

# INCREASE THE POWER OF YOUR NETWORK



110 POWER OVER ETHERNET  
010 & INTERNET OF THINGS

0 APPLICATION 010  
1 GUIDE 011001110

THE GLOBAL SPECIALIST  
IN ELECTRICAL AND DIGITAL BUILDING INFRASTRUCTURES



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# POWER OVER ETHERNET



Power over Ethernet (PoE) is a technology that enables powered devices, such as wireless access points (WAPs), security cameras, IP phones (VoIP), building automation and control systems, lighting and more generally the Internet of Things (IoT), to receive electrical power and data over the same Ethernet cabling, supporting the same 100 m transmission distance.

POWER OVER ETHERNET IS PART OF THE  
LEGRAND LCS<sup>3</sup> SYSTEM: 3 DIMENSIONS OF  
EXCELLENCE FOR DATA CENTERS AND  
LOCAL AREA NETWORKS



3 DIMENSIONS  
OF EXCELLENCE

● PERFORMANCE ● SCALABILITY ● EFFICIENCY



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# PoE THE POWER OF THE NETWORK

POWER OVER  
ETHERNET IS  
A SIMPLE,  
COST-EFFECTIVE  
WAY OF DELIVERING  
DATA AND POWER  
TO ETHERNET  
CONNECTED  
DEVICES

Power over Ethernet (PoE) has emerged as a key powering strategy, allowing network managers, installers and integrators to use structured cabling to provide both power and data to many of their network devices.

PoE minimises the number of cables required to install a network device, resulting in lower costs, less downtime, increased flexibility and simplified maintenance.

## PoE APPLICATIONS:

- 1 Wireless access points
- 2 Security cameras
- 3 IP phones
- 4 Intelligent LED lighting
- 5 Occupancy sensors
- 6 Climate sensors
- 7 Access/Building automation controls
- 8 Digital signage
- 9 Loudspeakers
- 10 Visible light communication (i.e. Li-Fi)





# PoE IOT INFRASTRUCTURE

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The Internet Protocol (IP) has played a key role in the convergence of information and media delivery, and it will empower the Internet of Things era as well.

IP convergence will be especially important within the next generation of commercial buildings, an ecosystem of ubiquitous heterogeneous devices, people and systems interacting in real time. As we migrate towards an inevitably fully IoT-enabled building, we will see the convergence of power, light and data over a common cabling system for a variety of applications.

## CONNECTED DEVICE

This can refer to a wide variety of "Things" such as smart thermostats, phones, security cameras, security badges, and more. These devices support various applications by collecting useful data with the help of various existing technologies and then autonomously communicating the data between other devices to make enhancements to the surrounding environment without human interaction. Connected devices often leverage IP and many are PoE ready.

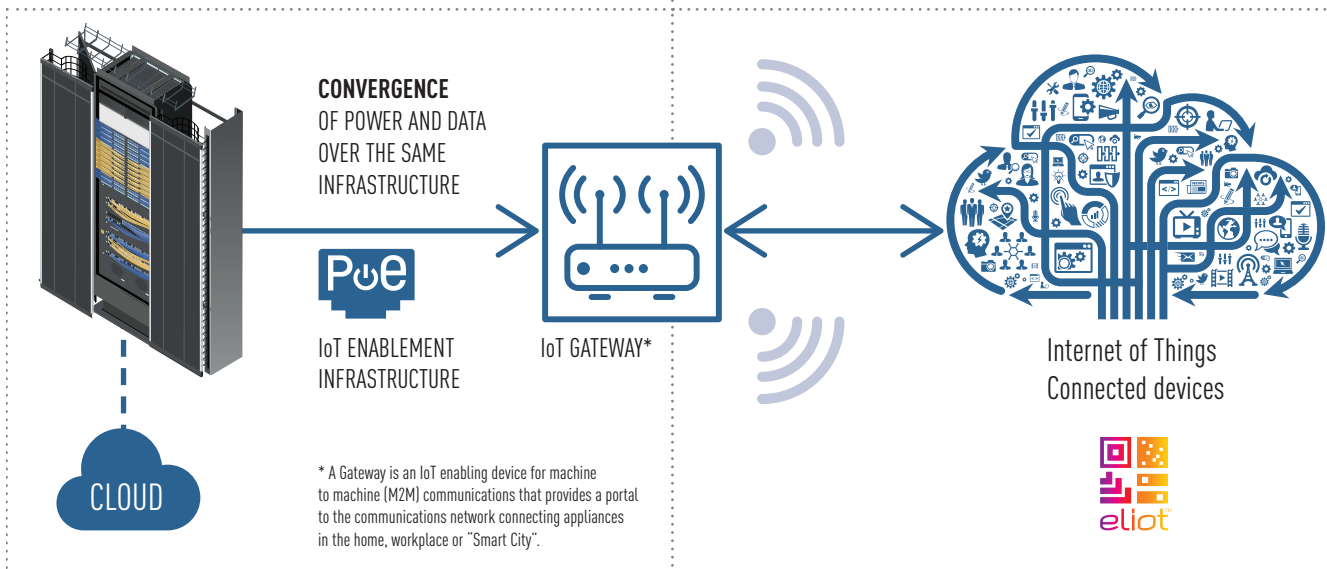
## ENABLING INFRASTRUCTURE

This refers to the structure beyond the "Things" that make the IoT philosophy possible. It includes the platforms which facilitate a common language for all devices to communicate freely, the "collect and act" scenarios that are the essence of the IoT movement and the "enablers", such as PoE delivery, WAPs, gateways and edge devices. The cabling infrastructure that makes up the "physical" deployment of the IoT installation is at the core of these systems. A structured cabling infrastructure provides the required foundation to support these applications.

A STRUCTURED CABLING  
INFRASTRUCTURE PROVIDES  
THE REQUIRED FOUNDATION  
TO SUPPORT THESE APPLICATIONS

## BloT

**BloT** stands for the **BUILDING Internet of Things** which allows us to focus on all the components in a building that could be connected to the network (the Internet) for the purpose of creating operational efficiencies, reducing energy consumption, improving occupant experiences, achieving sustainability goals and effectively optimising financial performance.



# PoE ADVANTAGES

In addition to cost savings, PoE provides multiple benefits, including design flexibility, increased reliability and simplified global deployment due to the use of a common power connection in all regions of the world.



## COST SAVINGS

PoE helps you to save time and money by avoiding the need to install electrical infrastructure near the Ethernet devices to be connected.



## DESIGN FLEXIBILITY

Networking devices can be easily moved without the need to schedule an intervention to install an electrical outlet. Ethernet equipment can be connected wherever there is an RJ 45 socket.



## SIMPLIFIED GLOBAL DEPLOYMENT

Using a universal RJ 45 socket to connect equipment anywhere in the world.



## INCREASED RELIABILITY

A UPS will protect against power cuts on all PoE connected equipment.



# PoE STANDARDS



Applications converging over IP allow communications to occur over Ethernet, a common standard which has evolved to support both data and low voltage power over industry standard category cabling. Many of the applications mentioned previously are also leveraging devices that have become more power efficient. With these devices having lower power requirements, they are now able to be powered using low-voltage direct current (DC) over a single Ethernet cable.

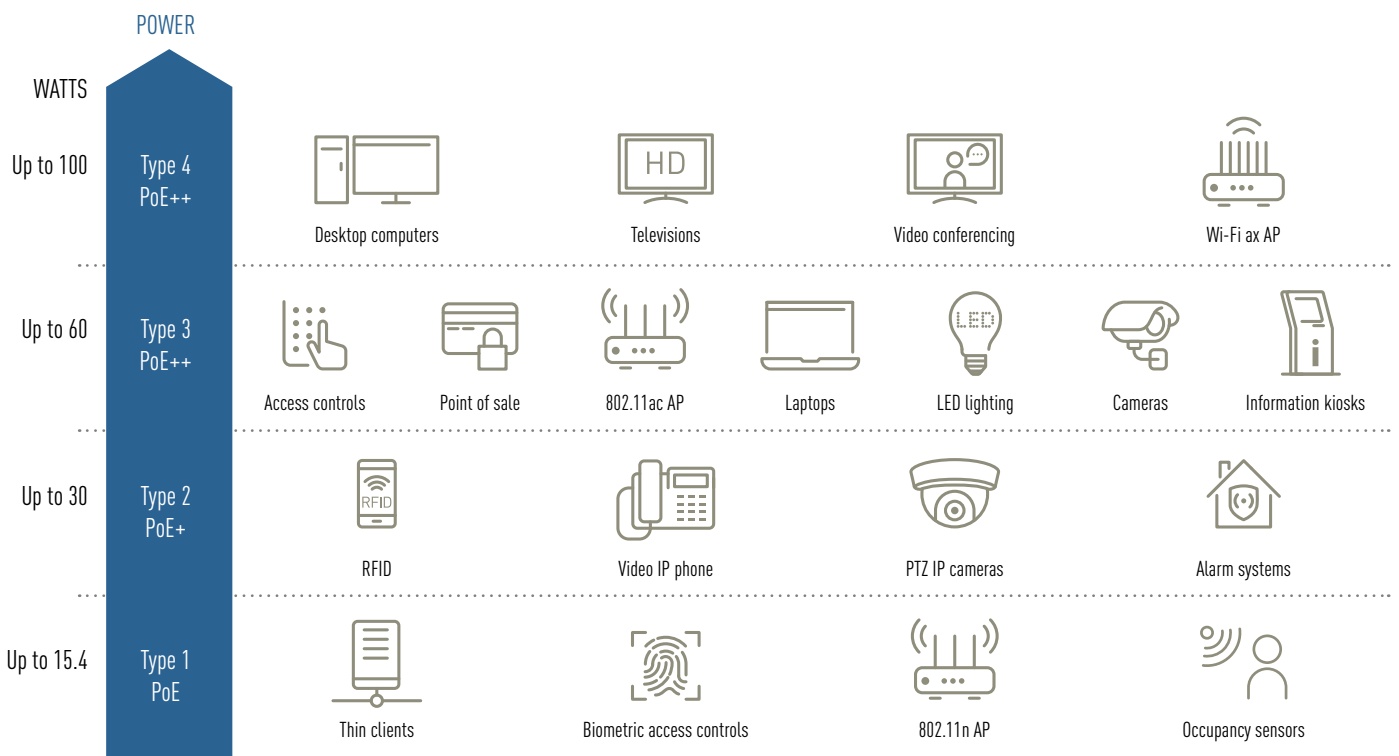
## STANDARDS AND APPLICATIONS

Organisation/standard	Watts from power source equipment
IEEE 802.3af 2-pair PoE	Up to 15.4 W
IEEE 802.3at 2-pair PoE+	Up to 30 W
IEEE 802.3bt (Type 3) 4-pair PoE	Up to 60 W
IEEE 802.3bt (Type 4) 4-pair PoE	90 W



The IEEE sets the standard for Power over Ethernet (PoE) which allows for the simultaneous transmission of data and low-voltage power over Ethernet cabling. With the ratification of 4-pair PoE, 802.3bt, the latest IEEE standard allow up to almost 100 Watts of DC power to be delivered from the power source equipment alongside data transmissions in a single category cable.

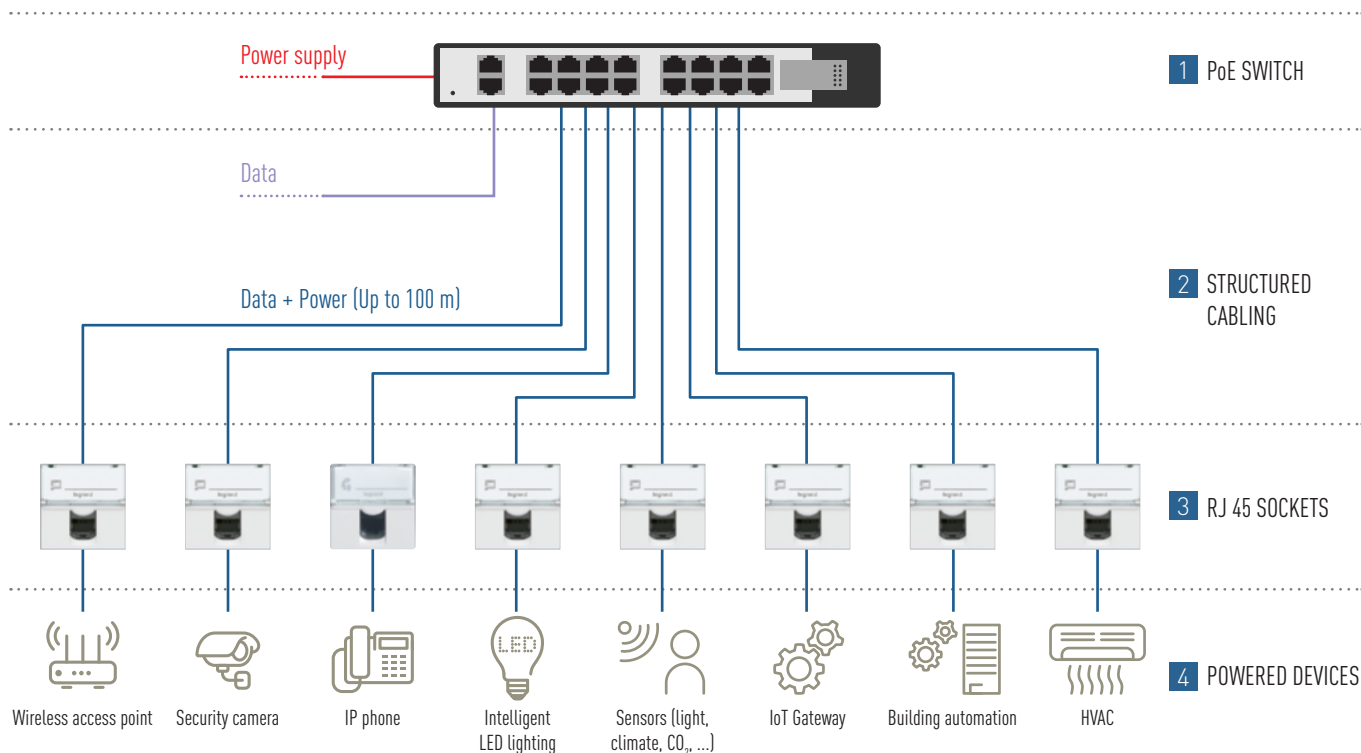
When considering a connected infrastructure design, it is important to start by determining the type of applications that will be implemented, both now and in the future, and then determine the power supply requirements needed to power the connected devices.





# PoE ARCHITECTURE

BUILDING SYSTEMS ARE MOVING TO A SINGLE IP NETWORK



## 1 PoE SWITCH

A Power over Ethernet switch is a device which supplies power and data on Ethernet cabling. It is draw power from its own conventional power source and provide power to the rest of the PoE system.



## 2 STRUCTURED CABLING

The twisted pairs cable is the power and data transmission medium of a PoE system. It is used to provide the link between two devices enabling bi-directional communication and uni-directional supply of power.



Shielded Category 6A cabling is recommended for optimum future-proofing and is the best choice for the Internet of Things and is recommended by current design standards for BIoT.

## 3 RJ 45 SOCKETS

Universal RJ 45 socket to connect devices.



## 4 POWERED DEVICES

A powered device is a device which receives power from the power sourcing equipment. It does not require its own conventional power source.

# LEGRAND'S VALUE PROPOSAL

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## COPPER SYSTEM / PoE CERTIFICATION

Using PoE technology, devices such as Wi-Fi access points, cameras, etc. can be supplied with power by Ethernet data cable. The cable combines data and power to supply all the PoE peripherals.

The LCS<sup>3</sup> connectors are PoE++ Third Party Certified (up to PoE Type 4).

**LCS<sup>3</sup>**  
3 DIMENSIONS  
OF EXCELLENCE  
● PERFORMANCE ● SCALABILITY ● EFFICIENCY

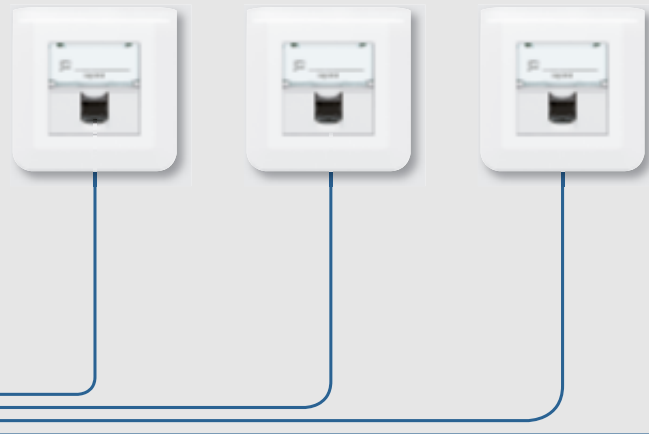
**PoE++**  
Third Party  
certified



CENTRAL POINT  
OF THE STAR

RJ 45 SOCKETS

UP TO 100 W PoE  
APPLICATIONS



## COMMITMENTS ON PoE

Legrand solutions comply as per below:

- Cables: 802.3bt PoE++ applications compatible according to installation standards ISO/IEC 14763-2 and EN 50174-2:2018.
- Connectors: Compatible remote powering “PoE” up to 100 W (IEEE 802.3af, IEEE 802.3at, IEEE 802.3bt). Third party certified IEC 60512-99-002 for disconnection under PoE Type 4.
- Patch cords: Compatible remote powering “PoE” up to 100 W (IEEE 802.3af, IEEE 802.3at, IEEE 802.3bt) when installed according to standards ISO/IEC 14763-2 and/or and EN 50174-2:2018.

## QUALITY & PROTECTION

Due to the high power in PoE++, the choice of a high-quality connector is essential. While disconnected, Legrand’s high-quality connectors prevent damage to the contacts due to the arc generated.



CONNECTED DEVICE CONFIDENT  
IN THE DESIGN AND QUALITY OF  
OUR SOLUTIONS, WE OVERPERFORM  
AND GUARANTEE FOR SHIELDED  
LCS<sup>3</sup> SYSTEM 90 METERS PERMANENT  
LINK\* AT 40°C TEMPERATURE WITH  
UP TO 100 WATTS PoE.



\*With 2m cord in the technical room and 5m cord at user side.  
Contact us for other configurations.

# OUR SOLUTIONS FOR PoE BUILDING INFRASTRUCTURE

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With devices and applications leveraging the IP for communication and Ethernet providing a standard method for delivery, we are seeing the convergence of connected devices over Ethernet. This allows for IoT networks to be designed and managed alongside existing and evolving industry standards, including TIA and IEEE, to ensure safe and consistent operation of devices on a common infrastructure.



CONNECTED INFRASTRUCTURE

# RE



## LEGRAND'S SOLUTIONS FOR PoE



**DC DATA CENTER**  
• Server system

**A TELECOMMUNICATIONS ROOM**  
• Racks • Cabinets • Cable management  
• Power distribution units • Patch panels  
• Connector blocks • Patch cords  
• Fibre cables • Fibre optic drawers  
• PoE switch • UPS

**B CABLING/CABLE MANAGEMENT**  
• Copper cable • Wire mesh cable tray  
• DLP trunking

**C CONSOLIDATION POINT**  
• Area distribution boxes

**D WALL-MOUNTING CABINETS**

**E POWERED DEVICES**  
• Emergency lighting luminaires

**F WORKSTATION RJ 45 SOCKETS**  
• RJ 45 sockets • Patch cords

**G WI-FI ACCESS POINTS**

# PoE CONNECTED INFRASTRUCTURE

LEGRAND PROVIDES  
THE INFRASTRUCTURE  
SOLUTIONS FOR PoE  
ENABLEMENT

Legrand is an enabler providing the physical infrastructure and connectivity required to support your PoE installation. With over 50 years of data communications excellence, the breadth of our offer positions us as an all-in-one infrastructure provider to enable whatever powered device you deploy, in any environment.

At Legrand, our design philosophy is centred around connected infrastructure and the 5 elements which ultimately drive value to you, our customers.

Connected infrastructure combines our solutions, industry leading customer advocacy, design and support teams, for a comprehensive approach to your network. Through connected infrastructure, we aim to deliver maximum performance, time savings, space optimisation, superior customer experience and sustainability by design, to address your challenges, today and tomorrow.



CONNECTED INFRASTRUCTURE

## PERFORMANCE

- Efficient power delivery
- Robust current carrying capacity
- Arcing protection

## TIME

- Automated control
- Efficient moves, additions or changes
- Easy installation and deployment

## SPACE

- Support any density
- Flexible design
- Support for centralised or decentralised models

## EXPERIENCE

- Application tested solutions
- Complete library of resources and white papers
- Partnerships with industry leaders



## SUSTAINABILITY

- PEPs contribute towards LEED
- Legrand is a sustainability leader
- Expertise in power efficiency



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