

# Power over Ethernet (PoE) Solutions

Put technology wherever you need it — without running power



Power over Ethernet (PoE) delivers data and electrical power to PoE-enabled devices using CATx network cables. It also simplifies device installation and significantly reduces wiring, tubing and labor costs. Black Box has a wide range of PoE products to ensure you can take advantage of this technology in your application. We offer PoE Ethernet switches, splitters, repeaters/extenders, media converters, injectors and more.

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Corporate



Industry &  
Manufacturing



Utilities



Healthcare



Retail

### **Ideal for a Wide Range of Industries**

Power over Ethernet provides data and power simultaneously over CATx cable, connects devices in hard-to-reach areas and can work during a power failure. This makes it ideal for a multitude of industries, including corporate, industrial and manufacturing, oil and gas, healthcare and more.



# Power over Ethernet Explained

## What is PoE?

Power over Ethernet is a technology that provides both data and power over a standard twisted-pair cable in an Ethernet network. PoE is commonly used to power low-wattage network devices, such as IP surveillance cameras, wireless access points and VoIP phones, in hard-to-reach locations where there are no electrical outlets.

## How Does PoE Work?

Ethernet cable that meets CATx standards consists of four twisted pairs of cable. Power over Ethernet sends power over these pairs to PoE-enabled devices. First PoE standards use two twisted pairs to transmit data, while the remaining two pairs are used for power transmission. The new PoE standards send power and data over all four twisted pairs.

When the same pairs are used for both power and data, the power and data transmissions don't interfere with each other. That is because electricity and data are transported at opposite ends of the frequency spectrum. Electricity has a low frequency of 60 Hz or less, and data transmissions have frequencies that can range from 10 million to 100 million Hz.

## PoE Standards

PoE is defined in IEEE (Institute of Electrical and Electronics Engineers) standards. The IEEE802.3af PoE standard provides 15.4 watts of power per port. The IEEE 802.3at PoE standard, also known as PoE+, provides up to 30.0 watts of power to a PoE device. That's sufficient power for devices such as VoIP phones, wireless access points and security cameras, but it's not enough for flat screen displays, LED lighting or retail POS terminals.

To meet the demands of devices that require higher wattage, the PoE standard 802.3bt, also referred to as Ultra PoE or UPoE, was created. This standard supports two higher power types: up to 55 watts (Type 3) and up to 90 to 100 watts (Type 4). It also supports 2.5GBASE-T, 5GBASE-T and 10GBASE-T. This increase in power allows you to use PoE for a greater range of devices and applications.

## Benefits of PoE

### Simultaneous Delivery of Data and Power

The main benefit of PoE is the simultaneous delivery of both data and power over a standard CAT5e/6 cable. This means you no longer have to run multiple cables to your devices to provide them with power and network connectivity.

### Connect Devices in Hard-to-Reach Areas

Devices like security cameras are often installed in hard-to-reach areas (ceilings, building exteriors, etc.) that lack power outlets or access to a power supply. PoE allows you to connect and power these devices by simply plugging an Ethernet cable into their RJ-45 port.

### Cost-Effective

The infrastructure and cabling needed to power all of the different devices in today's applications can become expensive fast. Since PoE requires only one cable to transfer both data and power, it greatly reduces your wiring, tubing and labor costs.

### Installing Devices is Simple

With PoE, you are no longer constrained by the location of power outlets when installing devices. You can place your device anywhere you can run Ethernet cable. This reduces clutter in work areas and frees up power outlets for the devices that actually need them.

### Reliability

Any type of power loss can be detrimental to business operations and can cost you time and money. Most LANs are protected from electrical failures by an uninterruptible power supply (UPS), which means all of your PoE devices remain on and connected even when the main power goes down.





# PoE Applications



## Industry & Manufacturing

Powering network devices in industrial environments can be challenging. IP surveillance cameras, remote sensors and other PoE-enabled devices are being installed in possibly hard-to-reach places on factory floors. PoE technology simplifies the installation by enabling the use of one twisted pair cable without the need for additional power outlets. Industrial PoE switches and media converters are especially designed to withstand extreme conditions in harsh industrial environments.



## Corporate

The communication infrastructure challenges within today's corporate environments are becoming increasingly complex and dynamic. Due to the simple and cost-effective installation, PoE technology is very often used in corporate applications. The technology offers an easy expansion of Wi-Fi networks, and simple installation of IP surveillance cameras and VoIP systems. Automating all these processes reduces stress on IT departments, allowing them to focus on other concerns.



## Utilities

Network power availability has to be ensured at all times, even in the most remote or hazardous sites. PoE technology simplifies the installation in hard-to-reach areas and provides a reliable and cost-effective source of power over the same Ethernet network that is used for f.e. wireless access points or IP surveillance cameras. Industrial PoE switches and media converters are especially designed to withstand extreme conditions in harsh refinery environments.



## Healthcare

Older hospitals and the trend of digitising patient records have created a challenge for the IT department in hospitals with a growing demand for reliable connectivity through more powerful wireless networks. PoE technology provides reliable and secure wireless networks, allowing plug-and-play network upgrades, regardless of the location or placement of existing power sockets.



# PoE Ethernet Switches

## Unmanaged Gigabit Switches – PoE/PoE+

- Add up to (8) VoIP phones, security cameras, wireless access points and other PoE devices to an existing 10/100/1000 Ethernet network
- IEEE 802.3af or 802.3at compliant
- LPB1205A features (4) PoE ports and (1) uplink port; each PoE port provides 15.4 watts of power
- LPB1308A features (8) shielded PoE+ ports that provide 30.0 watts of power per port



LPB1205A

Product Code	Description
LPB1205A	(4+1) Gigabit UTP Ports, PoE
LPB1308A	(8) Gigabit UTP Ports, PoE+

## Managed Gigabit Switches – PoE/PoE+

- (8), (24) or (48) 10/100/1000BASE-T UTP ports
- All models have 2 or 4 dual-media UTP/SFP(+) ports
- High-speed managed switches provide up to 380 watts of power
- Power 802.3af PoE or 802.3at PoE+ devices through the data line
- Full SNMP and web-based management
- 802.3az Energy-Efficient Ethernet saves on power costs



LPB2926A

Product Code	Description
LPB2910A	(8) Gigabit UTP + (2) RJ45/SFP Ports, PoE+
LPB2926A	(24) Gigabit UTP + (2) RJ45/SFP Ports, PoE+
LPB2952A	(48) Gigabit UTP Ports + (4) SFP/SFP+ Slots, PoE+

See all Enterprise PoE Switches at [blackbox.com/sw\\_ent](http://blackbox.com/sw_ent) ▶

## Industrial Unmanaged Gigabit Switches – PoE+

- Includes (4) or (8) 10-/100-/1000-Mbps PoE+ ports
- All models (except LPH008-R2) feature (1) or (2) additional Gigabit RJ45 ports and/or SFP slots
- Ideal for security and surveillance, building automation, oil/gas facilities, military applications and factories
- IP30 industrial design with a temperature range of -40°C to 75°C and dual DC power inputs for redundancy
- DIN-rail mountable



LIE401A

Product Code	Description
LPH008A-R2	(8) Gigabit UTP Ports, PoE+
LPH3061A	(4) Fast Ethernet UTP Ports + (1) Gigabit UTP Port + (1) Gigabit SFP Slot, PoE+
LPH3100A	(8+2) Gigabit UTP Ports, PoE+
LIE401A	(4) Gigabit UTP Ports + (1) Gigabit SFP Slot, PoE+

## Industrial Managed Gigabit Switches – PoE+

- (6) or (8) 10-/100-/1000-Mbps RJ-45 ports and two or four multispeed 100-/1000-Mbps SFP slots
- SFP port enables single-mode or multimode Gigabit fiber uplinks over long distances
- Use in harsh applications
- IP30 industrial design with a temperature range of -40°C to 75°C and dual DC power inputs for redundancy
- Manage through a web interface (except LIE1014A), SNMP or command-line interface
- DIN-rail mountable



LIE1014A

Product Code	Description
LIE1080A	(8) Gigabit UTP Ports, PoE+
LIE1082A	(6) Gigabit UTP Ports + (2) Gigabit SFP Slots, PoE+
LIE1014A	(8) Gigabit UTP Ports + (4) Gigabit SFP Slots, PoE+

See all Industrial PoE Switches at [blackbox.com/sw\\_ind](http://blackbox.com/sw_ind) ▶

# PoE Media Converters

## Gigabit Media Converters – PoE/PoE+

- Convert 10-/100-/1000-Mbps copper to Gigabit Ethernet fiber
- Easily connect and power remote IP cameras and WiFi access points to your network
- PoE/PoE+ PSE models act as power sourcing equipment on the copper side to provide up to 30.0 watts of power



LGC215A

Product Code	Description
LGC215A	10-/100-/1000-Mbps Copper to 1000-Mbps Fiber, SFP, PoE+
LPS500A-MM-LC	10-/100-/1000-Mbps Copper to 1000-Mbps Fiber, Multimode 850nm, LC, PoE PSE
LPS535A-SFP	10-/100-/1000-Mbps Copper to 1000-Mbps Fiber, SFP, PoE+ PSE

See all Enterprise PoE Media Converters at [blackbox.com/mc\\_ent](https://blackbox.com/mc_ent) ▶

## Industrial Gigabit Media Converters - PoE+/UPoE

- Convert 10-/100-/1000-Mbps copper to Gigabit Ethernet fiber
- IP30 industrial design with a temperature range of -40°C to 75°C
- LGC5500A is fully compliant with IEEE802.3at (PoE+) standard
- LGC5400A supports Cisco Ultra PoE and delivers up to 60.0 watts of power
- DIN-rail mountable

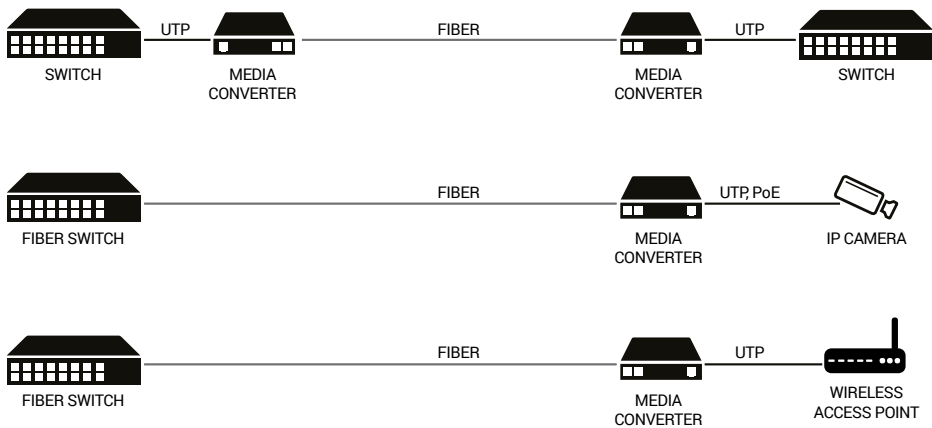


LGC5400A

Product Code	Description
LGC5400A	10-/100-/1000-Mbps Copper to 1000-Mbps Fiber, SFP, UPoE
LGC5500A	10-/100-/1000-Mbps Copper to 100-/1000-Mbps Fiber, SFP, PoE+

See all Industrial PoE Media Converters at [blackbox.com/mc\\_ind](https://blackbox.com/mc_ind) ▶

### Typical Applications



# PoE Injectors

## Gigabit Injectors - PoE/PoE+

- Reliable midspan injectors, 802.3af (LPJ000A-F-R2) or 802.3at (LPJ00xA-T-R2) compatible for powered devices
- All models provide 33.0 watts of safe power to each device (except LPJ000A-F-R2, 19.6 watts)
- Support Gigabit Ethernet data connections
- Ideal for IP phones, security cameras, wireless network access points, Bluetooth® access points and other 802.3af/at-compatible equipment.
- Simple plug-and-play installation
- LPJ00xA-T-R2 models provide overtemperature, overvoltage and overcurrent protection
- Avoid the cost and hassle of installing AC power at remote powered devices



LPJ000A-F-R2

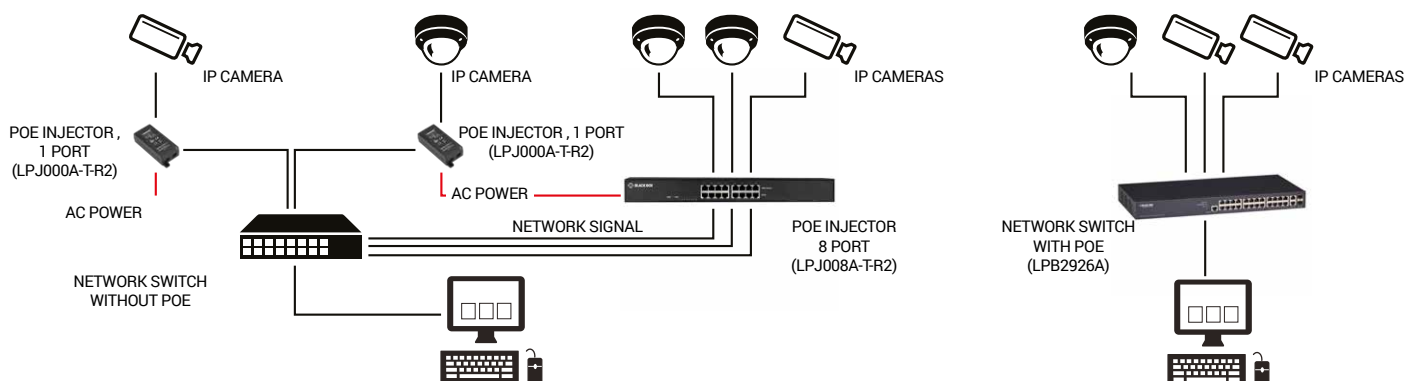


LPJ008A-T-R2

Product Code	Description
LPJ000A-F-R2	1 Port, Gigabit In/Out, PoE, Desktop
LPJ001A-T-R2	1 Port, Gigabit In/Out, PoE+, Desktop
LPJ008A-T-R2	8 Ports, Gigabit In/Out, PoE+, Rackmount
LPJ016A-T-R2	16 Ports, Gigabit In/Out, PoE+, Rackmount

See all PoE Injectors at [blackbox.com/inj\\_poe](http://blackbox.com/inj_poe) ►

## Typical Applications



## Black Box Explains: PSE vs. PD

A PoE-compatible device can be a power source device (PSE or power sourcing equipment), a powered device (PD) or sometimes both. A PSE is a device that transmits power to a PD over an Ethernet cable. PSEs also identify and classify PDs in the network to ensure they are giving out the correct amount of power to each device.

The majority of PSEs are network switches, hubs and injectors.

The devices that receive power from a PSE are PDs. IP security cameras, VoIP phones and wireless access points are all examples of PDs.

# WHY BLACK BOX

## **Expertise**

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

## **Breadth**

Black Box offers the most comprehensive suite of engineered KVM, AV and infrastructure solutions in the industry.

## **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.

## **Service Level Agreements**

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

## **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.

## **Warranties**

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

## **Center of Excellence**

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