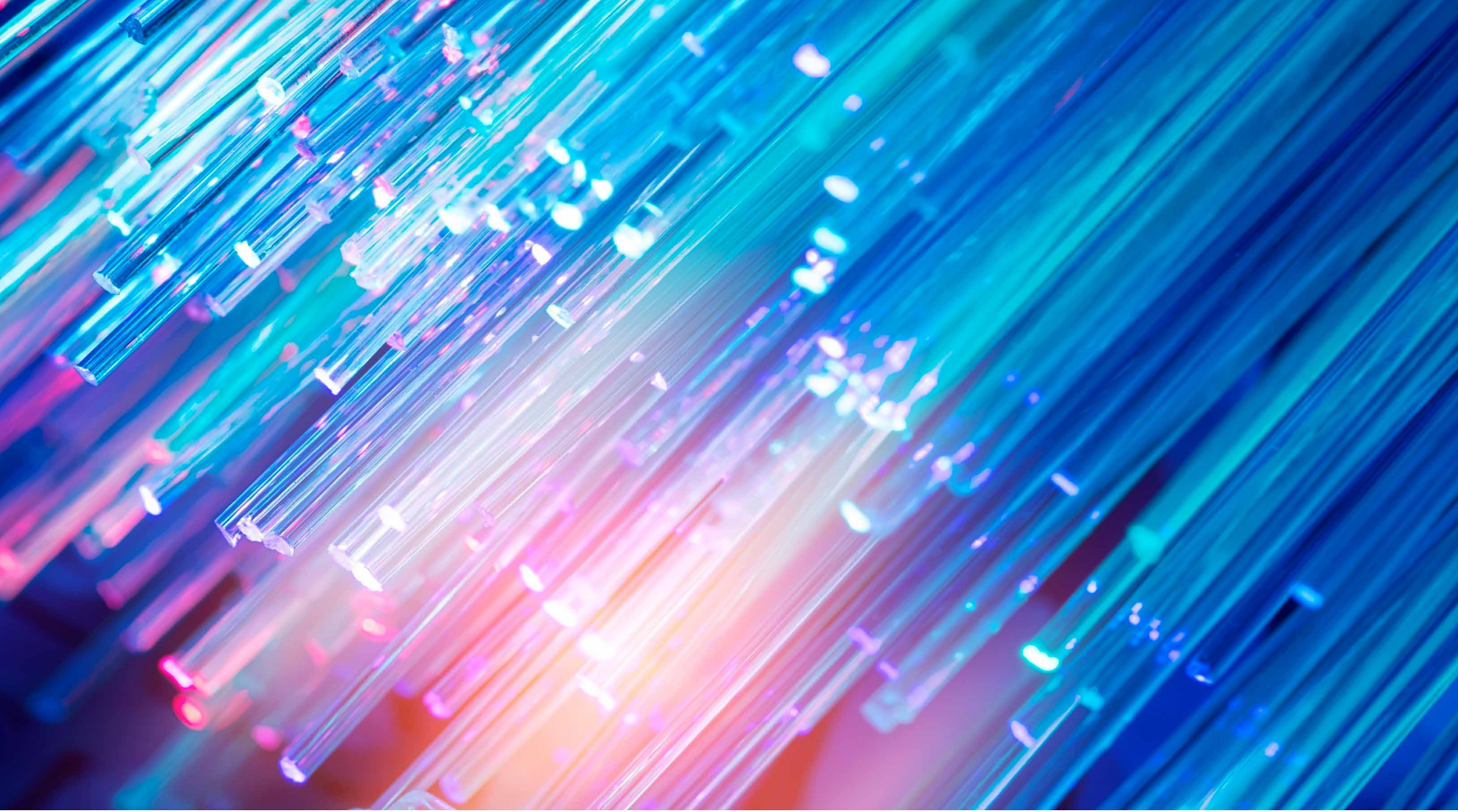
# WHY BLACK BOX?

### EXPERTISE
Black Box project engineers can assist with system assessment, design, deployment and training.

### SUPPORT
Reflecting our commitment to complete satisfaction, our dedicated team of highly trained support technicians is available by phone free of charge, every day of the year.

### WARRANTIES
Multi-year warranties with multi-year extensions and replacement options are available.

### EXPERIENCE
Providing leading technology solutions since 1976, Black Box helps more than 175,000 customers in 150 countries build, manage, optimize and secure IT infrastructures.

### CENTER OF EXCELLENCE
Black Box offers a Center of Excellence featuring professional services and support agreements that help optimize customers' systems and maximize uptime.

### SERVICE LEVEL AGREEMENTS
Our service level agreements give customers access to technical support, product training, dedicated application engineers and more.

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