# LCS2 GUIDE

## PERFORMANCE
FROM TECHNICAL ROOM
TO WORKSTATION

**THE GLOBAL SPECIALIST** IN ELECTRICAL AND
DIGITAL BUILDING INFRASTRUCTURES

legrand®
LIVE THE ADVANTAGE

# CONTENTS

# LEGRAND CABLING SYSTEM²

## PERFORMANCE FROM THE TECHNICAL ROOM TO THE WORKSTATION

## Legrand's expertise

The Legrand group is a world leader in communication networks for data transmission. Its investment in the development and design of structured cabling systems and solutions has enabled it to develop its offer and achieve the highest performance levels. These solutions are ideal for today's multimedia networks, technologies and applications.

## Legrand (India) Offers

The new LCS² offering includes copper (Cat. 6A, Cat. 5 and Cat. 5e), fibre optic and Wi-Fi solutions as well as enclosures. The systems have been designed as coherent entities to optimize their performance. Legrand also offer standard solution to cater across all the segment.

Additional benefit: the perfect synergy with either Legrand products and solutions such as cable management, trunking systems, installation supports or wiring devices. Legrand's solutions allow to create coherent and efficient systems from the technical room through to the workstation.

## A complete solution

Legrand provides complete ranges, to meet three requirements:

- LCS² Network performance
- Accessibility of the infrastructures inherent to the communication networks of service sector buildings (offices, hotels, shopping centres, university campuses, healthcare establishments, etc.).

This guide has been designed to provide you with technical answers and the product-based solutions to your problems.

# LCS² NETWORK PERFORMANCE

## LCS² complete systems with a 25-year guarantee

LCS² cat. $6_A$ (up to 500 MHz), cat. 6 (up to 250 MHz) and cat. 5e (up to 100 MHz) systems have been designed as coherent entities to optimise their performance from the technical room to the workstation.

These systems are suitable for fibre optic cables as well as copper cables. Measurements of LCS² components and links are validated by independent laboratories 3P Third Party Testing and ETL.

## LCS² category $6_A$ designed to exceed all application requirements

With LCS² category $6_A$, Legrand guarantees installed channel performance exceeding all category $6_A$ crosstalk requirements by **5dB /TIA*** or **3dB /ISO*** and exceeding all category $6_A$ return loss requirements by **3dB /ISO-TIA*** for configurations and installations conforming to standards, as well as on-site testing conducted by verified testing agents.

** Depending on the degree of accuracy offered by the tester at the test point.*

### Guaranteed applications

| | |
|---|---|
| 10Base-T | 155 Mbps ATM |
| 100Base-TX | 270 Mbps digital video |
| 1000Base –T | Broadband video |
| 1000Base-TX | 1.2 Gbps (CBIG) ATM |
| 10GBase-T | 10 Gigabit Ethernet |

### Compliance with standards

ANSI/TIA/EIA 568-C2
ISO/IEC – 11801 (second edition) class $E_A$ amendment 2

### LCS² Cat. $6_A$ channel components

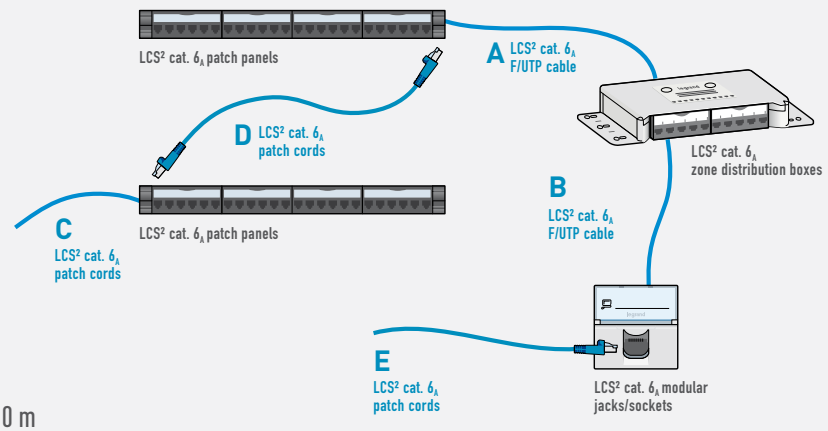
- LCS² category $6_A$ F/UTP cables Cat.No 0 327 78
- LCS² category $6_A$ RJ 45 sockets
- LCS² category $6_A$ patch panels
- LCS² category $6_A$ patch cords

### 100 metre horizontal channel

The LCS² category $6_A$ channel is designed to offer flexibility. Legrand LCS² solutions have been designed to optimise application performance by using all standardised channel lengths and configurations.

With Legrand LCS² category $6_A$ solutions, it is no longer necessary to determine specific installation specifications or particular patch cable width limits.

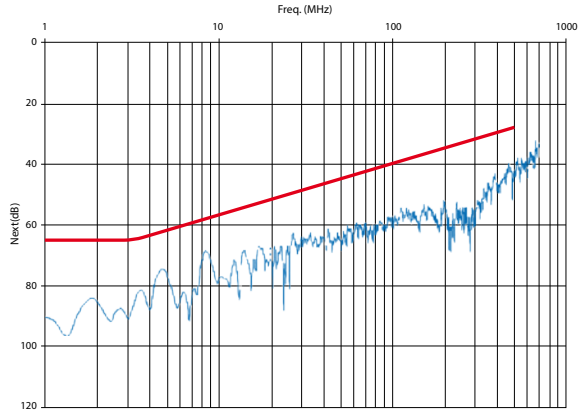
## WIRING PRINCIPLE



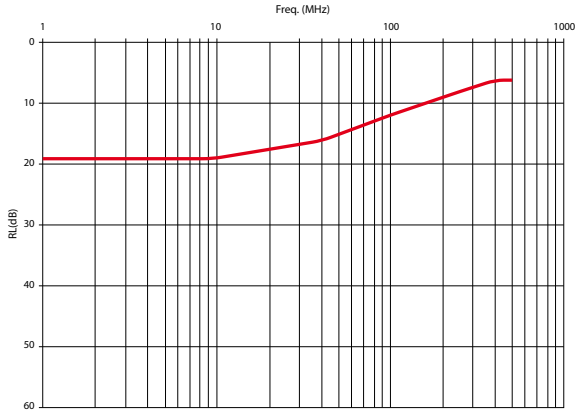

A+B = 90 m, C+D+E = 10 m

## LCS² category $6_A$ performance

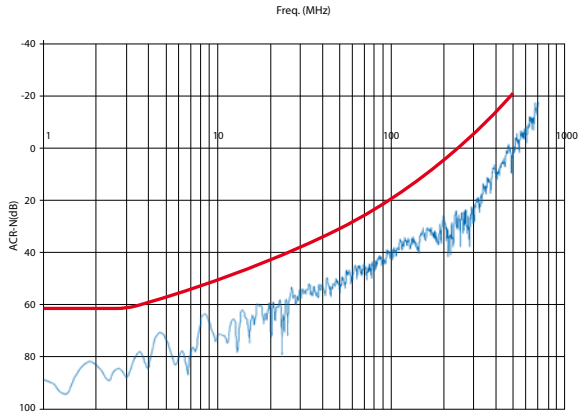
The results of independent trials shown below allow comparison of worst performance obtained from a 100-metre LCS² channel with 4 connectors conforming with ISO standard category $6_A$ specifications.
The significant margins shown for each measured parameter demonstrate the technical superiority of the LCS² category $6_A$ solution.
These performance margins are consistent across the ISO/TIA standard tested frequency range and even beyond.



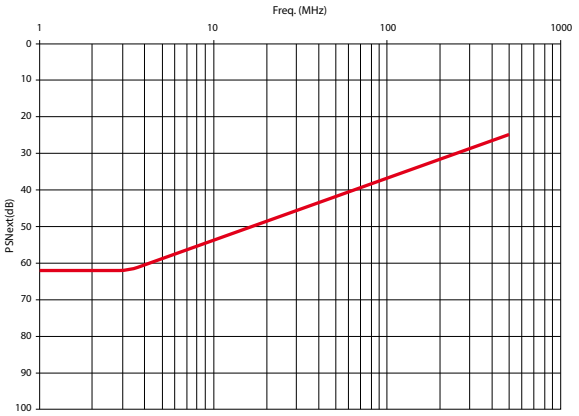

NEXT




RETURN LOSS




ACR-N




PS NEXT

| Frequency (MHz) | NEXT (dB) ISO11801 Channel Class $E_A$ | NEXT (dB) LCS² Channel Class $E_A$ | ACR-N (dB) ISO11801 Channel Class $E_A$ | ACR-N (dB) LCS² Channel Class $E_A$ | RL (dB) ISO11801 Channel Class $E_A$ | RL (dB) LCS² Channel Class $E_A$ | PS NEXT (dB) ISO11801 Channel Class $E_A$ | PS NEXT (dB) LCS² Channel Class $E_A$ | PS ACR-N (dB) ISO11801 Channel Class $E_A$ | PS ACR-N (dB) LCS² Channel Class $E_A$ | ACR-F (dB) ISO11801 Channel Class $E_A$ | ACR-F (dB) LCS² Channel Class $E_A$ | PS ACR-F (dB) ISO11801 Channel Class $E_A$ | PS ACR-F (dB) LCS² Channel Class $E_A$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 65 | 68 | 61 | 64 | 19 | 22 | 62 | 65 | 58 | 61 | 63.3 | 66.3 | 60.3 | 63.3 |
| 4 | 63 | 66 | 58.9 | 61.9 | 19 | 22 | 60.5 | 63.5 | 56.4 | 59.4 | 51.2 | 54.2 | 48.2 | 51.2 |
| 10 | 56.6 | 59.6 | 50.1 | 53.1 | 19 | 22 | 54 | 57 | 47.5 | 50.5 | 43.3 | 46.3 | 40.3 | 43.3 |
| 20 | 51.6 | 54.6 | 42.5 | 45.5 | 17.5 | 20.5 | 49 | 52 | 39.8 | 42.8 | 37.2 | 40.2 | 34.2 | 37.2 |
| 31.25 | 48.4 | 51.4 | 36.9 | 39.9 | 16.5 | 19.5 | 45.7 | 48.7 | 34.2 | 37.2 | 33.4 | 36.4 | 30.4 | 33.4 |
| 62.5 | 43.4 | 46.4 | 27 | 30 | 14 | 17 | 40.6 | 43.6 | 24.2 | 27.2 | 27.3 | 30.3 | 24.3 | 27.3 |
| 100 | 39.9 | 42.9 | 19 | 22 | 12 | 15 | 37.1 | 40.1 | 16.2 | 19.2 | 23.3 | 26.3 | 20.3 | 23.3 |
| 200 | 34.8 | 37.8 | 4.7 | 7.7 | 9 | 12 | 31.9 | 34.9 | 1.8 | 4.8 | 17.2 | 20.2 | 14.2 | 17.2 |
| 250 | 33.1 | 36.1 | -0.8 | 2.2 | 8 | 11 | 30.2 | 33.2 | -3.7 | -0.7 | 15.3 | 18.3 | 12.3 | 15.3 |
| 300 | 31.7 | 34.7 | -5.6 | -2.6 | 7.2 | 10.2 | 28.8 | 31.8 | -8.6 | -5.6 | 13.7 | 16.7 | 10.7 | 13.7 |
| 400 | 29.6 | 32.6 | -14.1 | -11.1 | 6 | 9 | 26.6 | 29.6 | -17.1 | -14.1 | 11.2 | 14.2 | 8.2 | 11.2 |
| 500 | 27.9 | 30.9 | -21.4 | -18.4 | 6 | 9 | 24.8 | 27.8 | -24.5 | -21.5 | 9.3 | 12.3 | 6.3 | 9.3 |

# LCS² fibre optic high density system

LCS² high density fibre optic drawers are easy to install and maintain, offering complete accessibility and built-in coiling accessories.

19"- Fibre optic drawer with front and rear cable management, 2U (p. 101)

19" high density fibre optic drawer and cassettes (p. 100)

## A flexible and easy to install system

A ready made system compared to traditional installation: fully populated modules and preterminated trunks. Installation is cut to a minimum: one single connection connects 12/24 fibres instantly. (MTP/MPO interfaces)

- Easy installation of 24-fibre modules (12-fibre modules available on request)
- Fixed mid-module position for easy patch cord installation and port access: no need for extraction tool
- Open chassis for front and rear module access
- Front and rear cable management
- A or C polarity (B available on request)
- Compatible with 1 U - 5 modules chassis (up to 120 LC ports) and with 2 U - 12 modules chassis (up to 288 LC ports)

## Custom solutions available on request

- Preterminated MTP/MPO trunks
- Factory preterminated module
- Terminated end (MTP, LC, breakout module, etc.)
- Splice module

# Fibre optic solutions in buildings tackling the latest challenges in buildings

LCS² FTTO/FTTD solutions will satisfy the needs of users with its enhanced performance in terms of speed, energy saving and modularity over increasing distances.

FTTO switch for trunking (p. 104)

FTTO switch for false celling/false floor (p. 104)

## Economic and environmental performance for full IP convergence buildings

- Gross speed up to 300 m in OM 3 and thousands of metres in OS 1/OS 2
- Less equipment required in technical rooms
- Optimised digital infrastructure thanks to better fibre density
- Energy saving switches: consumption of the transmitted data is lower through the fibre material (no ventilation inside)

# Legrand enclosures
## the first layer of protection

When you consider the devastating impact that downtime or data loss can have on a business, the network protection appears obvious. Enclosures are the first physical layer of protection for a network.

Enclosures protect networks and live equipment against **accidental external damage or contact:**
- IP 20 (conforming to IEC/EN 60529) provides protection against solid objects and liquids
- IK 08 (conforming to IEC/EN 60062) provides protection against mechanical shock.

Enclosures also protect against **unauthorised access.** All cabinets are lockable to prevent malicious acts or unintended operation by unauthorised personnel.

More importantly, enclosures must **ensure the safety of people**. As they house the AC power for active equipment (switches, servers, PABX, etc.), cabinets must protect people against electrical shock in the event of a fault.
That's why Legrand implements strict controls in terms of enclosure design and manufacture. All metal parts in enclosures are linked together to guarantee earthing.

### Accessories automatically integrate this function to prevent accidents

Quick-fixing system provides automatic earthing on patch panels and shelves.

Automatic earthing clip earths the side and rear panels.

# NETWORK ACCESSIBILITY

Legrand offers a comprehensive range of products from cable management to workstation products for cable distribution and network accessibility solutions in buildings.

## Cablofil® a full cable management solution

Cablofil is the most versatile cable tray. Made from welded steel wires, Cablofil meets the strictest safety standards and satisfies the customer's need for reliability and fast, economical installation.

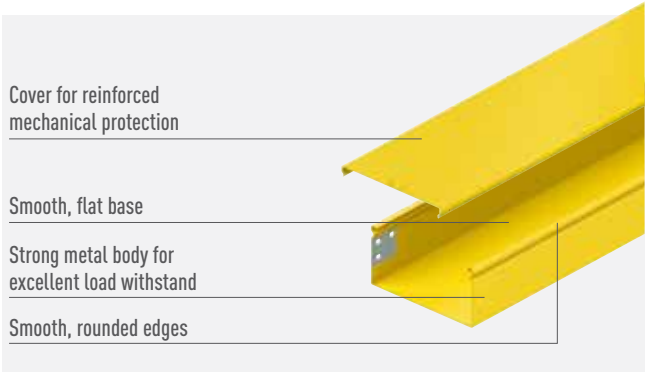
Available in a large choice of surface treatments, it is also possible to obtain the entire range of RAL colours in applying a resin-based paint.

Data cabling - In order to manage data installations and master their complexity, it is necessary to have a high performance cabling system which has the capacity to evolve. With the relevant standards in mind, CABLOFIL® helps design, organise and arrange a variety of cabling systems, whilst also ensuring system safety.
First and foremost, a cable tray must act as an effective, resistant and durable support for cables. The mechanical performance of all products and accessories is tested against the very demanding requirements imposed by the international standard IEC 61537 and can ensure large spans and support big loads. The open structure maximises ventilation and therefore reduces installation and operational costs.

## P31 OFT cable management solutions for fibre optic cables

Specially designed to meet the requirements of data center, the P31 OFT range provides excellent technical performance levels and can be used for building complex installations using both fibre optic and copper. The rails and accessories provide a high degree of strength and excellent withstand to heavy loads.

The integration of the P31 OFT provides a high degree of uniformity for all cable routing with its metal construction and metric lengths.
This range, with its specific dimensions and dedicated accessories, ensures compliance with the fibre optic bending radius right up to where the cables are routed down to the VDI patch cabinets.



# LCS² Cabinets ensure evolution and maintenance

A network is a living organism. Cabinets must offer features and solutions which will allow for expansion and maintenance.

## LCS² cabinets facilitate network access and scalability

Total accessibility: thanks to the removable side panels

Easy access at the rear: pivoting body on wall-mounting cabinets

Dedicated space for cable management with easy access via door to cabling unit

Note:
In the case of crowded freestanding cabinets, cabinet capacity can be increased using vertical extensions.
For example, in a 42 U 800 mm wide cabinet, a set of 2 vertical trim plates can be used to increase the capacity by 12 U.

# Installation supports for workstations
## Networks within reach

Wall-mounted trunking, ceiling-mounted columns, floor-mounted floor boxes, multi-outlet extensions or mini-columns - there are supports to suit all workspace configurations.

### Wall-mounted supports

**DLP trunking**

Can be installed quickly and easily to supply workstations with power and data.
The system is easy to adapt to different room configurations.

### Ceiling-mounted supports

**Columns**

Supplied through a false ceiling, columns distribute power and data as closely as possible to the workstation.

### Floor-mounted supports

**Floor boxes**

Can be installed discreetly in a concrete or raised floor.
Floor boxes to be fitted with power and data sockets. Equipped versions available with Easybar and fast connection systems.

**Mini-columns**

Discreet and handy connection point underneath the desk. Four compartments to be fitted with power and data sockets.

For more information on the products ask for your free copy of the catalogue.

## Desk-mounted supports

With its new offer of integrated office solutions, Legrand provides users with functionality, ergonomics, comfort and speed of installation for various office building areas. Pop-up boxes and power and data desk grommets integrate harmoniously in all types of furniture for meeting rooms, private or open plan offices.

**Pop-up boxes**

Our sleek new ergonomically designed pop-up boxes provide real ease of use and rapid connection solutions for mobile applications with mains voltage or ELV sockets.

**Desk grommets**

An ingenious ergonomically designed system that can be used to provide power, connect to the data network or recharge a mobile phone.

**Desktop modules**

Our desktop modules provide a high degree of flexibility and ease of use for both office-based and desk based users.

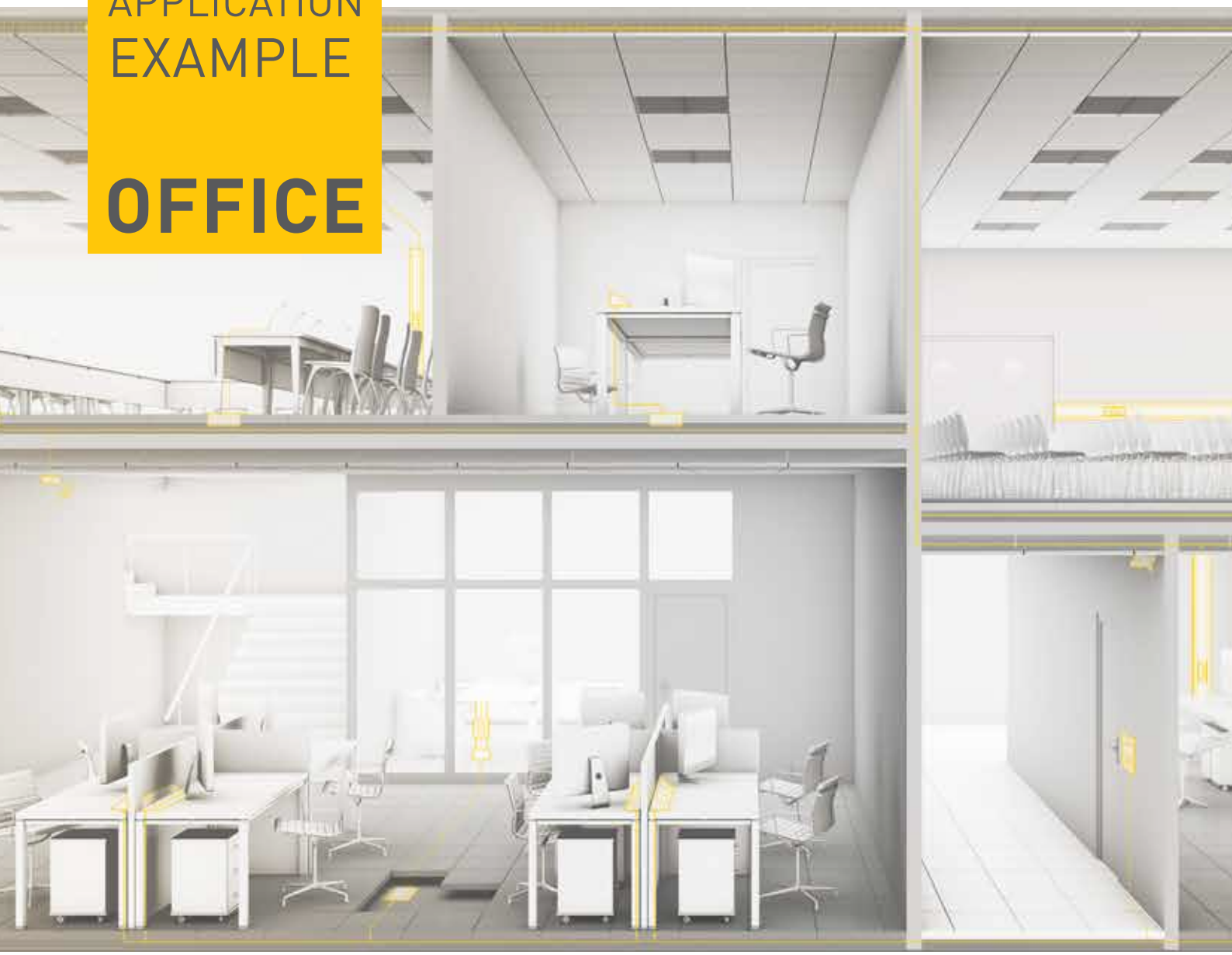
**Flush mounting office modules**

Can be installed in any office furniture or wall partition and configured according to the needs of the user.

For more information on the products ask for your free copy of the catalogue.

APPLICATION
EXAMPLE

# OFFICE




Active zone distribution box (p. 104)

Patch panel (p. 78, 83, 87, 88, 92)

# Flexible
## cabling systems

# Minimise
## upgrade costs

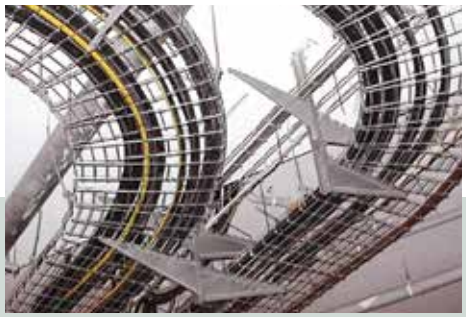
RJ 45 socket (p. 82)

LCS² cabinet (p. 107)

▶ Legrand's global solution also includes: cable management, power equipment...

APPLICATION EXAMPLE

# HYPER-MARKET



Cablofil wire mesh

Fibre optic socket (p. 103)


# **Safety** of property and people and **well-being** of customers

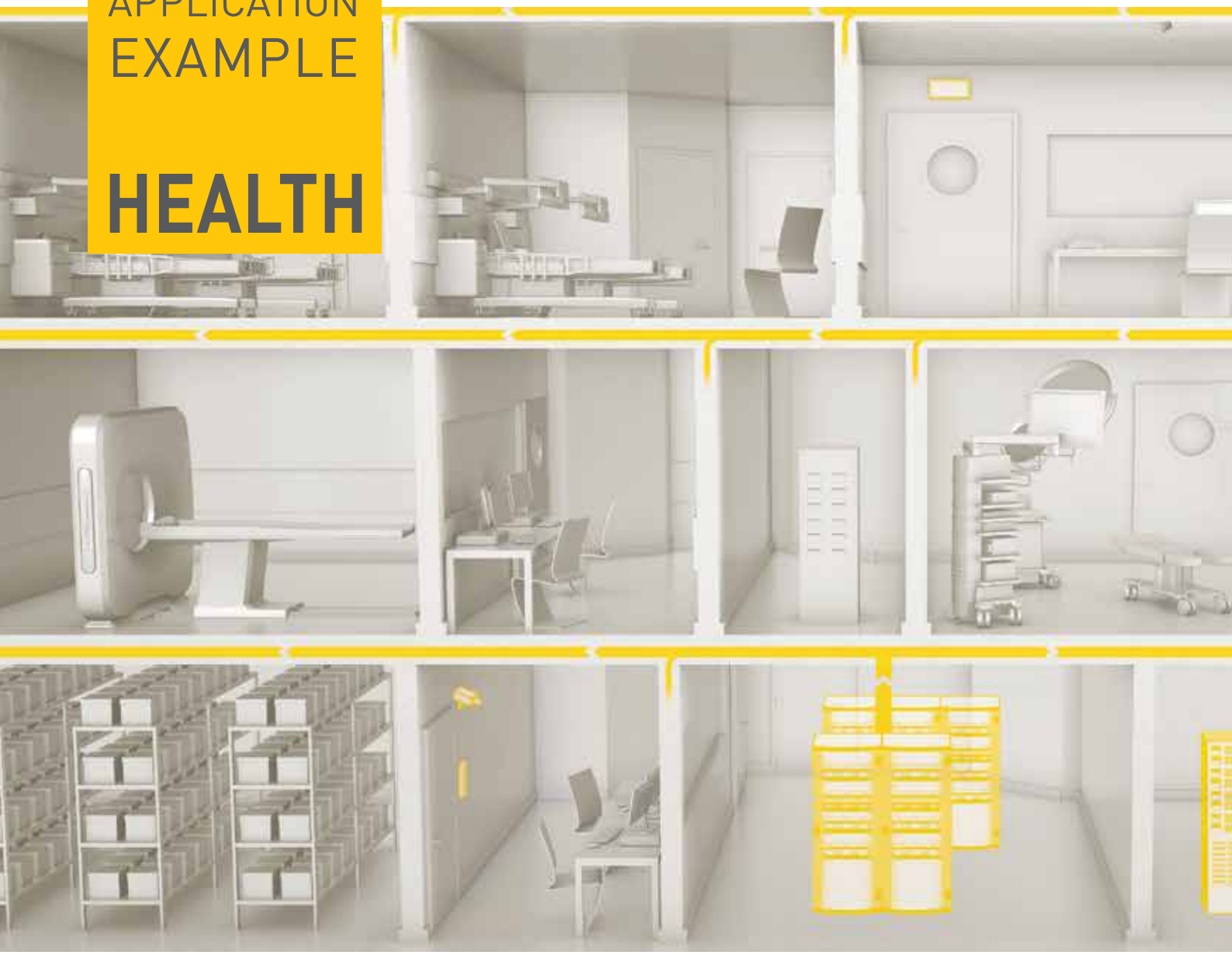
Pop-up box

Ethernet switch (p. 93)

▶ Legrand's global solution also includes: UPS, cable management, power equipment...

APPLICATION
EXAMPLE

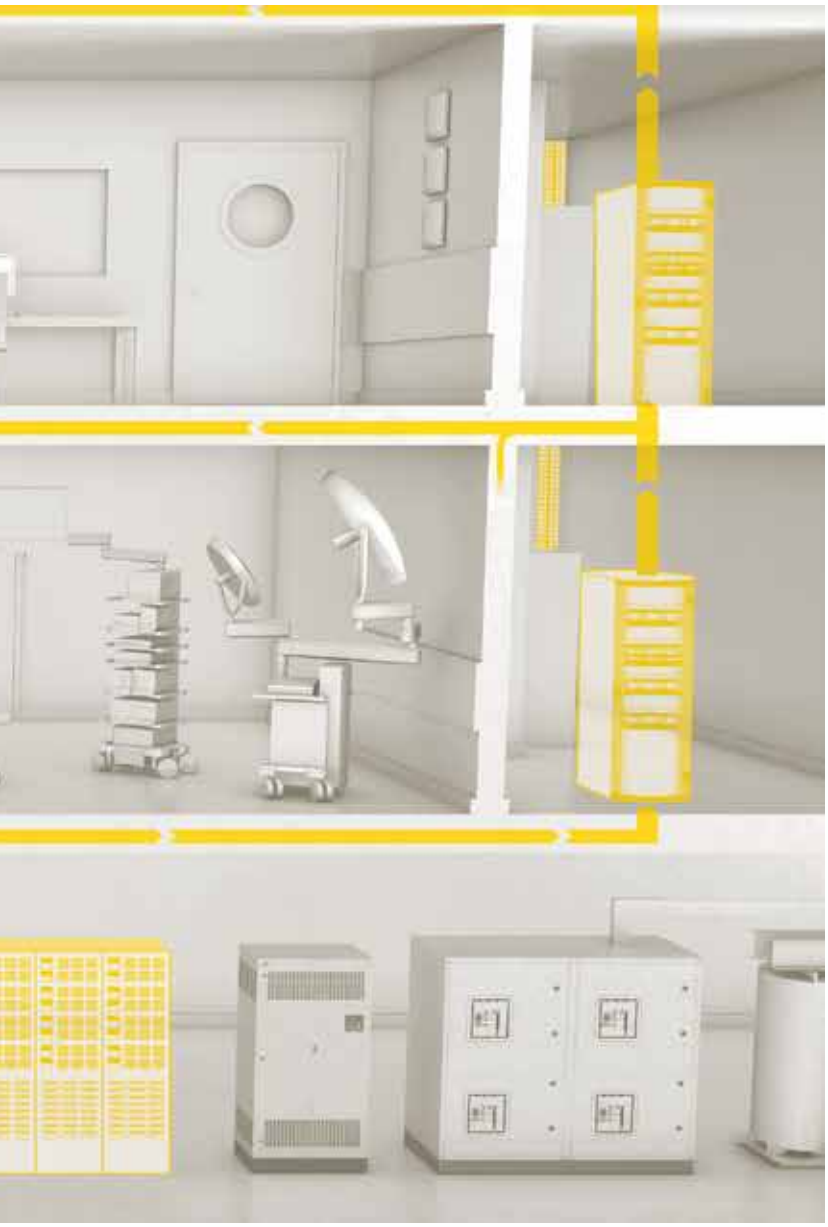
# HEALTH



Myrius anti-bacterial RJ 45 socket

Zone distribution box (p. 81, 85, 90)

# Security of people and their data



SCS sensor

▶ Legrand's global solution also includes: UPS, emergency lighting, power equipment, security systems...

APPLICATION
EXAMPLE

# CAMPUS

AVS socket (p. 120)

DLP trunking system

# Simplicity and safety when providing information

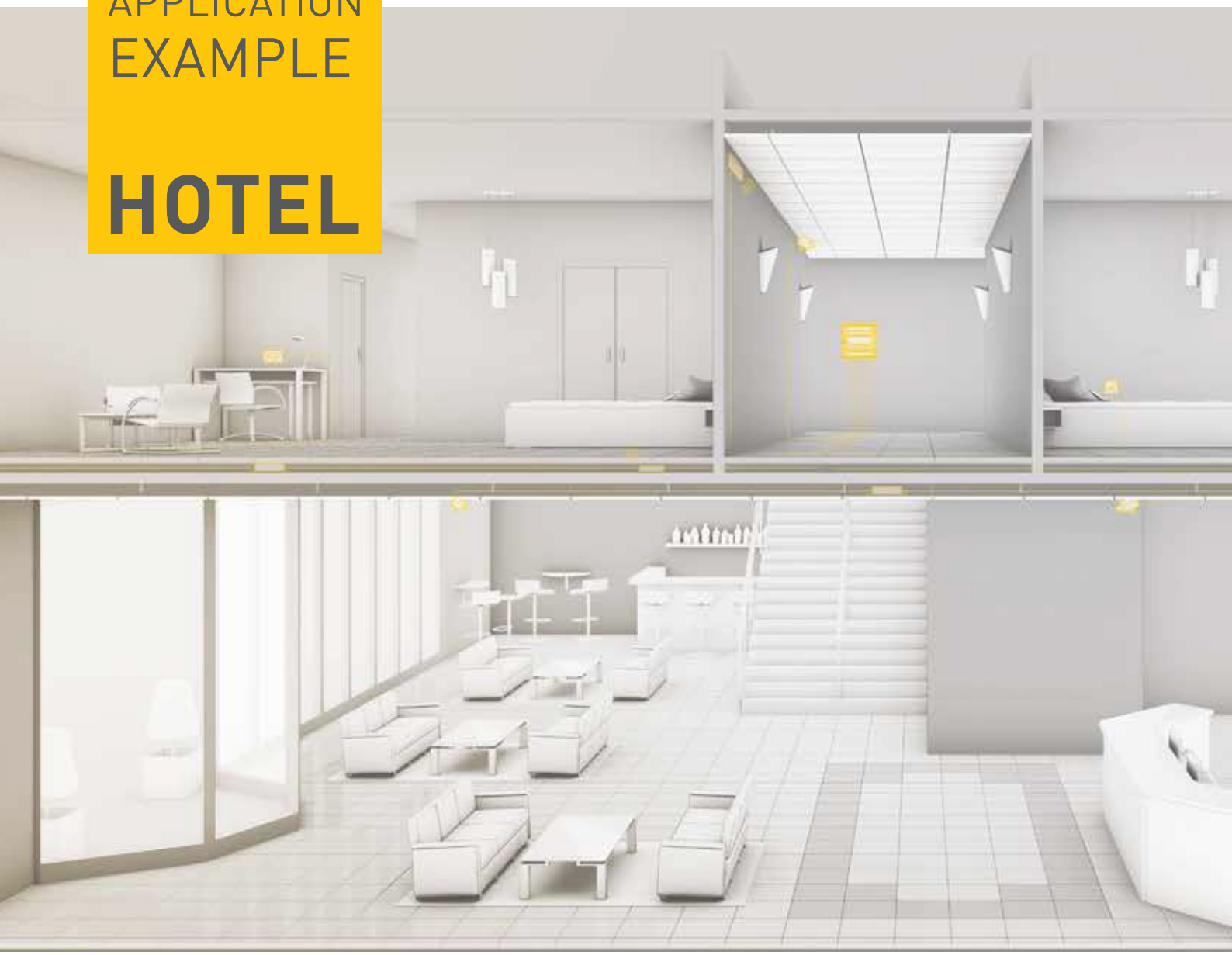
RJ 45 with controlled access (p. 82, 86)

Wi-Fi access point (p. 96)

▶ Legrand's global solution also includes: power equipment, security systems...

APPLICATION
EXAMPLE

# HOTEL



RJ 45 sockets

19" wall-mounting cabinet (p. 113)

# Availability and efficiency for the best service

Retractable RJ 45 socket (p. 86)

Patch cord (p. 80, 84, 87, 89, 92)

▶ Legrand's global solution also includes: wiring device, power equipment, cable management...

# 1 STRUCTURED CABLING

## 1.1 - Introduction and logic of structured cabling

IT and Telecommunications are at the heart of all activities. They require structures capable of carrying various signals (telephony, data, etc.) **flexibly, reliably and quickly.** Structured cabling is the response to these requirements. It has two key objectives: to group together companies' connection systems and to provide flexible management of the installations for distributing communication services, including telephony and data. A structured cabling installation reduces the costs of any modifications for the entire lifetime of the system, enabling **quick reconfiguration** of the transmission network, without having to work directly on the support infrastructure.

## 1.2 - Wiring structure

### 1.2.1 - Network topology

The term wiring implies the infrastructure (generally passive) at the origin of the network which is used to interconnect users and resources. There are numerous wiring configurations (loop, bus, star, etc.), each with its own advantages and disadvantages, both in terms of technology and scalability.

The only connection structure used for structured cabling systems is the hierarchical star, which provides a great deal of flexibility both in the installation phase and in extension and/or modification phases.

The physical connection structure is that actually used for the cables linking the nodes.

The logical structure refers to the method used by the nodes to communicate with one another. It is determined by the active network devices and the protocols used. The physical and logical structures are quite likely to be different.
The structure is referred to as a **hierarchical star**, as the wiring system may have several interconnection levels, depending on its complexity.

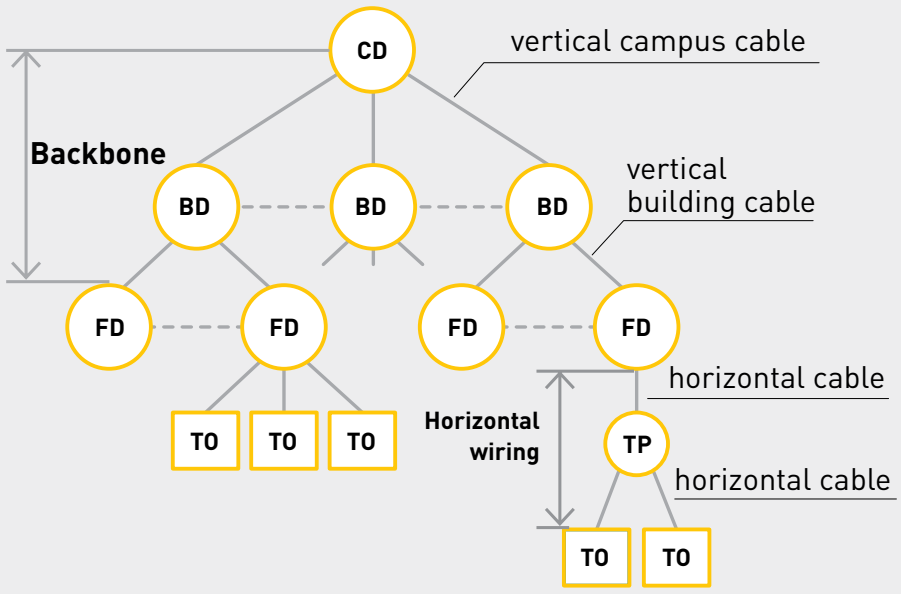
There are generally three levels, as follows:

**Floor wiring** (horizontal wiring)

**Building wiring** (vertical wiring)

**Campus wiring**

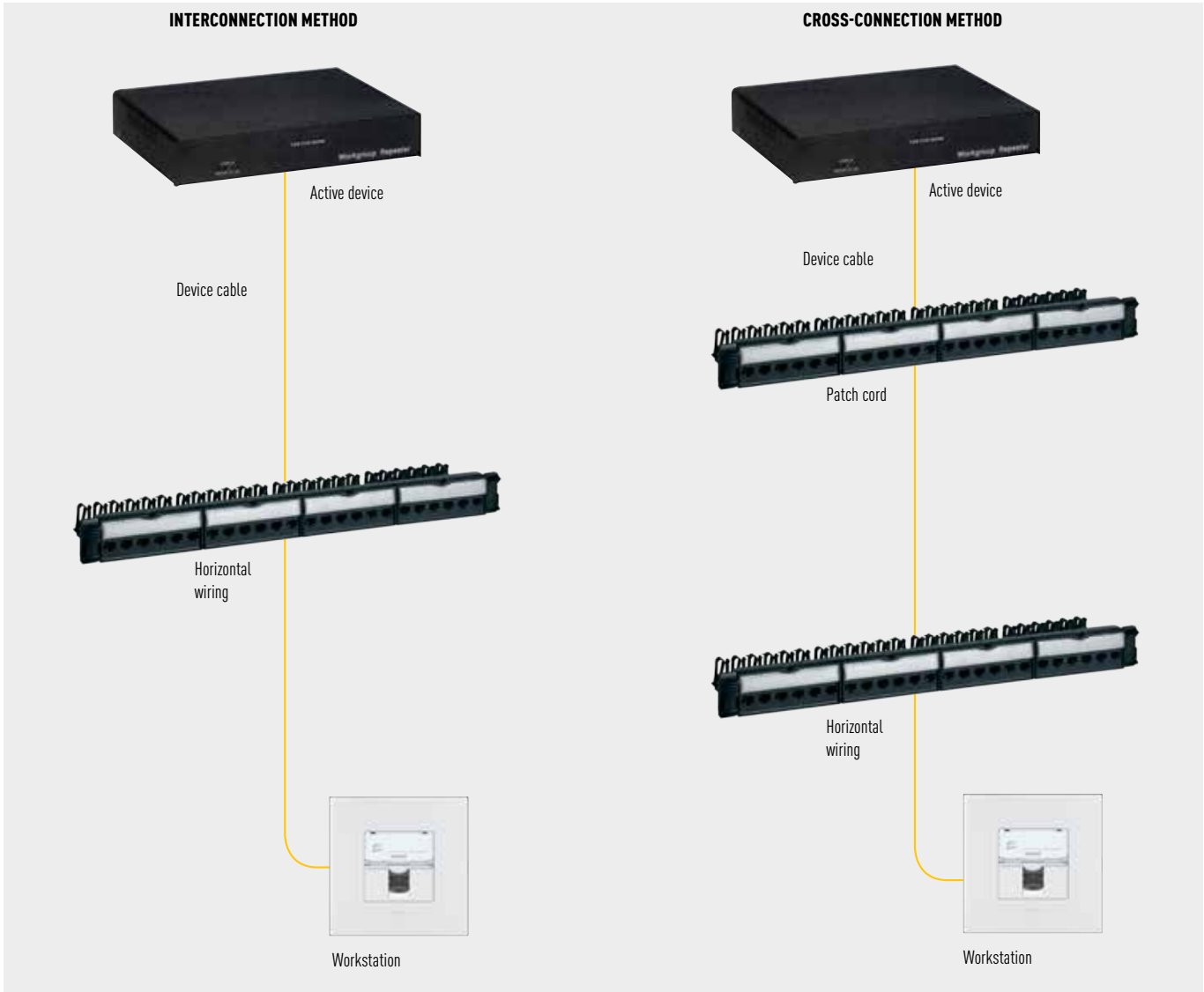
### EXAMPLE OF THE STRUCTURE OF A WIRING SYSTEM



## 1.2.2 - Patching

Each hierarchical level in the wiring system is therefore a series of cables converging towards a neutral point. The horizontal wiring is all the cables which run to the floor distributor from each telecommunications outlet. The vertical wiring consists of the cables which converge towards the building distributor (BD) from the floor distributors (FD), etc. Each branch of the wiring ends at an active device which connects the users to the network.
Extension and/or modernisation of the network, reconfiguration of the layout of the areas, reorganisation, replacement of devices, etc., are modifications which generally require a change of (user)/logical port cable connections. To meet this requirement, the principle of **patching** has been introduced.
The patch cord physically links a given user (identified by a port on the patch panel) to the network itself (identified by a port on the network device) and provides a high degree of flexibility in terms of reconfiguration. If, for example, a single user has to be moved from the workstation he/she usually occupies, it is very easy to reassign all the network services to the new workstation.
The type of structure just described is also called **simple patching**, as all the cords link the cable identification panel directly to the active device. It is also possible to create a slightly more complex structure, called **double patching**, in which the active device itself is also linked permanently to the ports on a panel identical to that which terminates the cables from the installation. In this case, the network connections are configured between two panels, i.e. between the "cable side" panel and the "device side" panel. The choice of this more complex, and more costly, structure (which requires twice the number of panels) is primarily associated with the need to protect the active devices. Frequently moving the network connections may damage the connectors involved.
If the damaged connector is in a patch panel, the damage is limited and can be repaired quickly (the connector can be replaced quickly). Conversely, if the damaged connector is on an active device, it is then necessary to send the whole device to the support centre, which involves much higher costs and has a much greater impact on the operation of the network.
With double patching, which is also called "Cross Connection", the ports on the device are no longer directly involved in the patching operations.
This principle applies to all the neutral points in the structure (FD, BD and CD) and is independent of the cable technology (copper or fibre optic).

## INTERCONNECTION AND CROSS-CONNECTION METHODS



### 1.2.3 - Working area

From a structural point of view, the working area consists of all the components required to link the user's device to the horizontal wiring: depending on the different installation architectures, the working area can include telecommunications outlets (TO), multi user telecommunications outlet assemblies (MUTOA), the consolidation point (CP), the transition point (TP) and the connection cord of the device. All these components help to improve the wiring of an area that is generally problematic as it is subject to numerous structural, environmental and topological constraints, and also potentially subject to change, being moved, reorganisation of the areas, etc. The working area wiring must be freely adaptable to suit different and changing situations. Components such as the multi user telecommunications outlet assembly (MUTOA) and the consolidation point have been introduced to deal with just such requirements. A MUTOA device brings together several users' data sockets in a single point. These users can position themselves anywhere within a relatively large radius, the only limit being that of the maximum length of the device's cord, which is 20 m.
The introduction of the CP (consolidation point) is another technique which provides some freedom for reconfiguring the area. The floor wiring is subdivided into two main parts: the fixed (or permanent) wiring which runs from the technical room to a predefined location in the area to be served and is not modified over time, and a reconfigurable part from the CP which links the telecommunications outlets (TO). If the layout of the office is changed, all that needs to be changed is the last portion of the wiring without having to to anything to the whole of the section, which would require work that would doubtless be more complex and more costly.

**NOTES**:

Various definitions used in this document are listed below.
- WA - Working Area. This is the area in which the work is carried out and where the user interacts with the data and telephone systems, computers, printers, faxes, etc.
- TO - Telecommunications Outlet. This is the telephone socket in each working area. The user can plug his/her devices into this in order to access services.
- MUTOA - Multi User Telecommunications Outlet Assembly. This is a multiple data socket which can serve several users.
- TR - Telecommunications Room. This is the technical room containing the enclosures with the panels and devices for the floor wiring.
- FD - Floor Distributor. This is the floor enclosure located in the TR. It is the neutral point of the horizontal wiring where all the cables from the user workstations converge and from which the connections for the vertical wiring depart.
- ER - Equipment Room. This is the building's technical room in which the central network devices and the enclosures for the building's (vertical) wiring are located.
- BD - Building Distributor. This is the building enclosure located in the ER. It is the neutral point of the vertical wiring where all the cables from the various FD (floor distributors) converge and from which the connections for the campus wiring (if there are any) depart.
- CD - Campus Distributor. This is the campus enclosure, located in the main ER. It is the neutral point of the campus wiring where all the cables from the various BD (building distributors) converge.
- CP - Consolidation Point. This is a zone box which links the floor distributor (FD) to the telecommunications outlet (TO).

### 1.2.4 - Horizontal wiring

Horizontal wiring comprises all the components used to transport information from the user's IT structures to the floor distributor contained in the TR for this wiring branch. The working area wiring is therefore part of the horizontal wiring, which comprises:
- The device cords
- The telecommunications outlet
- The cable
- A possible CP (consolidation point) or the TP
- The patching systems which make up the floor distributor (FD)
- The patch cords
- The device cables

The horizontal wiring is the most critical part of the whole structured cabling system. Firstly, it is structurally complex and includes a large number of cables which must reach various distributed points in a more or less uniform way over quite large areas. Secondly, it is the part of the wiring that is most subject to modification and being moved over time. The technological choices made and the attention given to the infrastructure project supporting this part of the installation will be very important in terms of performance levels and overall cost of the system.

### 1.2.5 - Vertical wiring

The vertical wiring represents the upper levels of the hierarchical structure described in section 1.2.1. The system which links the floor distributors (FD) on the various floors to the building distributor (BD) is generally referred to as the building backbone. Likewise the campus backbone links the various BDs to the CD (campus distributor). This backbone is generally made up of structures for transporting cables between isolated buildings within complexes that are sometimes huge.
These descriptions refer in all cases to typical situations: in reality, each application can differ, often quite considerably, from this general description.
Vertical wiring presents very different installation problems from those of horizontal wiring.
The topology is simpler, and the wiring runs to and from different points. It is easier to create the service spaces in the structure through which to run the cables. The cable runs are not affected by expansion of the network and any updates, modifications, extensions,etc. However the installation of backbones requires the application of special techniques, for both copper and fibre optic cables, whether indoor vertical wiring or campus vertical wiring running outside buildings is involved. In addition, the reliability of the work carried out is particularly critical as each cable is not just associated with a single user but with all the users on a floor, in the wing of a building, in a whole building or even a group of buildings, depending on the hierarchical level of the network structure in question.

### 1.2.6 - Technical rooms

The telecommunications rooms (TR) and equipment rooms (ER) are technical rooms, i.e. areas designed to contain structured cabling equipment and devices. The difference between TR and ER is essentially connected with their hierarchical positions in the wiring structure. A telecommunications room (TR) is the point at which all the cables from the floor wiring converge and from which the vertical wiring cables depart. It contains the hardware structures for patching (panels, patch cords, etc.), the floor distributor (FD), the active network devices and those required for telecommunications. The equipment room (ER) is intended to serve an entire building or group of buildings: it is therefore the room in which all the interconnections are made in the hierarchical layout of the vertical wiring. It contains the hardware structures for termination and patching (BD and CD) and the active devices. In view of the "hierarchical" position of the equipment room (ER) and the complexity, costs and critical nature of all the devices it contains, an ER project must meet very stringent requirements and comply with very strict rules.

## 1.3 - Performance of the wiring system: classes and categories

Now let's take a look at the problem of performance levels, i.e. technological compliance with the intended function of the wiring. The task of each wiring structure is to transport data encoded according to a given protocol.

The need to exchange data ever more quickly necessitates upgrading of the protocols.

If we just look at Ethernet protocols (the most widely used), it will be seen that whereas the transmission speed of the first wiring systems was 10 Mbps, today's network performance is now a thousand times faster, at around 40 Gbps. In the following sections we will describe the essential parameters for defining performance levels.

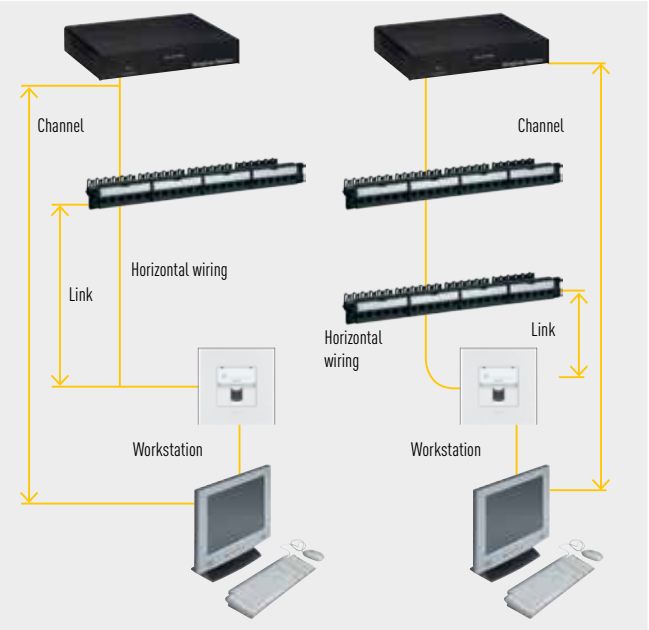
### 1.3.1 - Bandwidth

When describing the performance of a wiring system, irrespective of the technology used for the transport medium, whether it is copper or a wireless system, reference is always made to its bandwidth, expressed in Hertz (its multiples, MHz and GHz). The bandwidth represents the frequency range within which the system operates. A series of electrical parameters is defined within this range, with specific limits given in the reference standards (eg: EN 50173 series).

The performance of a wiring system can be expressed according to a division into classes (according to the ISO/IEC, CENELEC and CEI standards) or categories (TIA/EIA standard).

The category is a parameter which identifies the characteristics of each component in the wiring system. The class identifies the expected performance levels of the system, once all the components have been cabled. The class is checked by means of tests using instruments. These tests must be carried out:

- On the link: fixed horizontal part of the wiring system. The portion from the patch panel to the connector at the workstation
- On the channel: portion which, as well as the link, also includes the patch cords (between patch panels) and the connection to the peripheral at the workstation.



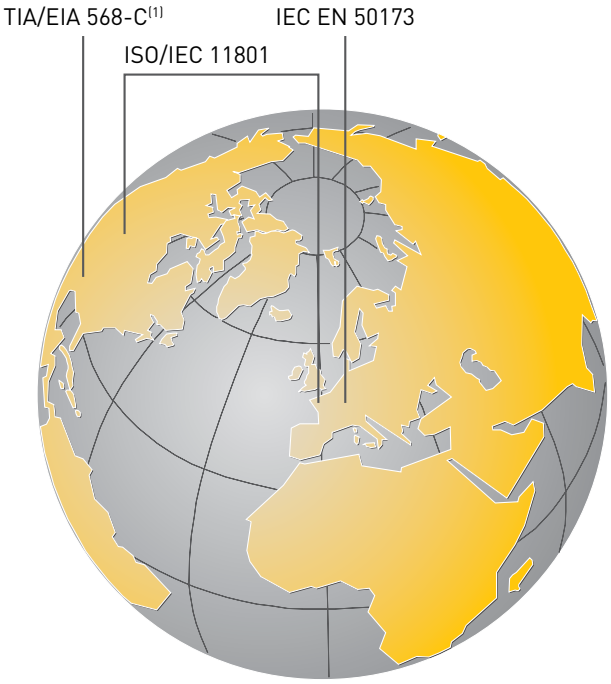

| Class | Category | Speed* | Bandwidth | Applications |
|---|---|---|---|---|
| A | 1 | | 100 KHz | no longer used |
| B | 2 | | 1 MHz | no longer used |
| | 3 | | 10 MHz | no longer used |
| C | 3 | | 16 MHz | no longer used |
| D | 5 | 1 Gbps | 100 MHz | data |
| E | 6 | 1 Gbps | 250 MHz | broadband data |
| EA | $6_A$ | 10 Gbps | 500 MHz | broadband data |
| F | 7 | 10 Gbps | 600 MHz | broadband data |
| FA | $7_A$ | 10 Gbps | 1000 MHz | broadband data |
| Optical | | ≥ 40 Gbps | 2 GHz | broadband data |

# 2 STANDARDS

## 2.1 - General

The reference standards for structured cabling include the design and installation of the overall system and the technical characteristics of each component. The standards are structured differently for each continent, but they all cover all the important topics.
The standards include requirements in terms of:
- Performance
- Safety
- Conformity of the installation

The main reference standards for wiring mainly contain performance requirements and are listed below:
- United States: TIA/EIA 568- C[1]
- Europe: EN 50173 (project), EN 50174 (planning and installation)
- Rest of the world: ISO/IEC 11801 (project) and other standards on specific topics (see 2.4)




[1] The TIA/EIA 568-C series supersedes the previous TIA-EIA 568-A and 568-B series. The contents of the previous series are however kept and incorporated with new requirements. References to the previous series A and B that can be found in the technical literature, although not stringent, must however be considered as still valid.

**Other important standards:**

Safety:
- United States: NEC - National Electrical Code
- Europe: HD 60364 series
- Rest of the world: IEC 60634 series
- Italy CEI 64-8.

Fire resistance (properties of the materials used for cable sheaths):
- IEC 60332-1, 2: flame propagation (single cable)
- IEC 60332-3: fire propagation (cable bundle)
- IEC 60331: integrity of the service under fire conditions (single cable).

All these standards impose various levels of tests in terms of severity and specifications for the cable type (copper, fibre optic, etc.).
Smoke emission (LS), and irritant and corrosive substances (ZH):
- IEC 61304-1, 2
- CEI 20-38.

Properties of the sheaths of fibre optic cables, with regard to its installation:
- Indoor (liquid tight, IEC 60974-2)
- Outdoor (cables not attached, IEC 60974-3).

# 2.2 - ISO/IEC, IEC (rest of the world)

## 2.2.1 - ISO/IEC standards for structured cabling in general

11801: International standard ISO/IEC 11801 defines the specific requirements for the design of the structured cabling system in each of the installation areas listed in the European standards.

In future, it is planned to have a subdivision in the international standards similar to that in the European standards.

International standard ISO/IEC 14763-2 defines the installation, planning, management and maintenance rules for wiring.

ISO/IEC 14763-3: Testing of fibre optic cabling.

## 2.2.2 - IEC standards for cabling components

**Copper cables for horizontal wiring:**

| Wiring class | Cable category | Maximum frequency (MHz) | Standard | Type of cable |
|---|---|---|---|---|
| **D** | 5 | 100 | IEC 61156-5 | Shielded |
| **D** | 5 | 100 | IEC 61156-5 | Unshielded |
| **E** | 6 | 250 | IEC 61156-5 | Shielded |
| **E** | 6 | 250 | IEC 61156-5 | Unshielded |
| **$E_A$** | $6_A$ | 500 | IEC 61156-5 | Shielded |
| **$E_A$** | $6_A$ | 500 | IEC 61156-5 | Unshielded |
| **F** | 7 | 600 | IEC 61156-5 | Shielded* |
| **$F_A$** | $7_A$ | 1000 | IEC 61156-5 | Shielded* |

* Categories 7 and $7_A$ shielded cable only, with pairs shielded individually

**Copper cords:**

| Wiring class | Cable category | Maximum frequency (MHz) | Standard | Type of cable |
|---|---|---|---|---|
| **D** | 5 | 100 | IEC 61156-6 | Shielded |
| **E** | 6 | 250 | IEC 61156-6 | Shielded |
| **E** | 6 | 250 | IEC 61156-6 | Unshielded |
| **$E_A$** | $6_A$ | 500 | IEC 61156-6 | Shielded |
| **$E_A$** | $6_A$ | 500 | IEC 61156-6 | Unshielded |
| **F** | 7 | 600 | IEC 61156-6 | Shielded* |
| **$F_A$** | $7_A$ | 1000 | IEC 61156-6 | Shielded* |

* Categories 7 and $7_A$ shielded cable only, with pairs shielded individually

**FIBRE OPTIC CABLES: CONFORMING TO THE EUROPEAN STANDARD**

**FIBRE OPTIC CORDS: CONFORMING TO THE EUROPEAN STANDARD**

**COPPER CONNECTORS: CONFORMING TO THE EUROPEAN STANDARD (IEC 60603-7 SERIES + IEC 61076-3-104)**

**FIBRE OPTIC CONNECTORS: CONFORMING TO THE EUROPEAN STANDARD**

# 2.3 - TIA/EIA (United States)

The American standards are, in the strict sense, national standards and are therefore applicable to a given area. In the specific field of structured cabling, they are the latest standards, and thus often the only reference in existence for the most innovative solutions, or are quoted in all cases as a reminder.

The ISO/IEC and EN standards often inherit their content at a later stage and do not always correspond with them 100%.

The TIA/EIA 568-C series specifies the minimum requirements for wiring in individual commercial buildings or in complexes. It specifies the physical, electrical and transmission requirements, the maximum possible lengths and the characteristics of the components. The wiring systems described cover a maximum distance of 3000 m and areas of approximately 1,000,000 m², with connection of up to 50,000 users.

The TIA/EIA 568-C series supersedes the previous TIA/EIA 568-B series, adopting its content and incorporating it in that of class $E_A$ which is designated category $6_A$ in American territory (different notation: capital "A" and same term as that used for the requirements for conduits, links and components). To be more precise, the requirements relating to class $E_A$/category $6_A$ are not completely equivalent: those in the TIA/EIA series are less restrictive.

## 2.3.1 - TIA/EIA standards for structured cabling in general

Project
TIA/EIA 568-C.0: Structured cabling, general principles.
TIA/EIA 568-C.1: Requirements specific to wiring in commercial premises and offices.
TIA/EIA 570-B: Requirements specific to wiring in residential environments.
TIA/EIA 942-A: Infrastructure requirements for data centers.
TIA/EIA 1005: Infrastructure requirements for industrial premises.
TIA/EIA 1179: Structured cabling for hospital environments Planning and installation.
TIA/EIA 569-C: Cable pathways and spaces.
TIA/EIA 606-A: Cable routing.
TIA/EIA 607/B: Requirements specific to earthing.

## 2.3.2 - TIA/EIA standards for wiring components

TIA/EIA 568-C.2: Components for copper wiring.
TIA/EIA 568-C.3: Components for fibre optic wiring.

# 2.4 - CENELEC (EUROPE)

## 2.4.1 - Cenelec standards for structured cabling in general

The Cenelec standards define the requirements for the structured cabling system, in particular:
- Class (D, Ex, Fx - copper; OF-l - fibre optic): transmission requirements for a channel or a permanent link
- Category (5e, 6x, 7x - copper; Oxy - fibre optic): transmission requirements for components (cables, connectors and cords)

The standards define "reference layouts" with correspondence between the class of the channel and the component category. For example: a reference layout for a class E channel can certainly be created using category 6 components. The same channel can, however, be created differently: using higher category components, and also lower category components (by reducing the length).
The standards specifically relating to wiring are then subdivided into design, installation, planning and component standards, as specified below.

### EN 50173

The EN 50173 series defines the design requirements for copper and fibre optic structured cabling systems in various different installation areas.
EN 50173-1: Definitions and general characteristics
EN 50173-2: Specific requirements for offices and commercial sites
EN 50173-3: Specific requirements for industrial environments
EN 50173-4: Specific requirements for residential environments
EN 50173-5: Specific requirements for data centers

### EN 50174

The EN 50174 series contains the practical installation requirements for copper and fibre optic structured cabling systems, in particular:
EN 50174-1: Planning, management and maintenance
EN 50174-2: Installation inside standard buildings and specific information for commercial, residential, industrial and data center buildings: backbones and horizontal wiring
EN 50174-3: Installation outside buildings.

### EN 50310

Standard EN 50310 defines the specific requirements for earthing a structured cabling system.

### EN 50346

Standard EN 50346 contains the requirements in terms of methods and instruments for testing both copper and fibre optic structured cabling.

## 2.4.2 - Cenelec standards for the wiring components

The European standards on wiring components are included in the system standards (inherent in section 2.3.1) and define the transmission requirements that must be met by each device in order to constitute transmission channels that comply with them.

### Copper cables for horizontal wiring

| Wiring class | Cable category | Maximum frequency (MHz) | Cable standard | Type of cable |
|---|---|---|---|---|
| **D** | 5 | 100 | EN 50288-2-1 | Shielded |
| **D** | 5 | 100 | EN 50288-3-1 | Unshielded |
| **E** | 6 | 250 | EN 50288-5-1 | Shielded |
| **E** | 6 | 250 | EN 50288-6-1 | Unshielded |
| **$E_A$** | $6_A$ | 500 | (TIA/EIA 568-C.2); EN 50288-10-1 | Shielded |
| **$E_A$** | $6_A$ | 500 | (TIA/EIA 568-C.2); EN 50288-11-1 | Unshielded |
| **F** | 7 | 600 | EN 50288-4-1 | Shielded* |
| **$F_A$** | $7_A$ | 1000 | EN 50288-9-1 | Shielded* |

* Categories 7 and $7_A$ shielded cable only, with pairs shielded individually

### Copper cords

| Wiring class | Cable category | Maximum frequency (MHz) | Cable standard | Type of cable |
|---|---|---|---|---|
| **D** | 5 | 100 | EN 50288-2-2 | Shielded |
| **D** | 5 | 100 | EN 50288-3-2 | Unshielded |
| **E** | 6 | 250 | EN 50288-5-2 | Shielded |
| **E** | 6 | 250 | EN 50288-6-2 | Unshielded |
| **$E_A$** | $6_A$ | 500 | (TIA/EIA 568-C.2); EN 50288-10-2 | Shielded |
| **$E_A$** | $6_A$ | 500 | (TIA/EIA 568-C.2); EN50288-11-2 | Unshielded |
| **F** | 7 | 600 | EN 50288-4-2 | Shielded* |
| **$F_A$** | $7_A$ | 1000 | EN 50288-9-2 | Shielded* |

* Categories 7 and $7_A$ shielded cable only, with pairs shielded individually

### Fibre optic cables for horizontal wiring: type of fibre + location of the cable (indoor or outdoor)

| Channel class | Mode/window (nm) | Type of fibre (equiv. category) | Reference standard |
|---|---|---|---|
| **OF-25** | M/650; | OP1 | EN 60793-2-40 (A4a.2) |
| **OF-50** | M/650; M/850; M/1300 | OP1; OP2 | EN 60793-2-40 (A4a.2; A4g) |
| **OF-100** | M/650; M/850; M/1300 | OP1; OP2 | EN 60793-2-40 (A4a.2; A4g) |
| **OF-100** | M/850 | OH1 | EN 50793-2-30 (A3c) |
| **OF-100** | M/850; M/1300 | OM1 | EN 60793-2-10 (A1a) + EN 60794-2 (ind.), EN 60794-3 (out.) |
| **OF-100** | M/850; M/1300 | OM2 | EN 60793-2-10 (A1b) + EN 60794-2 (ind.), EN 60794-3 (out.) |
| **OF-100** | M/850; M/1300 | OM3 | EN 60793-2-10 (A1a.2) + EN 60794-2 (ind.), EN 60794-3 (out.) |
| **OF-100** | M/850; M/1300 | OM4 | EN 60793-2-10 (A1a.3) + EN 60794-2 (ind.), EN 60794-3 (out.) |
| **OF-200** | M/650; M/850; M/1300 | OP2 | EN 60793-2-40 (A4f) |
| **OF-200** | M/850 | OH1 | EN 50793-2-30 (A3c) |
| **OF-300** | M/850; M/1300; S/1310; S/1550 | OM1 | EN 60793-2-10 (A1a) + EN 60794-2 (ind.), EN 60794-3 (out.) |
| **OF-300** | M/850; M/1300; S/1310; S/1550 | OM2 | EN 60793-2-10 (A1b) + EN 60794-2 (ind.), EN 60794-3 (out.) |
| **OF-300** | M/850; M/1300; S/1310; S/1550 | OM3 | EN 60793-2-10 (A1a.2) + EN 60794-2 (ind.), EN 60794-3 (out.) |

**Fibre optic cables for horizontal wiring: type of fibre + location of the cable (indoor or outdoor) (continued)**

| Channel class | Mode/window (nm) | Type of fibre (equiv. category) | Reference standard |
|---|---|---|---|
| **OF-300** | M/850; M/1300; S/1310; S/1550 | OM4 | EN 60793-2-10 (A1a.3) + EN 60794-2 (ind.), EN 60794-3 (out.) |
| **OF-300** | M/850; M/1300; S/1310; S/1550 | OS1 | EN 50793-2-50 (B1.3, B6.a) + EN 60794-2 (ind.), EN 60794-3 (out.) |
| **OF-300** | M/850; M/1300; S/1310; S/1550 | OS2 | EN 50793-2-50 (B1.3, B6.a) + EN 60794-2 (ind.), EN 60794-3 (out.) |
| **OF-2000** | M/850; M/1300; S/1310; S/1550 | OM1 | EN 60793-2-10 (A1a) + EN 60794-2 (ind.), EN 60794-3 (out.) |
| **OF-2000** | M/850; M/1300; S/1310; S/1550 | OM2 | EN 60793-2-10 (A1b) + EN 60794-2 (ind.), EN 60794-3 (out.) |
| **OF-2000** | M/850; M/1300; S/1310; S/1550 | OM3 | EN 60793-2-10 (A1a.2) + EN 60794-2 (ind.), EN 60794-3 (out.) |
| **OF-2000** | M/850; M/1300; S/1310; S/1550 | OM4 | EN 60793-2-10 (A1a.3) + EN 60794-2 (ind.), EN 60794-3 (out.) |
| **OF-2000** | M/850; M/1300; S/1310; S/1550 | OS1 | EN 50793-2-50 (B1.3, B6.a) + EN 60794-2 (ind.), EN 60794-3 (out.) |
| **OF-2000** | M/850; M/1300; S/1310; S/1550 | OS2 | EN 50793-2-50 (B1.3, B.6a) + EN 60794-2 (ind.), EN 60794-3 (out.) |
| **OF-5000** | S/1310; S/1550 | OS2 | EN 50793-2-50 (B1.3) + EN 60794-2 (ind.), EN 60794-3 (out.) |
| **OF-10000** | S/1310; S/1550 | OS2 | EN 50793-2-50 (B1.3) + EN 60794-2 (ind.), EN 60794-3 (out.) |

P: Plastic; M: Multimode "100% silica"; S: Singlemode "100% silica"; H: Hybrid singlemode (plastic sheath + glass core)

**Fibre optic cords:**

- 100% silica: General specifications EN 60794-1-1 + EN 60794-1-2 + specific requirements for the cable + standards for the connectors used
- Plastic: standards under consideration
- Hybrid: standards under consideration

**Copper connectors:**

| Category | Standard |
|---|---|
| **5/unshielded** | EN 60603-7-2 |
| **5/shielded** | EN 60603-7-3 |
| **6/unshielded** | EN 60603-7-4 |
| **6/shielded** | EN 60603-7-5 |
| **$6_A$/unshielded** | EN 60603-7-41 |
| **$6_A$/shielded** | EN 60603-7-51 |
| **7 (shielded only)** | EN 60603-7-7; EN 61076-3-104 |
| **$7_A$ (shielded only)** | EN 60603-7-71; EN 61076-3-104 |

**Fibre optic connectors:**

There are different types of fibre optic connector according to the type of fibre (100% silica, hybrid, plastic, step index, graded index, etc.) and the mechanical connection (by switch, PC) or angled connection (APC).

All types of connector must comply with the:

- Safety requirements in standard EN 60825-1
- Colour codes in standard EN 60794-2, to prevent any connection errors with different mode cables

Comply with the physical requirements listed in the following table (source EN 50173-1).

## SC PC Multimode

| No. | Characteristics | | Specification | Reference |
|---|---|---|---|---|
| a) | Characteristics in terms of optical performance | | | |
| | Maximum attenuation | Connectors | 0.5 dB for 95% of the connections<br>0.75 dB for 100% of the connections | EN 61300-3-4 |
| | | Joint | 0.2 dB | EN 61300-3-4 |
| | Maximum return loss | Multimode | 20 dB | EN 61300-3-6 |
| b) | Physical characteristics | | | |
| | Compatibility of the termination with the cable | | | |
| | Nominal diameter of the sheath (µm) | | 125 | EN 60793-1-20 |
| | Nominal diameter of the secondary coating (µm) | | - | EN 60794-1-1 |
| | Outer diameter of the cable (µm) | | - | EN 60794-1-1 |
| c) | Mechanical characteristics | | | |
| | Resistance to wear (duration) cycles | | ⩾ 500 (see NOTE 1) | EN 61300-2-2 |
| | Strength of the coupling mechanism | | 68.6 N | EN 61300-2-6 |
| | Tension on the cable | | 90 N | EN 61300-2-4 |
| d) | Environmental specifications | | | |
| | Cold | | -10°C 96 h (see NOTE 1) | EN 61300-2-17 |
| | Dry heat | | 60°C 96 h (see NOTE 1) | EN 61300-2-18 |
| | Damp heat | | 40°C, 93% RH 96 h (see NOTE 1) | EN 61300-2-19 |
| | Impact | | 1 m 5 times (see NOTE 1) | EN 61300-2-12 |
| | Vibration | | 10 Hz to 55 Hz 0.75 mm<br>30 min in each of the 3 directions<br>(see NOTE 1) | EN 61300-2-1 |
| | Change of temperature test | | +60°C/-10°C at a rate of 1°C/min<br>30 min at extremities 5 cycles<br>(see NOTE 1) | EN 61300-2-22 |

**NOTE 1** Maximum variation during the test ‹ 0.2 dB, initial and final attenuation ‹ 0.75 dB
**NOTE 2** Initial and final attenuation ‹ 0.75 dB
**NOTE 3** Maximum variation during the test ‹ 0.5 dB, initial and final attenuation ‹ 0.75 dB

### The most common mechanical types are:

**LC**

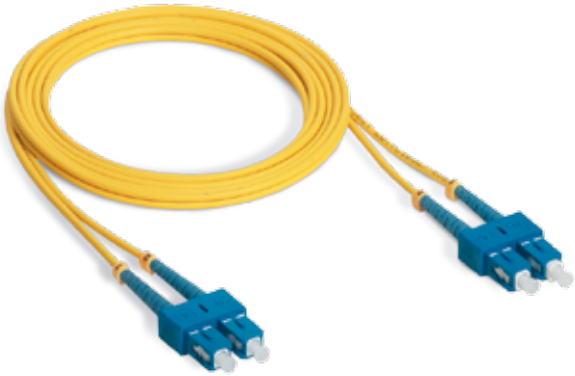
Clip locking

**SC**

Push-pull locking

**LC Duplex**

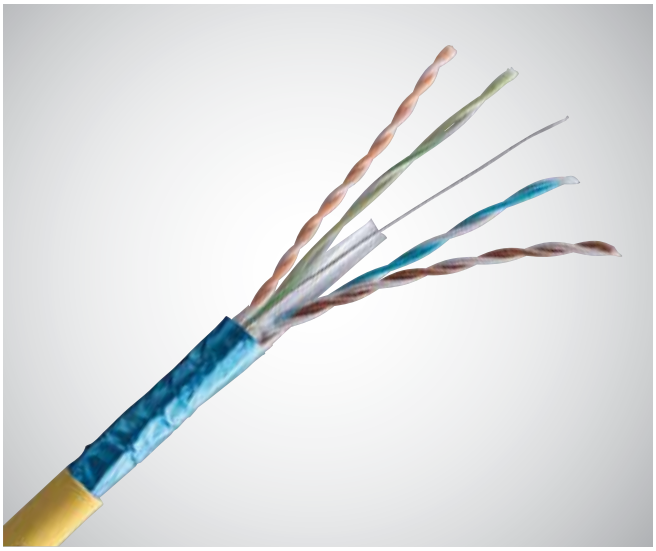
**SC Duplex**



There are then connectors with 12 or 24 fibres (MPO) for the most advanced applications (10GbaseT, and the future 40GbaseT and 100GbaseT).

# 3 COPPER TRANSMISSION MEDIUM

## 3.1 - Cable



The cable is one of the most critical components in horizontal wiring for the performance of the whole link, in terms of both quality of the product and conformity of the installation.

Any cable installation error will seriously compromise the performance of the installation.

For structured cabling systems, the standard requires the use of category 5e, 6 and $6_A$ (100 MHz, 250 MHz et 500 MHz respectively) twisted, symmetrical 4-pair cables with an impedance of 100 Ω 1).

The cable can be of the following type:

- Unshielded U/UTP (Unshielded Twisted Pairs)
- Shielded F/UTP (Foiled Twisted Pairs)
- Double shielding SF/UTP or S/FTP.

NOTE 1): To date, category 7 is not very widely used, even though it is standardised and can offer high performance levels. It is used for reasons of form factor, cost and where there are installation difficulties.

**Legrand cable solutions**

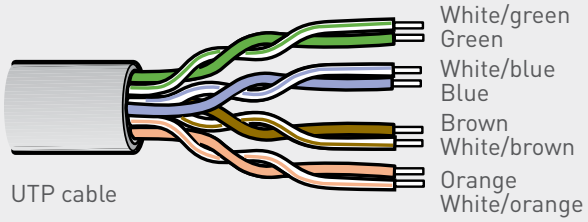
| | Sheath | Marking | Storage/installation temperature | Operating temperature |
|---|---|---|---|---|
| **Cat. $6_A$ F/UTP 100 Ω** | LSZH (zero halogen cables) conforming to standard NFC 32062, flame retardant conforming to standards IEC 332-1 and NFC 32070 2.1 - Ø 7.8 mm - Colour: RAL 1018 yellow | LEGRAND 32778 4 pairs 24 AWG F/UTP 100 ohms LSZH cat. 6a 500 MHz - CHECKED AGAINST ISO 11801 IEC 332-1 EN 50173 - TIA/EIA 568B - VPN/NVP .....% Batch no. + length in metres | 0 to +50°C | -20 to +60°C |
| **Cat. 6 U/UTP 100 Ω** | PVC or LSZH cables conforming to standard NFC 32062, flame retardant conforming to standards IEC 332-1 and NFC 32070 2.1 - Ø 6.4 mm - Colour: RAL 5015 blue | LEGRAND (4 pairs or 2x4 pairs) 24 AWG UTP 100 ohms 250 MHz (PVC or LSZH) cat. 6 250 MHz - CE CHECKED AGAINST ISO 11801 IEC 332-1 EN 50173-1 TIA/EIA 568A Batch no. + length in metres | 0 to +50°C | -20 to +60°C |
| **Cat. 6 F/UTP 100 Ω** | PVC or LSZH cables conforming to standard NFC 32062, flame retardant conforming to standards IEC 332-1 and NFC 32070 water-repellent synthetic tape - Ø 7 mm - Colour: RAL 5015 blue | LEGRAND (4 pairs or 2x4 pairs) 24 AWG FTP 100 ohms 250 MHz (PVC or LSZH) cat. 6 250 MHz - CE CHECKED AGAINST ISO 11801 IEC 332-1 EN 50173-1 TIA/EIA 568A Batch no. + length in metres | 0 to +50°C | -20 to +60°C |
| **Cat. 5e U/UTP 100 Ω** | PVC or LSZH cables conforming to standard NFC 32062, flame retardant conforming to standards IEC 332-1 and NFC 32070 2.1 - Ø 5.2 mm - Colour: RAL 7035 light grey | Cat. No. LEGRAND (4 pairs or 2x4 pairs) 24 AWG UTP 100 ohms (PVC or LSZH) cat. 5e CE CHECKED AGAINST ISO 11801, IEC 332-1, EN 50173-1, TIA/EIA 568A Batch no. + length in metres | -15 to +70°C | +5 to +40°C |

**NOTE:** for all other types of cable, please contact the Legrand sales network

Data transmission cables are made up of four pairs arranged inside a sheath according to a specific layout, which is necessary to reduce attenuation and crosstalk problems. This layout consists of twisting the pairs of conductors individually. These pairs are identified using standard colours. Each of the pairs has a different pitch, and is in turn twisted differently inside the outer sheath. The conductor size permitted by the standards is between 22 and 26 AWG: 24 AWG is the most commonly used in all cases. The acronym AWG (American Wire Gauge) corresponds to the unit of measurement used by the American standards to measure the cross-sections of cables. As it is a ratio, the smallest cross-sections correspond to the largest AWG sizes. The appropriateness of using cables with different types of sheath must be assessed according to the area in which the wiring system is installed. The most commonly used cable sheath is PVC or LSZH (low smoke zero halogen).
According to the IEC and CEI specifications, cables with LSZH sheath must be used:

- In public areas
- In very busy areas
- Installations subject to a final test by public or safety bodies, such as local health authorities and fire services. If there is a fire, cables with this type of sheath emit very little smoke and do not release any toxic gases.

## UTP CABLE




UTP cable

**AWG cable conversion table**

| AWG | Ø (mm) | Cross-section (mm) | AWG | Ø (mm) | Cross-section (mm) |
|---|---|---|---|---|---|
| **1** | 7.250 | 42.400 | **16** | 1.290 | 1.3100 |
| **2** | 6.540 | 33.600 | **17** | 1.150 | 1.0400 |
| **3** | 5.190 | 21.200 | **18** | 1.024 | 0.8230 |
| **4** | 5.190 | 21.200 | **19** | 0.912 | 0.6530 |
| **5** | 4.620 | 16.800 | **20** | 0.812 | 0.5190 |
| **6** | 4.110 | 13.300 | **21** | 0.723 | 0.4120 |
| **7** | 3.670 | 10.600 | **22** | 0.644 | 0.3250 |
| **8** | 3.260 | 8.350 | **23** | 0.573 | 0.2590 |
| **9** | 2.910 | 6.620 | **24** | 0.511 | 0.2050 |
| **10** | 2.590 | 5.270 | **25** | 0.455 | 0.1630 |
| **11** | 2.300 | 4.150 | **26** | 0.405 | 0.1280 |
| **12** | 2.050 | 3.310 | **27** | 0.361 | 0.1020 |
| **13** | 1.830 | 2.630 | **28** | 0.321 | 0.0804 |
| **14** | 1.630 | 2.080 | **29** | 0.286 | 0.0646 |
| **15** | 1.450 | 1.650 | **30** | 0.255 | 0.0503 |

| New ref. | Old ref. | Description |
|---|---|---|
| **U/UTP** | UTP | Unshielded twisted multipair cable |
| **F/UTP** | FTP | Twisted multipair cable (external foil screen) |
| **U/FTP** | FTP PIMF | Shielded twisted multipair cable (foil screened in pairs) |
| **F/FTP** | FFTP | Shielded twisted multipair cable (foil screened in pairs and outer general shielding) |
| **S/FTP** | SFTP | Twisted multipair cable (foil screened in pairs and outer braid) |

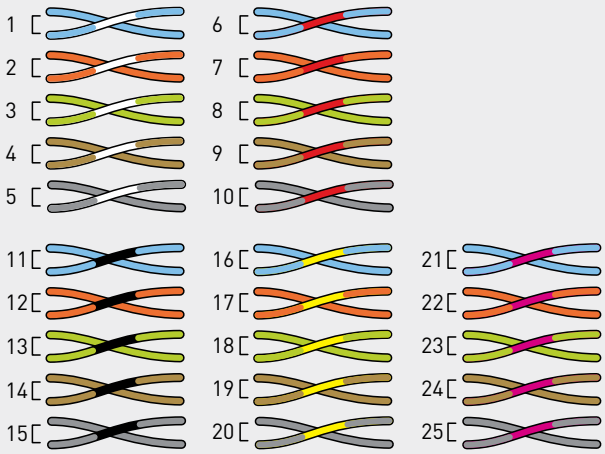
X/XXX

- Symmetrical pair: TP = Twisted pair
- Shielding of pairs U = Unscreened, F = Foil screened in pairs
- External shielding: U = Unshielded, F = Foil screened sheath, S = Braided shielding

### 3.1.1 - Multipair cable

Multipair cables for telecommunications are mainly used to transmit telephone services to the workstation. The cables used are generally made up of 50 and 100 pairs. Cables with larger numbers of pairs should not generally be used. There are also Category 5 multipair cables, generally with 25 and 50 pairs. These cables are normally used for specific solutions, specified by the design office when the project is drawn up. The pairs inside multipair cables are standard colours. The specifications and colour code must be followed when installing 25-pair cables.

## COLOUR CODES OF MULTIPAIR CABLES



# 3.2 - Connectors for workstations

The connectors have the colour codes defined in the standards, according to which a structured cabling system can be installed. These colours are the same as those on 4-pair cables.
A standard installation, which uses 4-pair copper cables, must always be wired with the same sequence of colour codes, irrespective of the application and the type of service for which they are to be used (telephony or data transmission).
Legrand offers two types of connector:
- TOOLLESS connectors (do not require a connection tool)
- Type 110 connectors (require a connection tool)

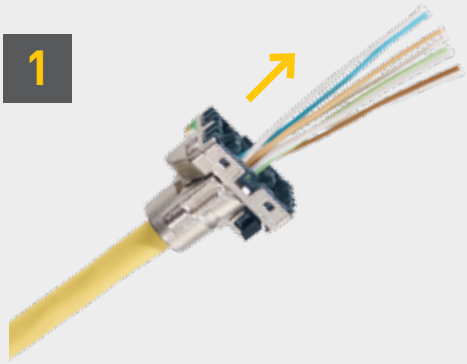
The connectors are available in cat. 5e UTP and FTP, 6 UTP, FTP and STP, $6_A$ UTP and STP, in all wiring device ranges.

## 3.2.1 - Toolless connection

The new TOOLLESS connector is at the heart of the performance of the LCS² system. A perfect connection can be obtained in just a few seconds, giving a link providing excellent performance levels, from the patch panel through to the workstation.

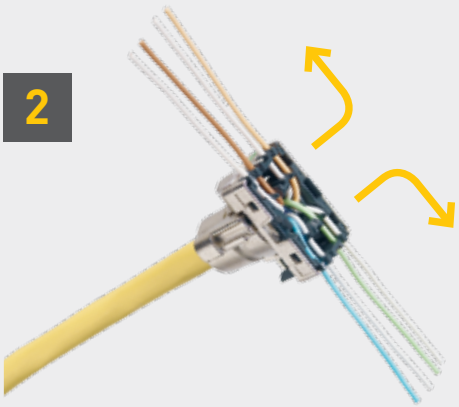
## ASSEMBLY

**1**



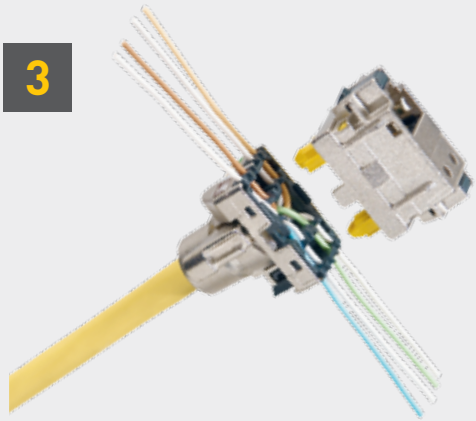
Insert the cable in the connection module.

**2**



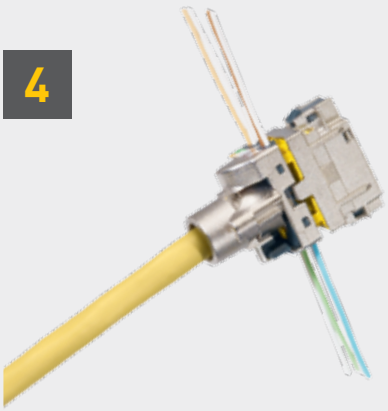
Separate the pairs and insert them in the corresponding locations, complying with the colour code. The module automatically ensures compliance with 13 mm, the cut in the centre and the splitting of the pairs.

**3**



Clip the connector onto the module. The connector helps to ensure correct assembly.

**4**



Turn the ring to complete the connection and cut off any excess cable using wire cutters.

The new TOOLLESS connector for quick, tool-free connection is available in all categories for installation on patch panels and on workstations.
TOOLLESS connectors are coloured so that their category can be easily and safely identified: yellow cat. $6_A$, blue cat. 6, grey cat. 5e.

No tool

$6_A$

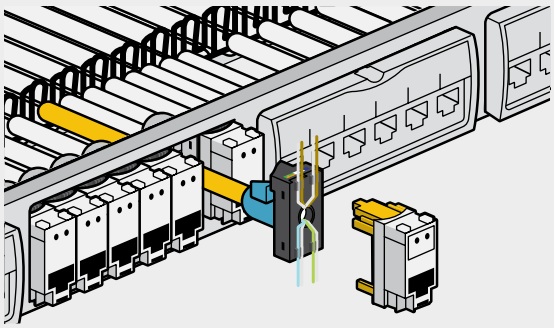
6

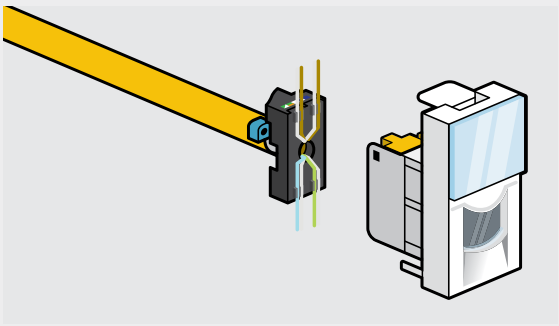
6

5e

## TWO TYPES OF CONNECTOR

Different TOOLLESS connectors are used for the patch panel and the terminal socket: the connection ring on the panel connector is larger to make it easier to use and for repeated installation. The ring is smaller on the module connector so that it is easier to install in a flush-mounting box. The two connectors are not interchangeable.





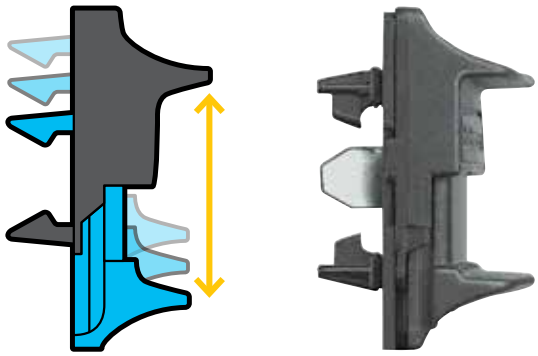
# 3.3 - Patch panels

Patch panels are used to make wiring tidier and reconfigurable. Legrand offers two types of panel:
- Toolless patch panel
- Type 110 patch panel.

The new patch panels have been designed to optimise installation and maintenance: each connector connects individually to a front panel installation. Cable management is also made easier by a cable guide.

The panels are available in their complete versions in cat. $6_A$ STP, cat. 6 UTP, FTP and STP and cat. 5e UTP and FTP, and modular versions with units of six RJ 45 connectors.
The new QUICK-FIX system reduces installation times as no screws are required.


Patch panels with QUICK-FIX screw-free attachment. Full interoperability with other commercially available products.



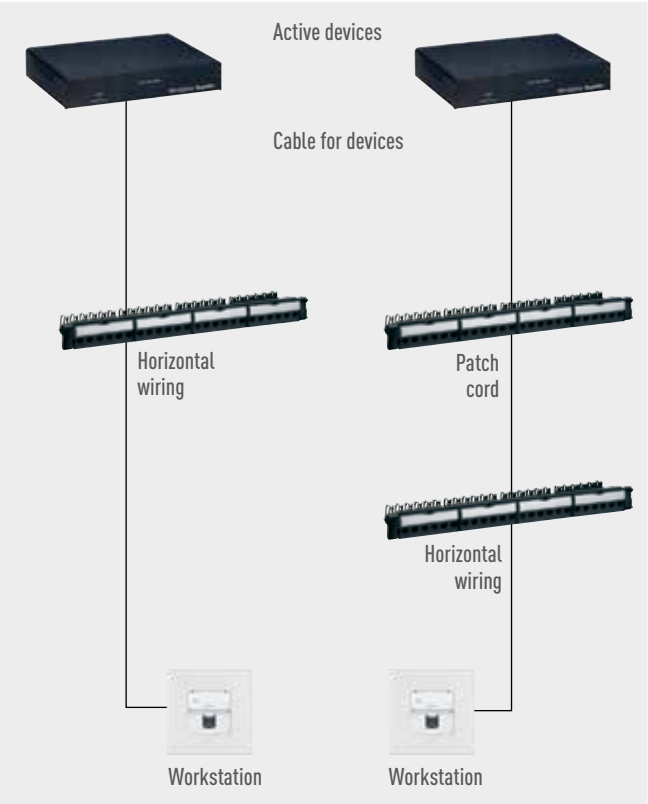
Detail of the mechanical spring for fixing to the upright, with stabiliser

## 3.3.1 - Patching methods

There are two methods for patching in racks: the first, referred to as interconnection, is used for small to medium sized installations, as the active device is reached directly from the patch panel via the corresponding cable. The second method is called cross-connection. Here, patching is not carried out directly on the active device, but between patch panels. The type of patching must be chosen at the project stage.

The panels must be chosen according to the number of distributed ports, and it it standard practice not to saturate them totally. Leave at least 10% free space on the total number of modules connected, to allow for any future extension.

### INTERCONNECTION AND CROSS CONNECTION METHODS



### 3.3.2 - TOOLLESS patch panels

TOOLLESS patch panels use the same connection method as TOOLLESS connectors. The connectors do not require any tools for connecting the cable.
For this solution, Legrand offers a complete range of patch panels:
- Modular patch panels with 24 ports
- Complete patch panels with 24 ports.

### 3.3.3 - Patch panels for keystone

Modular empty panel for 24 unshielded keystone jacks Cat6 and Cat 5e supply with rear plastic support.

### 3.3.4 - Telephone patch panels

The use of patch panels can make it easier to interconnect the different panels. There is a choice of two types of patch panel:
- Type 110 telephone panel
- TOOLLESS telephone panel.

The type 110 telephone panel is available with 50 cat. 3 RJ 45 connectors in a rack unit. As with all 110 connectors, the telephone connectors also require a connection tool for their wiring. The TOOLLESS telephone panel is available with 48 cat. 3 RJ 45 TOOLLESS connectors in a rack unit, with the Quick-Fix system. This type of solution does not require a connection tool for wiring the connectors.

## 3.4 - Patch cords

Measurement of LCS² components and links are validated by independent laboratories 3P Third Party Testing and ETL.

The patch cords must be excellent quality, and the male and female connectors must be electrically and mechanically compatible.
For this reason, compliance with the following recommendations is necessary:
- Only use factory-assembled patch cords
- Do not use horizontal cables to make patch cords yourself
- Test patch cords individually to check their performance, as this is not possible with generally available conventional instruments.

Legrand patch cords are available in various lengths, in categories 5e UTP and FTP, 6 UTP, FTP and STP, and $6_A$ UTP and STP.

# 4 FIBRE OPTIC TRANSMISSION MEDIUM

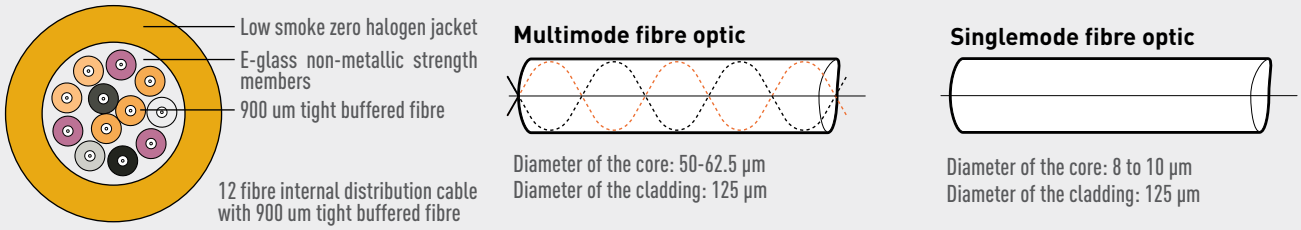
## 4.1 - Cable

The fibre optic is a transmission medium that enables a larger bandwidth to be used than copper cables. With fibre optic cables, transmission is based on the propagation of light pulses, generated by an LED or a laser source in the infrared band, along a glass fibre. Inside an fibre optic, the signal can either be propagated in a straight line, or be reflected many times. Straight line propagation mode is said to be zero order. Singlemode fibres only use one mode to propagate light. The diameter of their cores is between 8 and 10 µm. Multimode fibres allow several propagation modes, and the diameter of their cores is 50 µm or 62.5 µm (the latter is now hardly ever used).
The diameter of the cladding is generally 125 µm. Multimode fibres are used in indoor installations and enable more economical devices to be used. They are however subject to the phenomenon of modal distortion, when the different modes propagate at slightly different speeds, which limits the maximum distance at which the signal can be received correctly.

Singlemode fibres are used in outdoor installations as they can cover much longer distances and reach much higher speeds.
Multimode fibres are divided into two categories: step index and graded index fibres.
Legrand supplies the following fibre optic cable solutions:
- Multimode cables (50/125 microns, 6 to 24 fibres), available in 2000 m reels
- Singlemode cables (9/125 microns, 6 to 24 fibres), available in 2000 m reels

The various types of cable are also available with different types of coating:
- LSZH and/or flame retardant
- Armoured
- Armoured, anti-rodent

### EXPLODED VIEW OF A MULTIFIBRE CABLE CONTAINING 6 SINGLE FIBRES

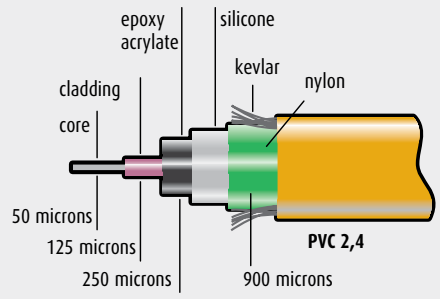



### 4.1.1 - Advantages

Fibre optic have the following major advantages in relation to copper cables:
- Total immunity to electromagnetic interference
- High transmission capacity
- Low attenuation
- Very compact

The use of fibre optic is recommended for vertical wiring. In some situations, it is even possible to run the fibre optic right up to the office (FTTO - Section 7) or to the workstation (FTTD). The presence of fibre optic necessitates the use of devices with optical interfaces.

### DIAGRAM OF A SINGLE FIBRE CABLE



### 4.1.2 - Characteristics

The fibre optic is made of an internal part, called the core, and an external part, called the cladding. The light ray injected at one end of the fibre remains confined between the two layers of material and is guided along the length of the fibre due to the differences in the refraction indexes of the materials from which the core and the cladding are made.
The fibres, which are mechanically very fragile, are covered in the cladding and placed in the fibre optic cables using the most diverse technologies to meet the requirements of different applications.
Fibres are normally identified by the abbreviation 50/125 µm (or 9/125 µm), which indicates that the core is 50 µm and the cladding 125 µm.

### 4.1.3 - Fibre optic backbones

If the application is an Ethernet network, it is advisable to install a cable with at least 6 fibres, two of which will be used for Ethernet transmission, while the other 4 will be for future uses or simply as a back-up. It must be remembered that attaching connectors is one of the most costly elements. This does not not necessarily have to be done at the same time as the fibre is installed for all optical conductors. It is possible to postpone this operation, leaving the fibres free inside the specific unit. Likewise, ascending fibres must be interfaced at an active neutral point (hub or switch) which has optical connections. Inside racks, fibres are connected in a fibre optic drawer with feedthroughs.
This operation requires the same number of feedthroughs as there are fibres.
The fibre optic drawer generally has appropriate protective devices and accessories to prevent the connected fibre being subjected to any mechanical stresses.
The connection is made using small coupling tubes called "splice protection" tubes.

### 4.1.4 - Installing the fibre optic

The fibre optic is installed in different ways depending on the location, the type of fibre and the level of safety required by the end user. The fibre optic must be run in the support infrastructures. As this structure is mainly used for vertical wiring applications which concern two levels, two main connections can be identified.
First level: between the buildings on a campus, and thus in the infrastructures linking the buildings.
Second level: between the floors in a building. The only infrastructure is therefore the cable. They must therefore be pulled in the conduits using the specially inserted Kevlar layer. In installations requiring a high degree of safety, it is recommended that the fibre optic cables are protected by steel conduits.

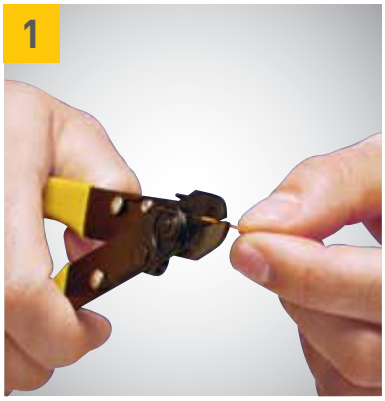
## 4.2 - Fibre optic connectors

Tool case for fibre optic connection

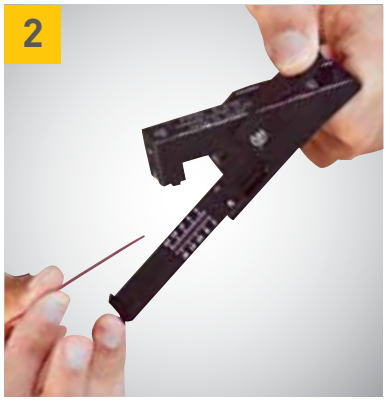
Connectors are attached to the fibre optic by mechanically coupling the two fibres. Passing the light ray from one fibre to the other requires the core to be coupled at both ends of the fibre.
In view of the dimensions of the areas to be coupled, it is clear that the devices for the interconnection must have specific characteristics in terms of quality and precision.
Fibre optic connectors consist of one part called the ferrule, and a support body.
The ferrule is generally made of ceramic or a composite material. It has a hole drilled in its centre and takes the terminal part of the fibre. This terminal part is connected to the ferrule using different technologies (mechanical couplers, heat-cured epoxy resins, infrared sensitive resins, 2-component adhesives, etc.). The head of the ferrule, which contains the termination of the fibre, must therefore be polished until a totally flat surface is obtained. ST (round bayonet connector) and SC (square clip-on connector) connectors are generally used. There are also various new types of connector, for example LC connectors.
These are the latest generation, high density connectors which are very compact in comparison with the traditional SC connectors.
LCS$^2$ fast-connection fibre optic connectors are easy to connect, reliable and robust, and can be re-used up to 5 times. A microswitch is used to make a mechanical connection to lock the fibre inside the connector. There is an illuminated indicator in the connector to check for any connection errors at the end of the process. These connectors do not require any type of adhesive or special tool.
For installing connectors on loose fibre cables (250 µm), use connection kits Cat. Nos. 0 330 48 and 0 330 49.

# 4.3 - Tool case for fibre optic connection

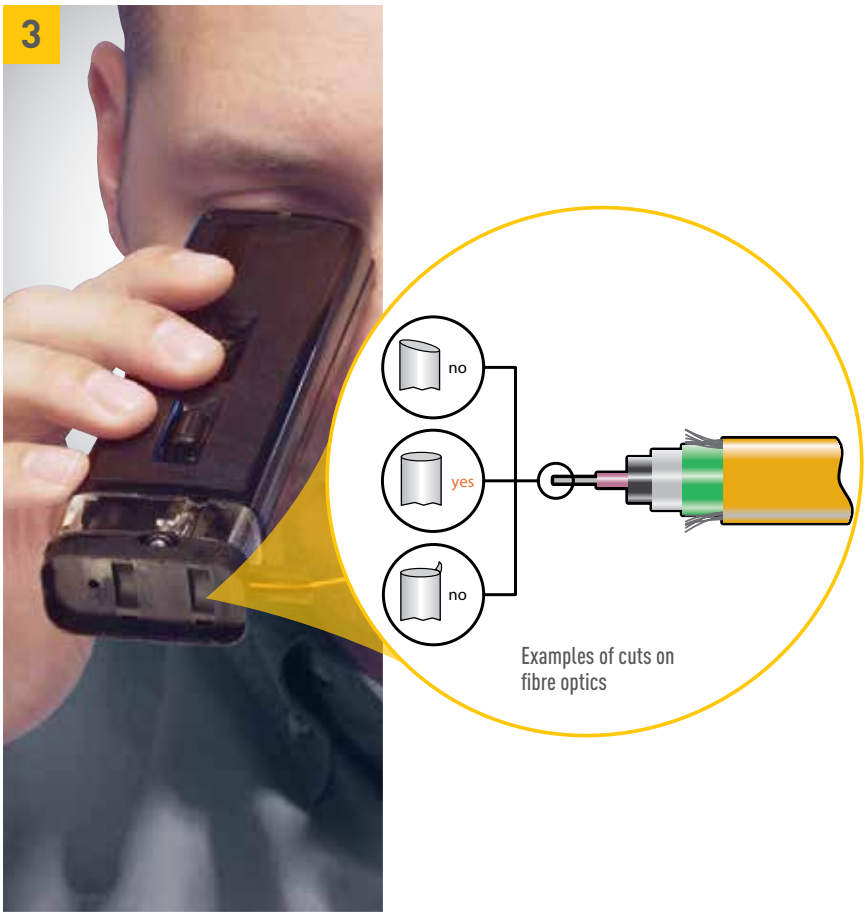
The kit Cat. No. 0 326 90 contains all the tools needed for connecting SC, ST and LC connectors.
A connection takes less than 3 minutes with this kit.




Remove the sheath from the fibre



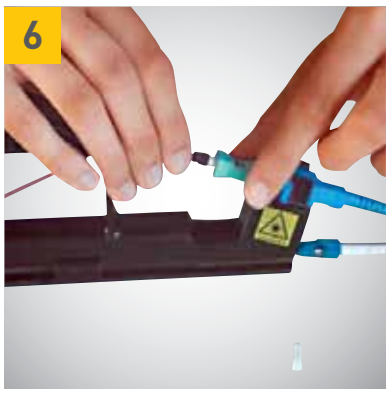

Cut the fibre




Check that the cut is correct


Insert the fibre in the connector


Slide the microswitch on the connector to make the connection




Slide the dust cover into the connector

## 4.4 - Fibre optic feedthrough sockets (connectors)

To make fibre optic connections directly at the workstation (Fibre To The Desk connections), there are ST and SC duplex fibre optic feedthrough sockets and LC fibre optic connectors for workstations in all Legrand wiring accessory ranges.

0 786 16

0 786 17

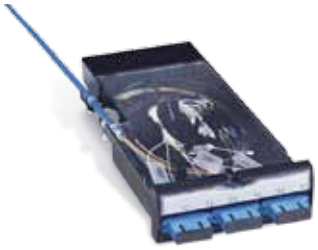
0 786 18

## 4.5 - Fibre optic drawers

The fibre optic drawer is the equivalent of the patch panel for copper cables. Its function is to house all the connectors connected to the fibre optic cable, thus enabling connection to the active devices on the network.
The LCS$^2$ range offers:
- A fibre optic patch drawer Cat. No. 0 355 09 to contain 4 fibre optic units with ST, SC or LC connectors, for a total of 48 fibres
- Fibre optic units for 6 and 12 fibres for mounting on 19" fibre optic drawer Cat. No. 0 355 10

There must be the necessary space for the connected fibres, and occasionally a support to maintain the correct bending radius to ensure insertion of the fibre in the feedthrough socket. This modular solution meets all connection requirements without adversely affecting the performance of the system
- A range of high density fibre optic drawers Cat. Nos. 0 326 40/41/42 which take OM4 and OS1/OS2 cassettes with prefitted connectors with an MTP high density connector and 24 LC or 12 SC outlets at the rear Cat. Nos. 0 325 45/46/47/48.

19" high density fibre optic drawer - 24 OF



High density fibre optic cassette and unit - 6 OF

Fibre optic floor cabinet

Fibre optic units

### Installation recommendations

The fibre optic drawer has accessories for managing the fibre optic, to avoid any excessive mechanical stress. The drawer is supplied with optional accessories to ensure correct management the bending radiuses of pigtails and to protect splices.

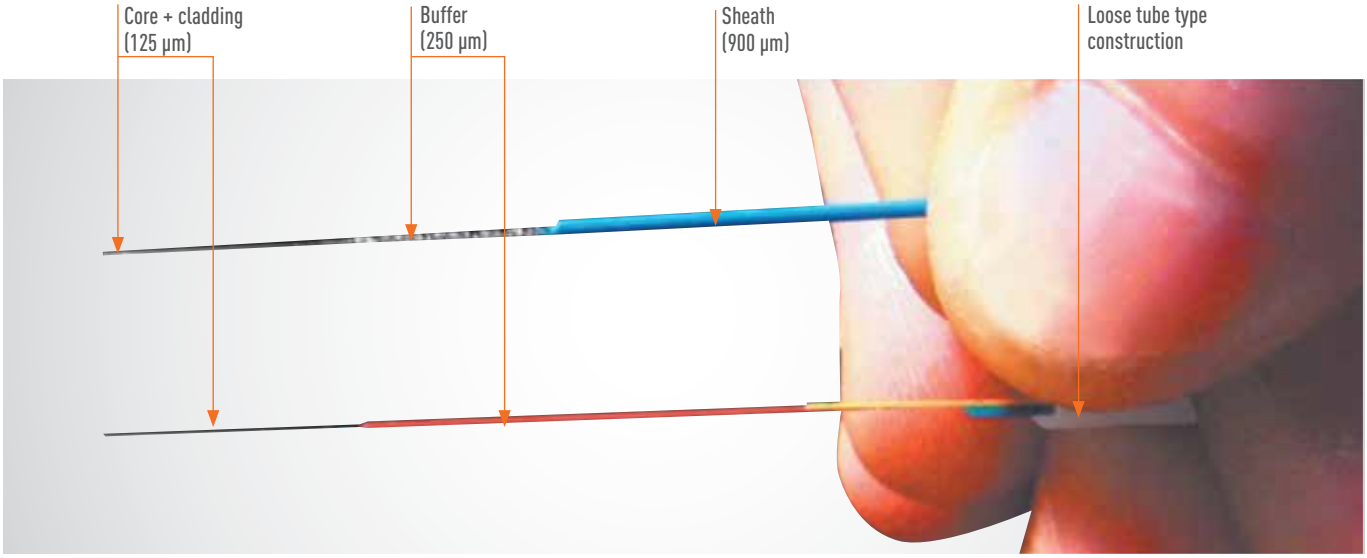
## 4.6 - Patch cords

Fibre optic patch cords perform the same function as copper cords. They are both used to connect fibre optic drawers together, for patching between active devices and fibre optic drawers and for patching at workstations (Fibre To The Desk) with terminals which have inputs for fibre optic.
Legrand offers fibre optic patch cord solutions, both multimode OM2, OM3 and OM4 50/125 µm and singlemode OS1/OS2 9/125 µm, with combinations of SC, ST and LC connectors.

Multimode patch cord OM2 50/125 µm

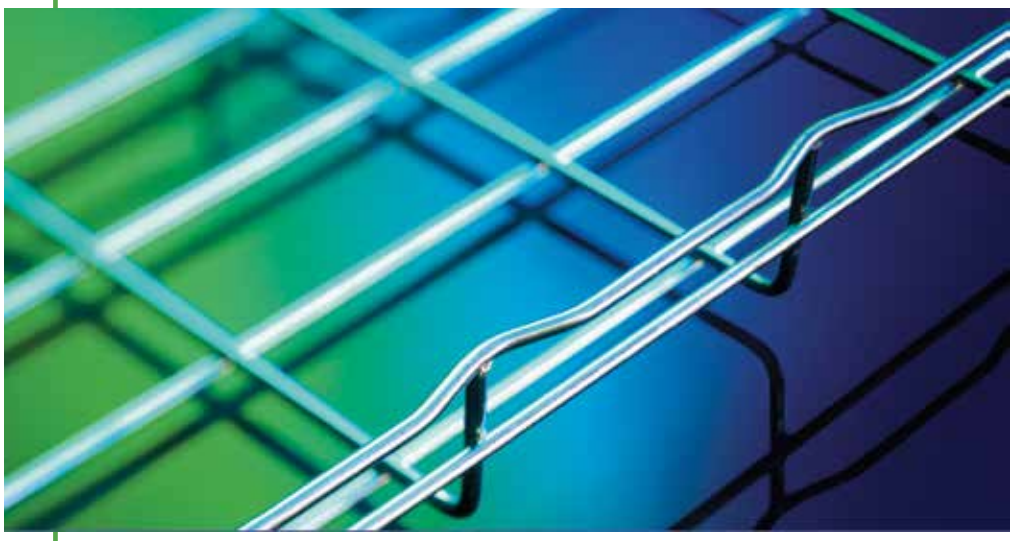
## 4.7 - Connection kit

This is essential for connecting loose structure cables with individual fibres covered by a 250 µm diameter sheath to connectors.



# CABLOFIL®

INNOVATORS IN CABLE MANAGEMENT



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# 5 Wi-Fi TRANSMISSION MEDIUM

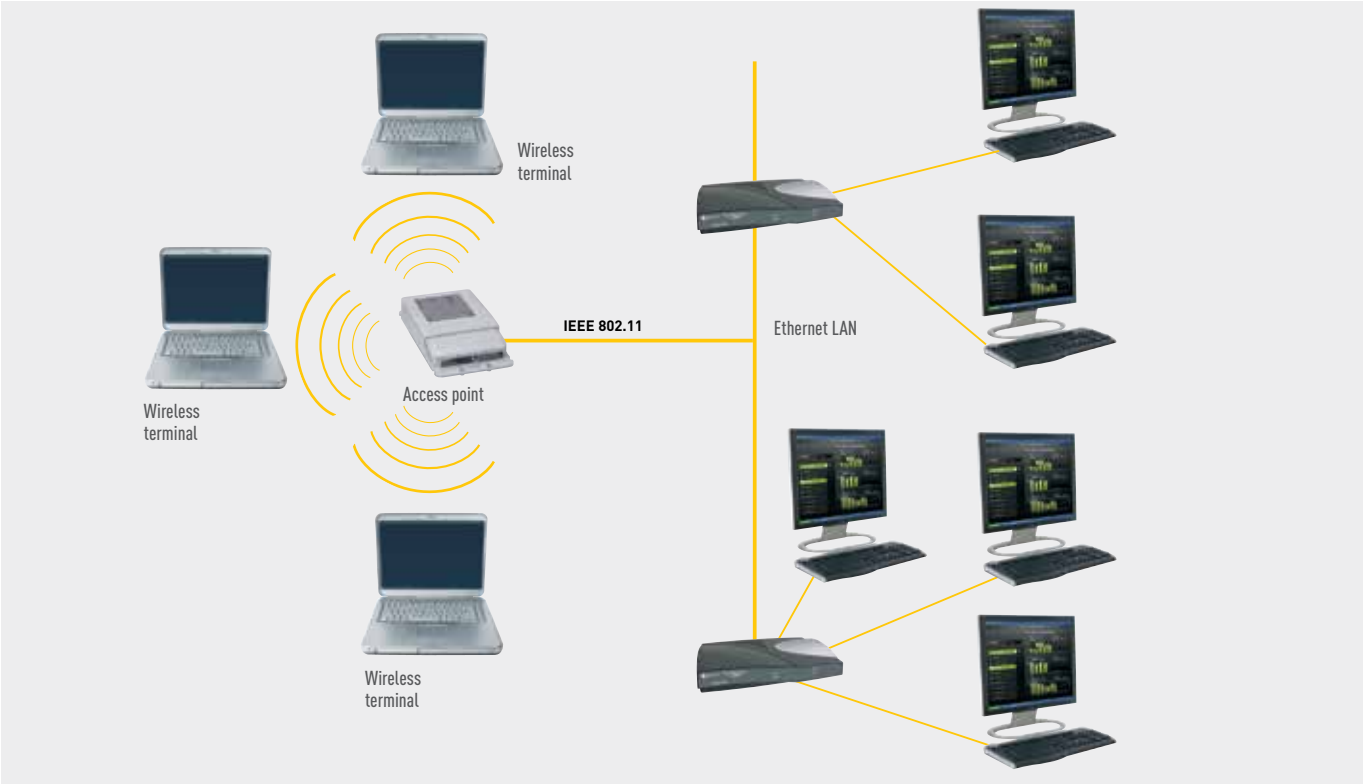
The wireless network is one in which the signal is transmitted by radio waves. No connection cables are necessary.
This gives wireless technology:
- A great deal of flexibility in terms of the positioning of the stations
- A high degree of mobility
- Guaranteed widespread connectivity, even in areas where there is no appropriate wiring structure or where it is not possible to create one.

A network can be accessed wirelessly using a device call an "access point" which is physically connected to the network infrastructure. This access point provides access to one or more "client" devices located in the coverage area of the radio signal created by the access point.
Radio frequency refers to a high frequency alternating signal transmitted along a copper cable which can be transmitted in space via an antenna. The radio waves are propagated in a straight line simultaneously in all directions by the antenna.

## 5.1 - Wireless transmission standard

The body responsible for the standardisation of wireless local area networks is the IEEE (Institute of Electrical and Electronics Engineers) Working Group for wireless LAN, called IEEE 802.11.
The following standards have been established by IEEE 802.11:
- IEEE 802.11 - The initial 2 Mbps, 2.4 GHz standard
- IEEE 802.11a - 54 Mbps, 5 GHz standard (1999, approved in 2001)
- IEEE 802.11b - Enhancement of standard 802.11, supporting 5.5 and 11 Mbps (1999)
- IEEE 802.11e - Enhancement: Quality of service
- IEEE 802.11g - 54 Mbps, 2.4 GHz standard (compatible with 802.11b) (2003)
- IEEE 802.11i (ratified 24 June 2004) - Enhanced security
- IEEE 802.11n ratified 2009 - Enhanced range and bandwidth available due to MIMO technology (up to 300 Mbps with 2 antennae and a 40 MHz channel width).

### WIRELESS LOCAL AREA NETWORKS



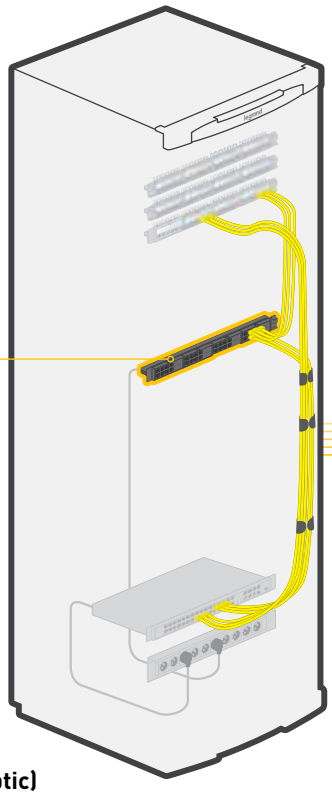
# 5.2 - Components for wireless networks

**Access point**. This is the device that enables a mobile user to connect to a wireless network. The access point is connected to a wired network. It receives or sends (it can communicate by radio in one direction) the radio signal to the users by means of antennae and transmission-reception devices. The access point is the device which communicates with the clients and with other access points. It is connected to the network and also performs all the management, access control, roaming and even security functions.

**Power over Ethernet (PoE) devices**. Devices which receive the power supply via the structured cabling. The DC power supply is provided to an access point directly via the network cable, which performs the dual function of transmitting data and supplying the power. This is very useful when the access point is positioned in a location a long way from a power source or to avoid having to have a local power supply.
The power can be supplied by the network switch. The power supply can also be added to a wiring system by inserting a PoE device supplying power to the free pairs of the network cable.

**Centralised management software**
For centralised management of Wi-Fi access points.

**PoE INJECTOR**
Each PoE unit can manage up to 4 Wi-Fi access points. Can be installed in the patch panel.



**The LCS² offer (copper and fibre optic)**
This comprises:
- Cabinets and panels
- Devices (patching and reels, etc.)
- Sockets: cat. $6_A$, cat. 6 and cat. 5e
- Cables and cords: U/UTP, F/UTP, SF/UTP

**Wi-Fi access points installed in false ceilings or wall-mounted, and controlled remotely (802.11n)**
This enables the network to be extended up to 600 m² free space. Can be installed in the false ceiling or in the wall.
Provides a maximum theoretical speed of 300 Mbps. The network administrator can use the software to manage the network remotely. Security ensured using encryption methods such as WPA 2. Conforms to the 802.11a/b/g/n standards.

**Wi-Fi access points which can be flush-mounted the in Legrand 802.11a/11b/g range of wiring accessories**
To be installed in 4-module flush-mounting boxes. The network administrator can use the software to manage the network remotely. Range 100 m2, ideal for small working areas.

**Connections**
In false ceiling for managed Wi-Fi access points. On the ground for wall-mounted and wired access points and RJ 45 sockets.

**RJ 45 connectors**
For access to the wired distribution system. Available in cat. $6_A$, cat. 6 and cat. 5e.

# 6 HOUSING REQUIREMENTS

Legrand offers a series of solutions for cabinets for structured cabling in commercial buildings, ranging from the main distributor to the floor distributor.

**All products comply with the following standards:**

| | |
|---|---|
| **IEC 60297-3-100 DIN 41414-7** | (NF C 20-150, NF C 20-151). Dimensions of mechanical structures of the 482.6 mm (19 in) series |
| **EIA-310-E** | Cabinets, racks, panels and associated equipment (ANSI/EIA/-310-E-2005) |
| **IEC 60950-1 EN 60950-1 C 77-210-1** | Safety of information technology equipment |
| **IEC 60529** | (NF C 20-010) Degrees of protection provided by enclosures (IP code) |
| **IEC 62262 EN 62262** | (EN 50102, NF C 20-015). Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code) |

**LCS² cabinets can be integrated in installations complying with the following standards:**

| | |
|---|---|
| **ISO IEC 11801** | Information technology - Generic cabling for customer premises |
| **EN 50173-1** | Information technology - Generic cabling systems |
| **EN 50174-1 and 2 C 90-480-1 and 2** | Information technology - Cabling installation |
| **IEC 60364-4-41** | Low voltage electrical installations<br>- Protection for safety<br>- Protection against electric shock |
| **NF C 15-100 Part 4-41** | Low voltage electrical installations - Recommendations |
| **UTE C90-483** | Residential cabling for communication networks |

## 6.1 - LAN requirements

### 6.1.1 - Freestanding cabling cabinets

**General characteristics**

LCS² 19'' freestanding cabinets have been designed to answer to esthetic, easy installation and efficient maintenance needs.

They have a single color finish, Anthracite Grey RAL 7016.

Metallic freestanding cabinets (textured polyester coating) provide excellent resistance to corrosion and scratching.

LCS² 19'' freestanding cabinets have a reversible curved front door (single or double) made of screen-printed safety glass.

The cabinets can be joined together with baying kits and can be completed with a cabling unit.

All the different cabinet versions have common features and equipment:

- Equipped with 4 x 19'' depth-adjustable uprights
- Removable panels
- Automatic equipotential connection
- Levelling feet adjustable from the inside
- Protection index (weatherproof) against solid objects and liquids: IP 20 conforming to IEC/EN 605 29
- Protection index against mechanical impact: IK 08 conforming to IEC/EN 60062.

The structure can be completely dismantled in case of difficult room access.

The freestanding cabinets can be equipped with a PDU (Power Distribution Unit p. 116) for providing electric power.

### Optimised cable and patch cord management

LCS² freestanding cabinets are designed to ensure **easy cable and patch cord management**: dedicated unit for cords, cable entries at the top and bottom of cabinets, new management panels for perfect organisation and circulation of patch cords.

Optimised cable management
The cabinets offer lots of space beside the 19" uprights to guide and fix large quantities of cables.

Cable entries: top and bottom 19" cut-outs receive 19" plates with brushes and 19" fan plates. Cabling units have a cut-out for direct cable trunking entry.

Management panels: with rings to guide and protect the patch cords.

Linking interface: protects the cables and guarantees the bending radius between the cabinet and the cable trunking.

### Simplified assembly

LCS² freestanding cabinets are easy to equip.
They offer considerable time savings on site and allow full accessibility with their removable side and rear panels and a structure that can be entirely dismantled.

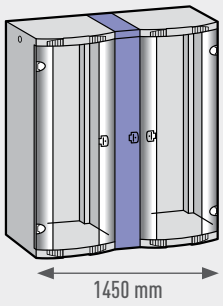
Removable side panels for full accessibility

Automatic earthing clip for earthing the side and rear panels

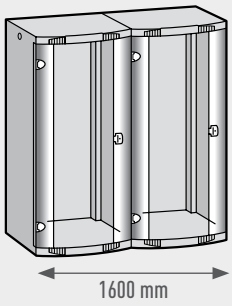
Dual marking of 19" uprights for easy installation

Several combinations are possible to meet various needs: combination of 2 cabinets with baying kit, side by side or with cabling unit. The use of a cabling unit saves floor space.

## COMBINATIONS TO SUIT VARIOUS NEEDS




Two 600 mm wide cabinets with a cabling unit

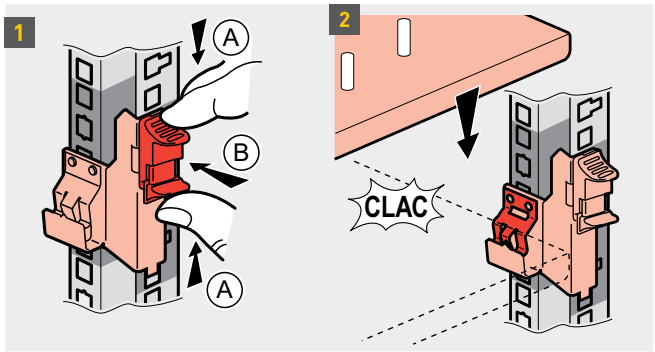



Two 800 mm wide cabinets side by side

### Quick-fixing principle

For easier and faster installation of shelves and cable management accessories, screw-free mounting equipment is available (no tool required).

## EXAMPLE FOR FIXED SHELVES



## 6.1.2 - Server cabinets

### General characteristics

LCS² server cabinets have been designed to meet the main need of the user: full accessibility
Similar design to the other cabinets in the range:
- Anthracite grey RAL 7016 finish
- Reversible front and rear microperforated (80%) metal door.

A cabinet for server requirements:
- Load capacity: 630 kgs
- Equipped with 4 x 19'' depth-adjustable uprights
- Removable side panels
- Top and bottom cable entries
- Levelling feet adjustable from the inside
- Metallic cabinets (textured polyester coating) provide excellent resistance to corrosion and scratching

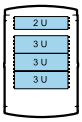
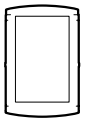
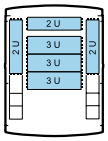
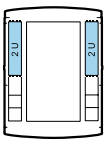
- protection index (weatherproof) against solid objects and liquids: IP 20 conforming to IEC/EN 605 29
- protection index against mechanical impact: IK 08 conforming to IEC/EN 60062.

### Full accessibility

LCS² server cabinets are designed to be fully accessible:
- Reversible rear and front doors
- Choice of locking system: without key, front door can be fitted with a European DIN cylinder (with option to complete with a handle), rear door can be fitted with a key cylinder
- Removable panels
- Cable entries: open bottom, top cable entries in 19'' pre-cut format, capable of taking 19'' plates with brushes, fans, etc,
- Can be equipped with screwless tray fixing for cable trays (Cablofil).

The server cabinets can be completely dismantled where access is difficult.

### Top and bottom cable entries

| | Top | Bottom |
|---|---|---|
| **Width 600** |   |  |
| **Width 800** |   |   |

Front door with handle

Keyless locking system
(view of rear door)

Cable trays
Support with screwless tray fixing - Cablofil

## 6.1.3 - Racks

### General characteristics

LCS² 19'' HD (high density) racks with 45 U capacity are available in 2 versions with different depths of upright: 267 mm or 413 mm. Uprights are designed with U marking and tapped holes for fixing 19'' equipment.

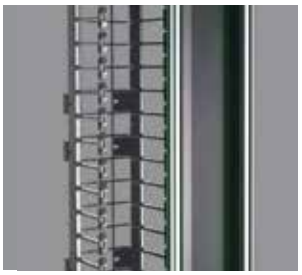
They can receive:
- 19'' metal management panels
- 19'' Power Distribution Units
- DIN rail kit.

Designed in light stainless steel aluminium, with black powder finish, resistant to marks and scratches.
The structure can be equipped with:
- Cord management grid for creating a space (63 mm or 165 mm) between 2 joined racks or an isolated rack for running cables and cords to the front and rear. A version is available with a door which opens in both directions
- Cable tray support to be fitted the full depth of the rack to support a high cable tray
- Lower finishing plate for finishing the lower part of the rack and providing protection against dust.

### Advanced cable management

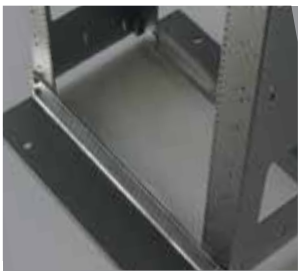
LCS² racks offer full cable management for optimising network performance and are particularly suitable for high-density cabling (e.g. data centers, SANs, main distributors, etc.).
Type of equipment for optimised cable management:
- Channel type 19'' uprights for guiding and fixing cables
- Integrated upper trunking for right-left cord routing that complies with the bending radiuses
- Straps with hook and loop type closure
- Innovative cord management grid creates a space between 2 joined racks for running cables and cords to front and rear. Maintain side cord channels every 1 U

In addition to the support strength, LCS² cable management systems provide flexibility from the system design stage through to any future extensions.

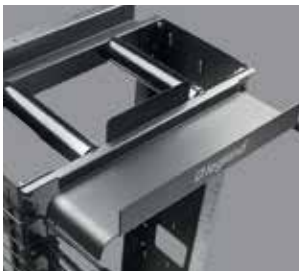


Innovative cord management grids
With individual conduit for each rack unit and door which opens in both directions.

Cord management panels with cover
With conduits for vertical and horizontal cord organization.

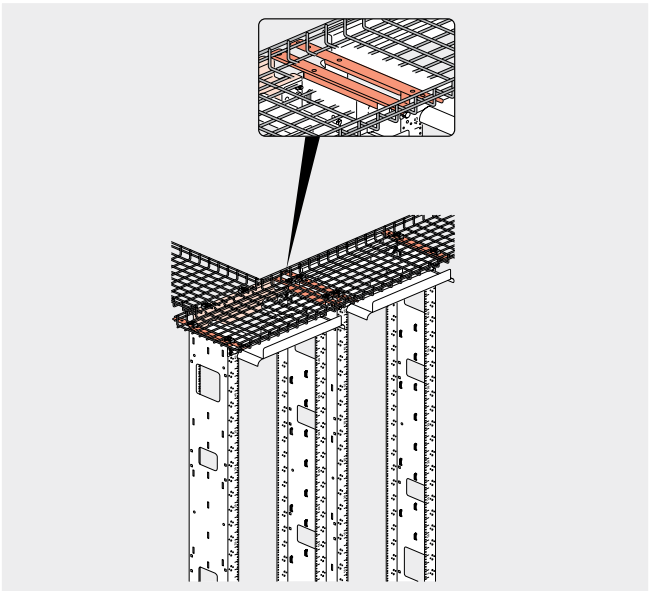


Light stainless steel aluminium construction
With black powder finish, resistant to marks and scratches.



Integrated upper trunking
For compliance with the bending radius and organised running of cords.

## FITTING CABLE TRAY SUPPORTS TO THE RACKS



## 6.1.4 - Wall-mounting cabinets

**General characteristics**

Wall-mounting cabinets are available in 2 versions: 19'' or compact 10''.

The 10'' cabinets are suitable for small business applications up to 36 RJ 45 sockets.

The 19'' cabinets are available in 2 versions: fixed or pivoting, allowing free access to the rear of the cabinet to facilitate installation and maintenance.

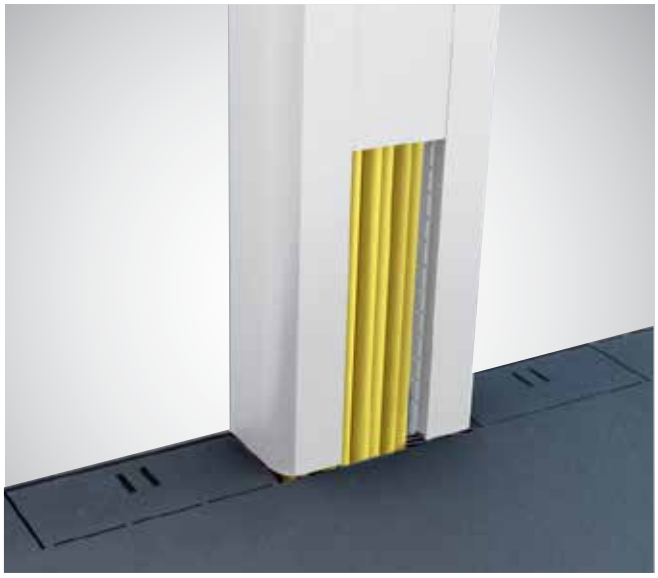
These 2 cabinets have the **same design**:
- A single color finish: Anthracite grey RAL 7016
- Reversible curved screen-printed door made of safety glass.

All the cabinets have **common features and equipment**:
- 2 x 19" depth-adjustable uprights
- Removable side panels
- Rear pre-cut cable entries
- Top and bottom perforations for natural ventilation
- Protection index (weatherproof) against solid objects and liquids: IP 20 conforming to IEC/EN 605 29
- Protection index against mechanical impact: IK 08 conforming to IEC/EN 60062.

**Easy access, high-quality finish**

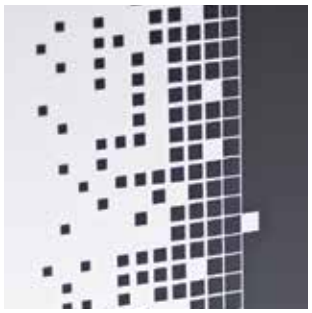
LCS² wall-mounting cabinets ensure easy access for quick installation and easy maintenance thanks to the removable side panels and flexible cable entries (in the fixed cabinets).

Installation anywhere can be possible with these new wall-mounting cabinets where maintaining aesthetic quality is very important.



Flexible cable entries
DLP format cable entries at the top and bottom, bandable, with ability to attach cables using cable ties

Full accessibility for cable management and maintenance
Removable side panels on all LCS² cabinets
19'' cabinets also available with pivoting body to enable easy access at the back
Ability to fix cable management ring on structural uprights of 19'' fixed cabinets



High-quality finish. A unique design: curved door, screen-printed glass.

## 6.1.5 - PDU - Power Distribution Units

### General characteristics

The PDU is a unit which provides electric power for IT equipment.

Available in 2 versions:
- 19''
- Vertical for mounting at the rear of LCS² cabinets (cabling and server) and Varicon-L server cabinets.

The cases are metal for total rigidity.

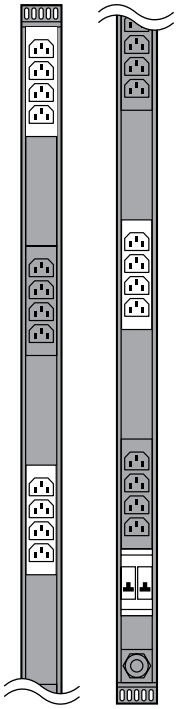
The sockets outlets are adapted to the relevant country's electrical standard:
- International standards: C13 and C19
- Single phase or three-phase.

The PDU integrate features such as MCB protection and voltage protection and can also be metered.

### Metered PDU

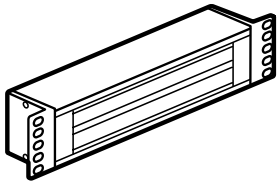
Measures consumption to provide better installation management: balancing circuits, displaying available capacity, preventing overloads and power failures. The information is read locally.

Main characteristics of these PDUs:
- Measurement of the total PDU current
- Measurement from 0 to 32 A
- 2-digit display.



Vertical PDU


Vertical PDU with energy metering system



19'' PDU

# 7 NETWORK WIRING PROJECT

## 7.1 - Topology and definition of the specifications

### 7.1.1 Topology of structured cabling

A structured cabling system is created for a LAN (Local Area Network ) using a star-shaped topology, in which the centre of the star is made up of one or more patch panels. In the star-shaped topology, the cables converge towards a main concentration point with normally corresponds to the location of the equipment to be connected.

Central point of the star


Workstation

### 7.1.2 Definition of the specifications

To ensure the integrity of a project, the requirements must be defined, in terms of description, installation diagrams and request for quotation and also in terms of specifications. A typical wiring structure must include the following points:

- Introduction (purpose of the document, timescales, contractual aspects)
- Reference regulations and standards
- Description of the operation (area to be wired, requirements in terms of applications and integration between installations)
- Description of the installation architecture
- Description of the performance levels
- Technical specifications
- Construction
- Tests and checks to be carried out
- Documentation to be provided.

Breaks in communications or poor quality of the service provided, due to the use of inappropriate components or an installation error, may have serious consequences. The wiring defined by standard IEC EN 50173 applies to a wide range of services, including telephony, data, image and video.

These standards and those in the EN 50173 series define:

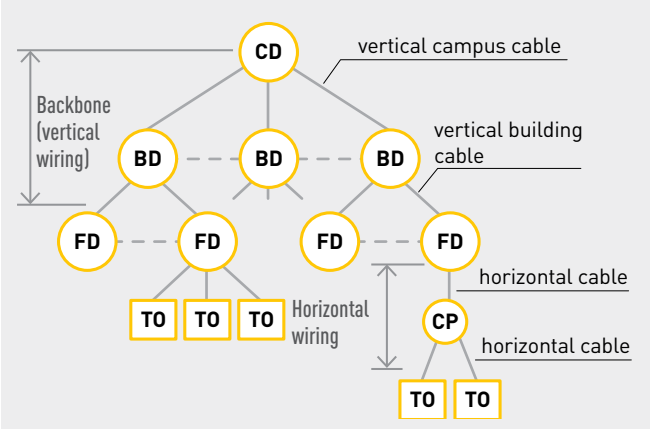
- The structure and minimum configuration of the generic wiring
- The design requirements
- The operating requirements for the links
- The conformity requirements
- The testing procedures.

## 7.2 - Functional components of a wiring structure

The generic wiring system is a star-shaped hierarchical structure. The functional components of a generic wiring system are as follows:

- Campus distributor (CD)
- Vertical campus cable
- Building distributor (BD)
- Vertical building cable
- Floor distributor (FD)
- Horizontal cable
- Consolidation point (CP)
- Telecommunications outlet (TO).

**EXAMPLE OF THE STRUCTURE OF A WIRING SYSTEM**

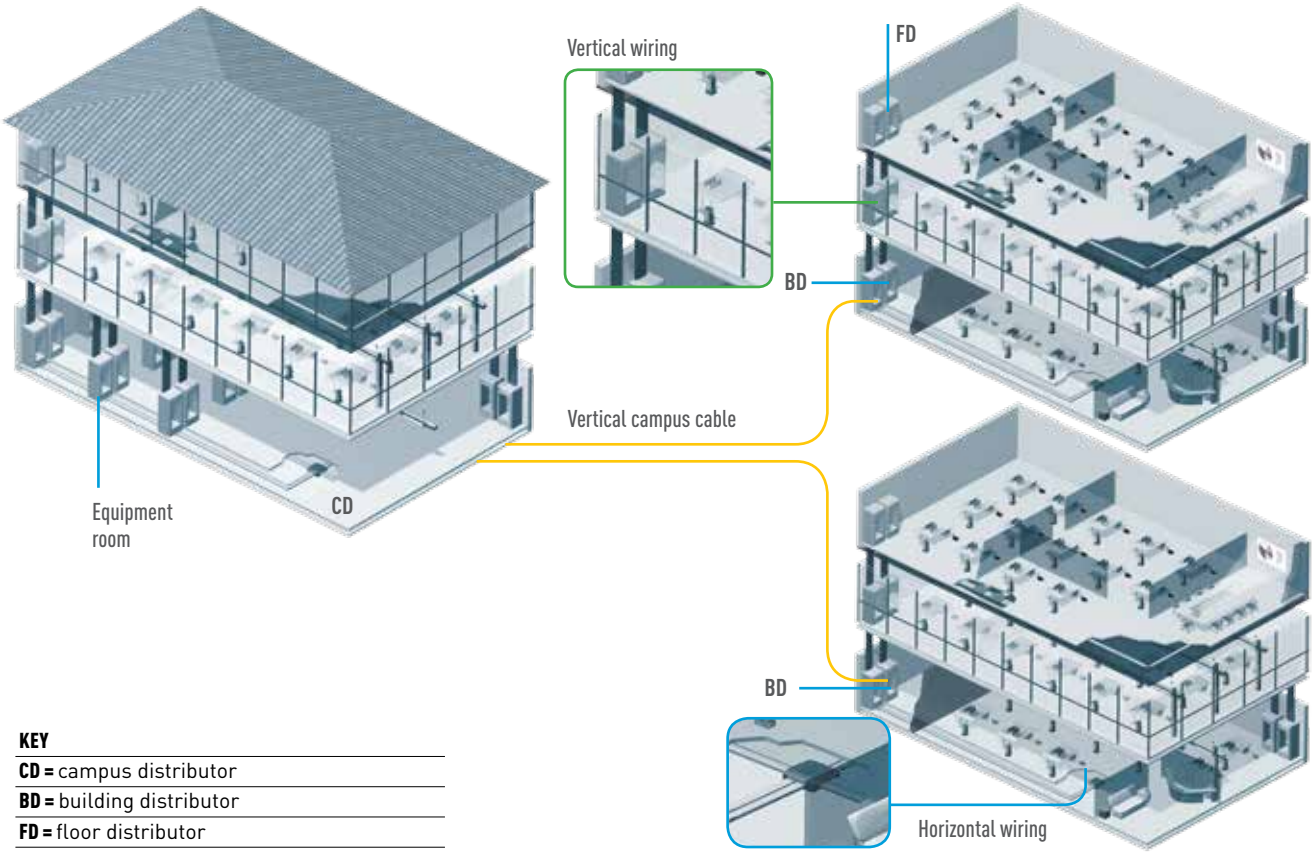


## 7.3 -Wiring subsystems

The number and type of subsystems defined for a wiring system depend on the geographical characteristics, the size of the campus or the building and the user's requirements. In the case of a single building, the main concentration point is the building equipment room. There is no need for a vertical campus wiring system. However, a large building can be treated like a campus, using a vertical campus wiring subsystem and several equipment rooms. The cables must be installed between the adjacent levels in the structure, to form a hierarchical star-shaped structure which provides the high degree of flexibility necessary for the various applications.
The generic wiring contains three subsystems which are connected together:
- Campus backbone
- Building backbone
- Horizontal wiring.

## 7.4 -Design rules

The structured wiring system is an infrastructure which must be taken into account at the building design stage. The standards (TIA/EIA 568, ISO/IEC - 11801 and EN 50173) give extremely simple design and installation specifications whose application enables structured cabling systems to be designed and created without taking the future applications into consideration. The principle of these standards is based on the relationship between the provision of the services and the space.
The connections depend on the surface areas, independently of how these areas will be used at different times. One workstation every 10 $m^2$ will make it possible to reconfigure the spaces without having to contact the installation company to install new lines. The use of open plan areas has played a major role in the establishment of structured cabling systems, with the main advantage being the provision of sufficient equipment, irrespective of how the wired areas are used.
For installations larger than 5000 $m^2$, created with full IP, or those in building structures which have various restrictions (eg: weight limits on ageing raised access floors, saturation of the cable ducts, protected historic buildings, etc.), the infrastructure can be created using FTTO (Fibre To The Office).
This recommends the use of fibre optic vertically and horizontally from the building distributor right up to the usage areas, and including the floor distributor. This enables the outgoing fibres to be distributed via 4 to 6 fibre cables to the manageable area switches.
Fibre optic is used for the vertical and horizontal wiring up to the connection of the SFP ports on the switches which can be in the false ceiling, raised access floor, wall-mounted or in trunking. These switches convert the optical signal to a copper signal, provide PoE/PoE+ with their associated power supply, and are fully manageable.
This architecture thus reduces the cost of the technical rooms item.

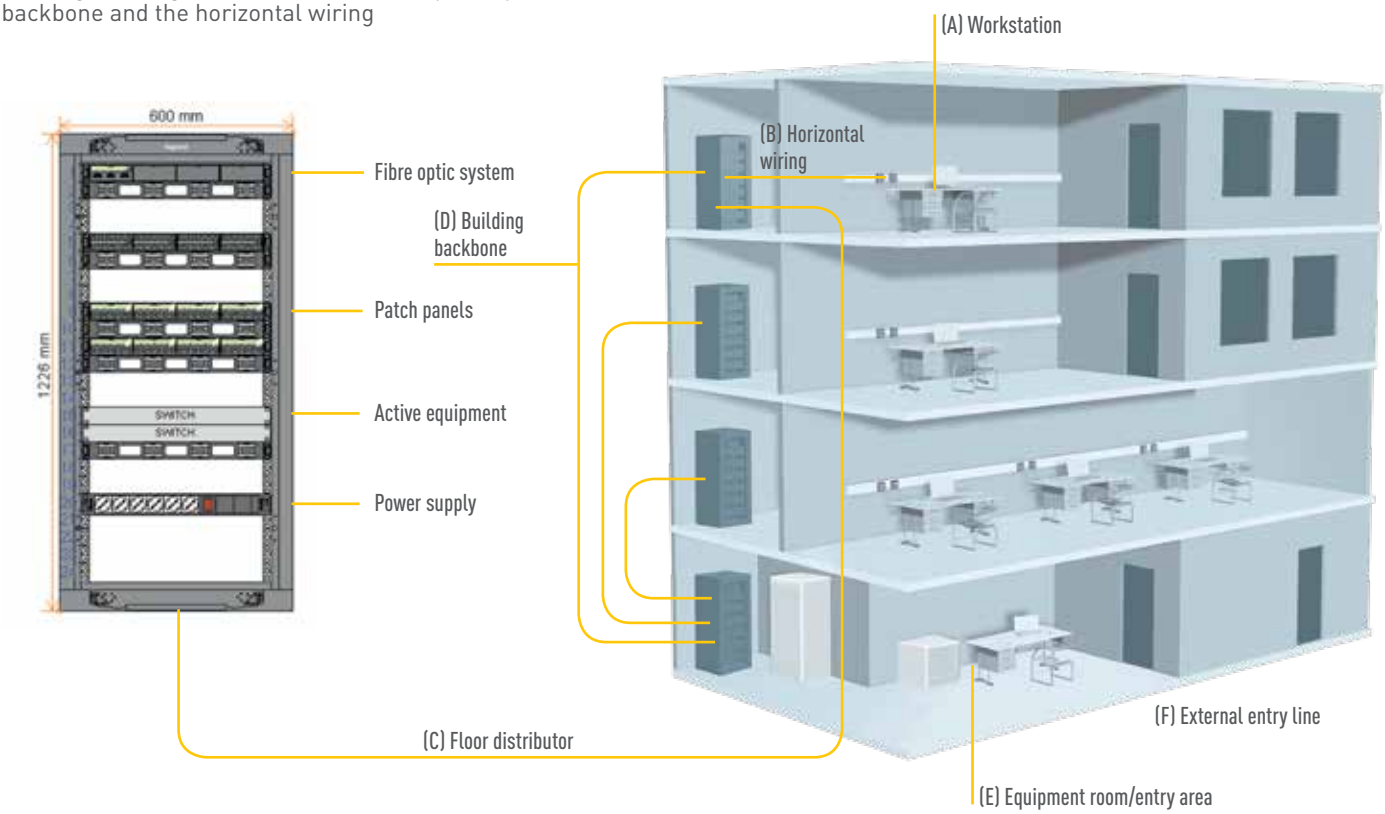



| KEY |
|---|
| **CD =** campus distributor |
| **BD =** building distributor |
| **FD =** floor distributor |

# 7.5 - Main components of structured cabling

A structured cabling system is subdivided into subsystems in which the active and passive components are installed. The main subsystems which make up the structured cabling are:

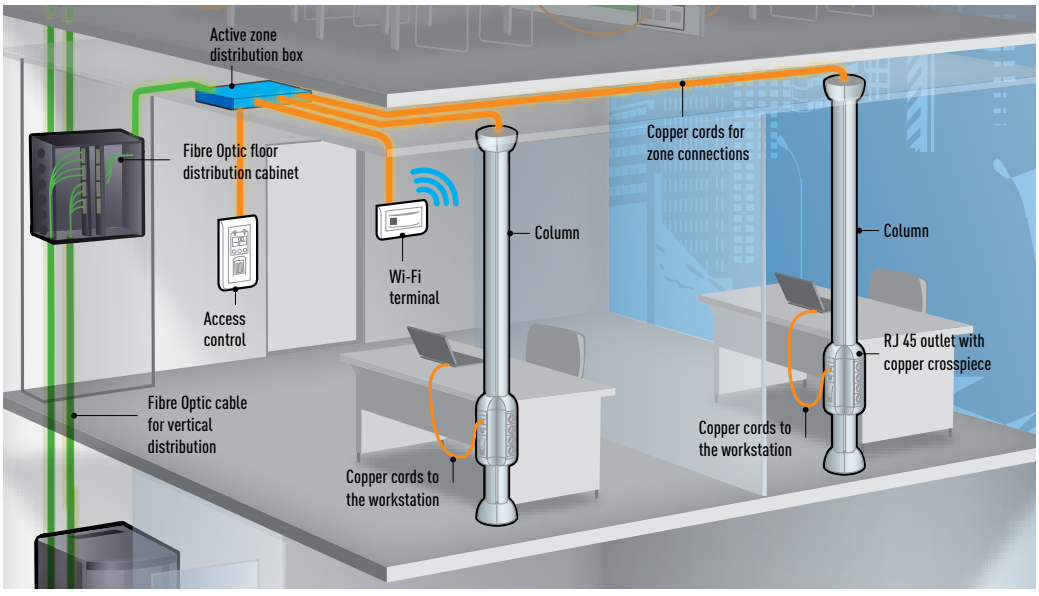
- A - Workstation: this includes the components between the telecommunications outlet and the terminal equipment. The data terminal (PC, printer, etc.), the connection cable and any adaptors are also part of the workstation
- B - Horizontal wiring: this runs from the telecommunications outlet to the floor distributor. It includes the horizontal wiring, the multimedia socket, the cable terminations and the interconnection or patch panel
- C - Floor distributor: the floor distributor is the area of the building housing the terminations and patch panels of the backbone and the horizontal wiring
- D - Building backbone: this connects the floor distributors, the equipment room/entry area. It includes the vertical cables, the main and secondary patching points and the cables between the equipment room and entry area in the building
- E - Equipment room: this is the room housing all the main network equipment serving the wiring
- Entry area: this is the area of the building where the connection is made between the part of the wiring outside the building and that inside the building normally the backbone).




**Fibre To The Office: digital infrastructure**

Example of a configuration for fibre optic distribution in false ceilings or raised access floors

The individual desk is equipped with a zone distribution box that can be installed in a false ceiling or raised access floor. The optical signal is converted to a copper signal by the active zone box. The active zone box distributes five RJ 45 Gigabit outlets, including four PoE/PoE+ ports (max. 120 W).



## 7.5.1 - Workstation

### Telecommunications outlet

The telecommunications outlet distributes the various services to the workstation. The workstation can have a minimum of two connection points (one for telephony, the other for data). Telecommunications outlets must be positioned in areas that are easy to access. A high density of telecommunications outlets increases the flexibility of the wiring. It is advisable to provide at least two telecommunications outlets per working area measuring at least 10 $m^2$, each connected to a connection cable. The outlets must have a permanent label that is visible to the user. Any possible adaptors such as baluns and impedance converters must be outside the outlet.
There are two types of telecommunications outlet:

### Copper

Two 8-pin connectors for connecting the 4-pair 100 ohm symmetrical copper cable.
Legrand offers the following connector solutions:
- Type 110 with insulation displacement by Impact Tool or Tool kit
- TOOLLESS which does not require any tools to connect the cable.

All connectors are available in the various wiring accessory ranges. The various services can be provided at two workstations, using finishing plates that can contain up to four RJ 45 connectors. In this case, a mixture of connectors are used without plates that match the Legrand wiring accessory ranges.

### Fibre optic

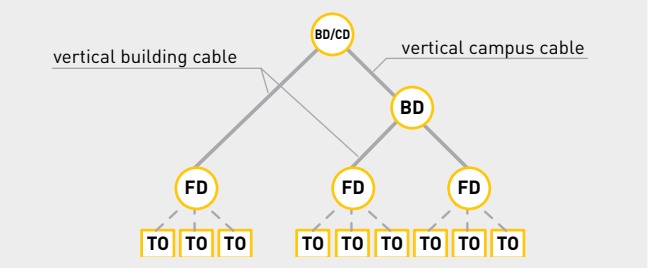
This type of solution is called FTTD (Fibre To The Desk: interconnection principle using fibre optic) and is used in installations in which data is transmitted entirely via fibre optic. This type of installation must provide devices for converting the optical signal. A feedthrough socket for 50/125 µm or 9/125 µm fibre optic is installed as the telecommunications outlet. Legrand offers the following solutions for optical sockets and coupling connectors:
- SC duplex
- ST duplex
- LC.

All feedthrough sockets and coupling connectors are available in the various Legrand wiring accessory ranges.

## 7.5.2 - Horizontal wiring

Horizontal wiring includes the horizontal cables, the mechanical terminations of the horizontal cables, the telecommunications outlets and the cross-connections in the telecommunications room.
The following main rules must be complied with when creating horizontal wiring:
- The horizontal cables must be continuous, from the telecommunications room to the telecommunications outlet
- If necessary use a consolidation point between a floor distributor (FD) and any telecommunications outlet (TO)
- Comply with the maximum connection lengths given in the table (in accordance with IEC EN 50173-1).

## MAXIMUM LENGTHS OF CONNECTIONS

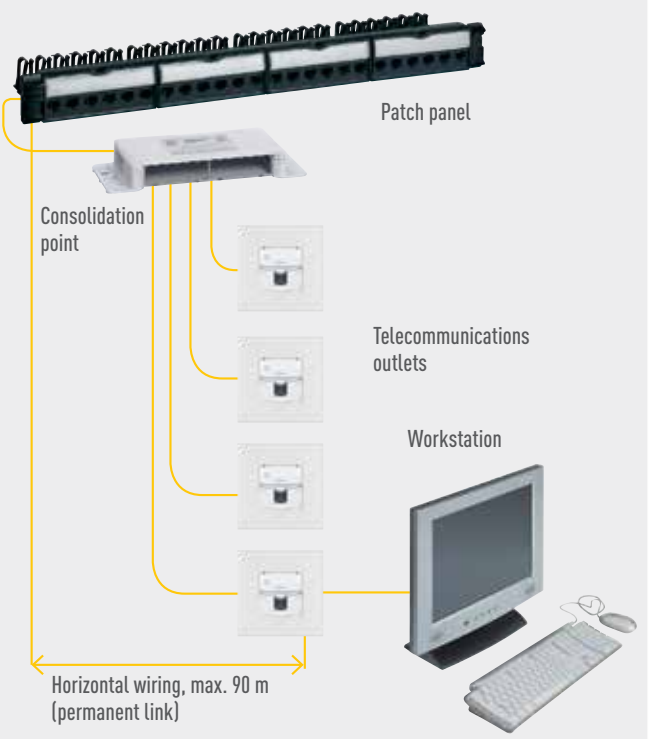



| Length (m) | Type of connection |
|---|---|
| 90 | Horizontal wiring (between FD and TO) |
| 5 | Patch cord between the telecommunications outlet (TO) and the equipment |
| 5 | Connection jumpers inside the telecommunications room |

### Consolidation point

The regulations stipulate that there must be no breaks or joins in the lines linking the floor distributors to the sockets at the workstations. A consolidation point may however be installed between the floor distributor (FD) and the telecommunications outlet (TO), using zone boxes. The use of a consolidation point to create area wiring is helpful in open plan areas which require a high degree of flexibility in terms of reconfiguration of the working areas. Only one consolidation point is permitted, and it must only contain passive connections. The following points must also be remembered:
- The consolidation point can serve a maximum of twelve working areas
- The consolidation point must be placed in an area that is accessible to staff
- A consolidation point must comply with the labelling and documentation specifications and must be included in the wiring management system
- The consolidation point can only contain passive connection hardware.

## EXAMPLE OF INSTALLATION OF A CONSOLIDATION POINT

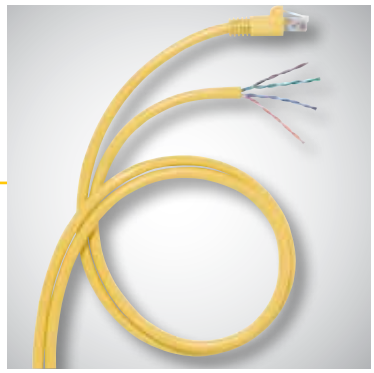


**Main characteristics of the Consolidation Point (CP)**

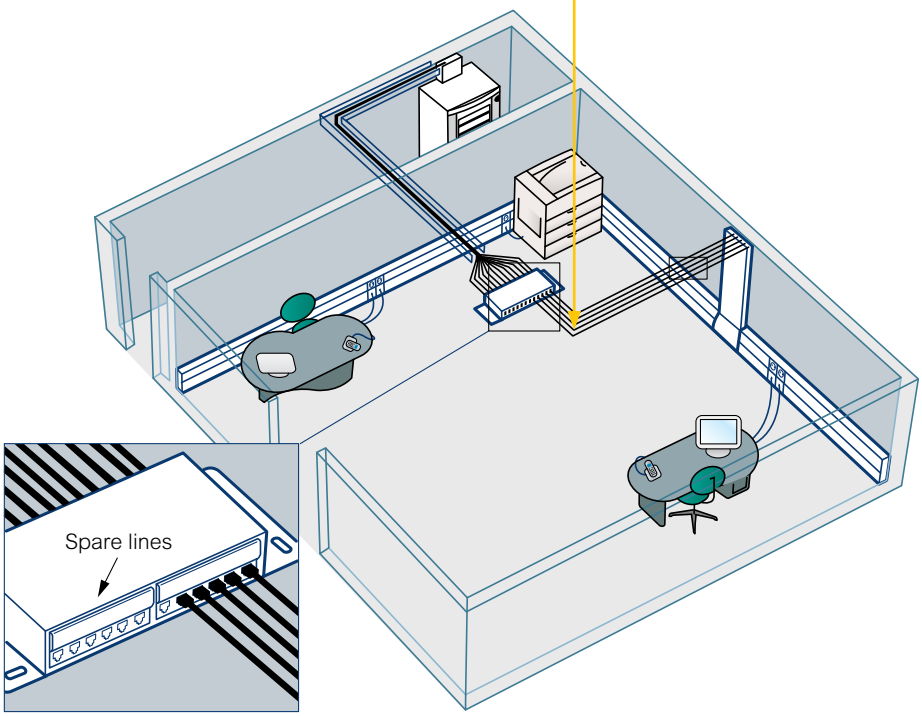
Possibility of installing 2 units of 6 RJ 45 connectors (for up to 12 sockets) for each unit

Maximum flexibility of use due to the ability to install the same number of fibre optic and copper connectors in the same unit

Accessories for fibre optic management



Patch cord, 5, 8 or 20 m



## 7.5.3 - Building backbone

### Building backbone (from BD to FD)

This runs from the equipment room to the telecommunications room. The subsystem includes the vertical cables of the building, the mechanical terminations at both ends of the cables and the cross-connections in the equipment room. The following main rules must be complied with when creating a building backbone:

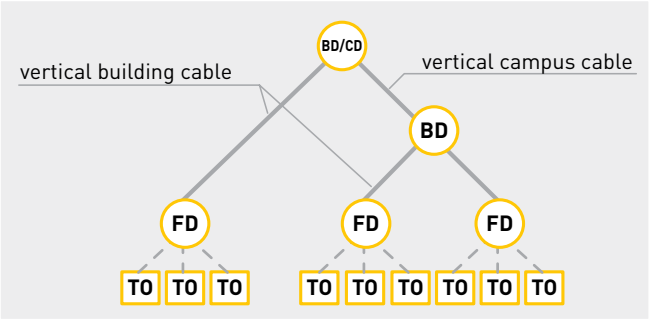
- The vertical cables of the building must not contain any transition points
- The vertical copper cables must not contains any joints.

### Campus backbone (from CD to BD)

This runs from the campus distributor to the building distributor which is generally located in a separate building. The campus distributor includes the vertical cables, the mechanical termination of the cables (both in the campus equipment room and the building technical room) and the cross-connections in the campus equipment room. The following main rules must be complied with when creating a campus backbone:

- There must be no more than two hierarchical patching levels in the vertical wiring, in order to limit impairment of the signal for passive systems and to simplify the management of the cables and connections
- No more than one patch cord may be crossed to reach the campus equipment room when departing from a floor distributor (FD).

## BUILDING BACKBONE PRINCIPLE




| KEY |
|---|
| **CD =** campus distributor |
| **BD =** building distributor |
| **FD =** floor distributor |
| **TO =** telecommunications outlet |

### Sizing the technical rooms

Each 1000 m² area for offices requires at least one telecommunications room. If possible, create a telecommunications room for each floor in the structure. If a floor is not used very much, this floor can be "served" from the telecommunications room on an adjacent floor.

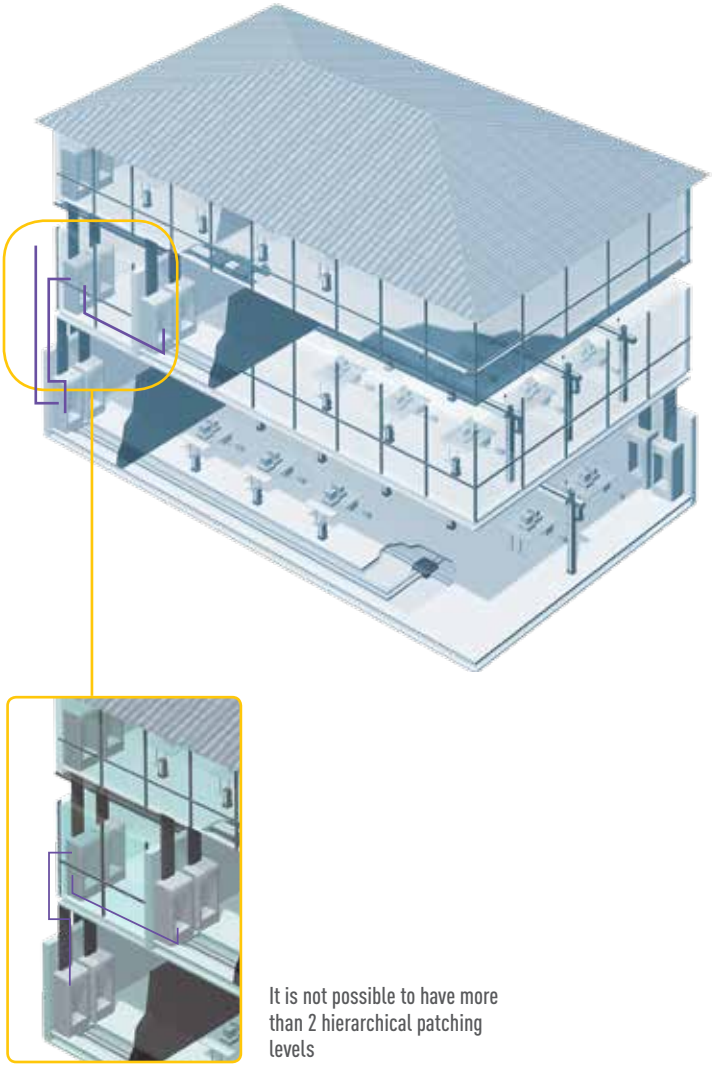
- Vertical wiring distances

The following can be used to create backbones:
- 62.5/125 µm or 50/125 µm multimode fibre optic cables (recommended for creating backbones), or as an alternative, singlemode fibre optic cables
- Cat. 5e, 6, $6_A$ 100 ohm, multipair symmetrical copper cables.

The maximum distance of the vertical wiring between the campus distributor (CD) and the associated distributor in the cabinet must not exceed the distance limits given below.

- Telecommunication enclosures

Each telecommunication enclosure must have direct access to the backbone. When selecting the type of cabinet or enclosure, it is advisable to establish the minimum dimensions, calculating the rack units occupied by the passive and active equipment already defined at project stage.
Second factor to be taken into account: the possibility of future extensions.



It is not possible to have more than 2 hierarchical patching levels

**Maximum lengths of vertical connections in accordance with standard IEC EN 50173-1 (06/2003)**

| Maximum lengths (m) | Type of connection |
|---|---|
| **2000** | Campus backbone + building backbone + horizontal wiring |
| **1500** | Campus backbone + building backbone |
| **500** | Equipment room + telecommunications room |
| **20** | Patch cord in the building and campus equipment rooms |

**Recommended vertical wiring methods**

| Subsystem | Type of medium | Recommended use |
|---|---|---|
| Campus backbone | Symmetrical cables | According to requirements* |
| | Fibre optic | Resolution of problems due to differences in earthing potential and other sources of interference |
| Building backbone | Symmetrical cables | Low to medium speed telephony and data |
| | Fibre optic | Medium to high speed data |

* Symmetrical cables can be used in the campus vertical wiring subsystem if the bandwidth of fibre optics is not required.
Eg: telephone lines

## 7.5.4 - Data backbones (vertical wiring)

Although for telephony the project and the components used in the vertical wiring are relatively standardised, for vertical data wiring the dependence on the type of application is much more obvious. This dependence does not involve loss of flexibility of the installation: the horizontal wiring, in terms of which the installation is qualified, is not affected as a result of the creation or modification of the backbone. The connections can still be used at the performance levels indicated by the reference category or class. In addition it should be noted that the modification or replacement of a backbone is not generally a difficult operation in terms installation and that the inherent transfer of the applications only requires limited downtime of the network. It is advisable to allow for future extensions (during the project stage), both in terms of users and of bandwidth, to avoid too many modifications of the vertical wiring. Modification or replacement of a backbone does not require the wiring system to be re-certified.
Vertical data wiring can be carried out in 2 ways:
- Using a multimode fibre optic (recommended)
- Using a twisted pair copper cable, impedance 100 ohms or category 5e (applications up to 100 MHz) or 6 (applications up to 250 MHz) or $6_A$ (up to 500 MHz).

**Backbones for Ethernet applications**

To date, applications refer to standards with connection via cable and fibre optic. To choose the correct reference standard for vertical connections, the maximum distances that can be covered and the maximum permitted speed must be taken into account, assessing the costs and advantages of each option.

Vertical wiring

**Components for telephone system installation**

Type 110 connection blocks, which manage the pairs individually, are normally used for connection in the main cabinet. A type 110 block can take up to 100 pairs, i.e. 100 telephone lines in the case of traditional 2-wire analogue telephones. The connection cross-section capacity must be at least equal to the number of internal telephone lines. However the possibility of increasing the number of pairs that can be connected should be provided. Many telephone switchboards are extendable and this possibility must be taken into account at the project stage. RJ 45 panels can however be used to replace the type 110 blocks. Using RJ 45 patch panels involves partial use of the pairs available on the RJ 45 panel. For patching, 110-RJ 45 patch cables must be used to transmit the signal to the horizontal distribution (if this has been done using RJ 45 panels), and type 110-110 patch cables if the horizontal wiring is done using type 110 blocks, or RJ 45-RJ 45 patch cords if the whole installation is built using RJ 45 patch panels. On the switchboard side, the use of patch cords will be identical depending on whether the internal lines have been connected on RJ 45 panels or type 110 blocks. An RJ 45 panel is often used for horizontal distribution and a type 110 block for connecting the internal lines on the switchboard side and for the vertical cables.

### 7.5.5 - Technical rooms

The technical rooms constitute the centre of the wired infrastructure star. They are dedicated areas from which the building backbones or the campus connections and the horizontal distribution cables depart or where they terminate. The data, voice, multimedia, automation, control and security services must be managed in the technical rooms and distributed from them to the groups of users in a specific building. There are two different technical rooms:
- Floor technical rooms
- Building technical rooms.

**Floor technical room TR (telecommunications room)**

Telecommunications rooms are the management location where the vertical wiring of the building is interfaced with the horizontal distribution, transporting the services from the main vertical trunking to the working areas.
Each building should have one or more telecommunications rooms. If the infrastructures are shared by several companies, any cohabitation of devices and services intended for different owners must be avoided. If it is not possible to have a telecommunications room for each company, it is essential to separate and identify each owner's areas, distribution blocks and devices.
At the TR project stage, it is important to take into account not only the normal requirements of the traditional telephony and data transmission services, but also all the services that may be used in the future if the functions of the infrastructure are extended: IP CCTV, access control, automation, energy management, alarms and sound systems.
It is therefore very important to calculate the space needed for the network devices, the other active equipment and any future extensions in the cabinets. As a result, no problems in terms of slots in the racks or problems of physical space in the telecommunications room will be encountered.
The telecommunications room must contain the following equipment and devices: rack cabinets comprising:
- Active equipment for the data networks, floor distributors, backbone terminations, telephony management devices and the safety, control and automation services
- Infrastructures for horizontal cable distribution
- Air conditioning systems to maintain the temperature between 18 and 24°C and 30 to 55% ambient humidity
- Fire protection and safety systems
- Electrical safety systems, ensuring that all the metal parts of the infrastructure are connected to the equipotential bonding system in accordance with the standards.

**Building technical room ER (equipment room)**

The equipment room is where the whole infrastructure is managed and where all the functions of the structured cabling system are managed.
In buildings where there are fewer than 100 working areas, the equipment room corresponds to the telecommunications room, in that they can be managed using a single central point in the star network.
In large buildings, with more than 100 working areas, the main, and also possibly secondary, vertical connections depart from the equipment room and run to all the telecommunications rooms.
The equipment room must be designed and positioned so that it can house all the active and passive equipment for the operational management of the services and also the management systems for the air conditioning and uninterruptible power supplies.
All the IT services (room containing the EDP central computer, servers and data storage devices) must be located in the equipment room or in the immediate vicinity.

## 7.6 - Considerations for wireless network projects

Wireless networks require very specific project and layout rules and procedures.
To be sure of creating a compliant structure, it is important to know the user's requirements, which may be:
- Structural requirements, i.e. the type of area to be covered (closed or open plan offices, function rooms with or without obstacles, open spaces, etc.)
- Requirements in terms of performance, which consist of defining the minimum useful band to ensure signal coverage in each room
- Requirements in terms of density, i.e. how many users are anticipated in each area
- Requirements in terms of safety
- Requirements in terms of mobility, to ensure connection even when moving.

Once the user's requirements have been defined, a project can be built and the number and type of access points to be installed (802.11a/b/g/n) in each space can be established.
Next phase: the analysis (visual and using instruments) of the areas in which the wireless network is to be installed. This analysis establishes the basic characteristics of the areas, to assess the presence of obstacles that may cause interference, such as fire doors, metal cabinets, walls, etc.
The availability and layout of power supply points for connecting the access points must also be analysed and the decision made whether it is necessary to supply these via data cable.
Given the possibility of varying the transmission medium according to the installation area (people, topology, equipment, compatibility, etc.), it is advisable to carry out a site study before installation in order to check that the project has been designed correctly.
Knowing that the behaviour of radio waves is unpredictable, one of the most difficult parameters to determine is the sizing of the coverage cell for an access point, also remembering that when the distance increases, the signal weakens and the communication switches to the lower speed.
The access points must therefore be installed in such a way as to ensure the best performance at each point in the area in question. Once the structure, the areas and the sizes of the cells have been analysed, it is possible to obtain the number of access points to be installed.
If adequate performance levels cannot be obtained with a single point, a group must be used. This consists of activating several access points in the same coverage area. To avoid any interference problems, the devices must be programmed on different channels.

# 8 CHECKING THE INSTALLATION

## 8.1 - General

Testing the transmission performance is the phase which, once the installation has been completed, is designed to demonstrate its compliance with the wiring regulations (EN 50173 series, ISO/IEC 11801, TIA/EIA 568C, see section 2). In practice it consists of measuring a whole series of transmission parameters in a certain frequency range, and checking compliance with the limit values over the whole measurement range (eg: Class $E_A$ 1...500 MHz).
Although selecting of compliant components is a necessary requirement, this is not sufficient to ensure that the nominal transmission performance levels are complied with in the actual installation.
The wiring must be installed in accordance with good practice. In this respect it is advisable to follow the instructions in the specific standard (EN 50174-2, ISO/IEC 14763-2, etc. see section 2). These two requirements are the prelude to a positive test.
Some errors may nevertheless have been made during installation. The final test will establish whether errors have been made and it they have compromised compliance. If the test is negative, the cause must be found and corrected. This is not always easy, especially in large-scale installations. For this reason it is important to carry out the initial phases rigorously.
The guidelines for doing so are given in this section.
Standard IEC 61935-1 specifies the testing methods for each transmission parameter for copper wiring, and the requirements for the measurement instrument.
The testing of structured cabling systems is governed by standard EN 50346.
The standard indicates how to conduct the test. It also gives references to the original testing methods, for both copper and fibre optic, but does not provide any information on how to resolve any non-compliance problems.

The regulations for structured cabling are voluntary. There are no legal provisions making it compulsory for the installer to provide a declaration of conformity, as is the case for electrical installations.
The value of the test report is not the same as the declaration of conformity of the electrical installation.
However, in practice, the customer generally requests the test report as proof of the positive completion of the work.
To summarise, a test report makes it easy to:
- Prove that the installation complies with the required nominal performance
- Fulfil a contractual obligation (customers often require a final test as a condition of acceptance of the work)
- Guarantee the installation supplied for a certain period (according to the contractual guarantee terms)

The verification takes the form of a process stipulating checks and tests:
- Visual
- Static electrical
- Of the transmission parameters.

These phases are generally sequential. For example, a negative static electrical test makes testing the transmission parameters meaningless before the cause of this negative outcome has been eliminated.
But this is not a set rule: the decision on how to proceed can be made according to the type of result of each preliminary phase. The testing of optical systems is similar. It is described in section 7.5 and stipulates the following checks and tests:
- Visual
- Conformity of the connectivity
- The transmission parameters.

## 8.2 - Copper wiring

### 8.2.1 - Copper wiring: visual check

This phase is simple and immediate, and involves:
- Checking the catalogue numbers of the components installed
- Checking there are no excessive mechanical stresses on the cables (eg: identification of points characterised by visibly incorrect bending radiuses)
- Checking that the cable ties do not tighten the bundles too much; and checking the sheaths are not distorted
- Checking the wiring of the sockets and patch panels, and that all conductors are connected correctly
- Checking that all functional earth connections are present (cable shielding, connectors, etc.)
- Checking that the cords are compatible with the nominal class of the link.

### 8.2.2 - Copper wiring: static electrical test

The static electrical test is used to verify:
- The complete connection of each link, i.e. the electrical continuity
- The correspondence with the topological diagram
- Compliance with the polarity, if required
- That there are no accidental short circuits between each conductor
- The isolation between conductors and to earth
- The correspondence between the installation diagram and the installation itself
- The continuity of the foil screen, if present (FTP, STP, S/FTP). This test may not be included on some models of certification instruments.

Some certification instruments stop the test procedure if there are static electrical errors. On other models, it is possible to force the continuation of the test. However, it is not necessarily worthwhile continuing the test on the transmission parameters. This possibility must be assessed according to the types of error found when carrying out the static electrical test. A few suggestions on the most frequent causes of failure of the static electrical test are given below.
Mapping errors:

**Open:**

- Conductors broken due to stresses, generally on the connection points
- One of the two connectors used for the test is not connected (another one has been inadvertently connected in its place)
- Damaged connector
- Cuts or breaks inside the cable
- Conductors connected to the wrong pins
- Cables for specific applications (eg: Ethernet, wiring of single conductors 1-2, 3-6).

**Short-circuit:**

- Incorrect termination
- Damaged connector
- Presence of conductive dirt between the pins of the connectors (the shape of the RJ 45 encourages dust and fluff deposits)
- Cables for specific applications (eg: control systems)
- Inverted pairs: conductors connected to the wrong pins on at least one of the two terminations.

**Twisted pairs:**

- Conductors connected to the wrong pins on at least one of the two terminations
- Mixture of 568 A and 568 B connections
- Crossed cables (pairs 1-2 and 3-6 cross).

**Pairs separated:**

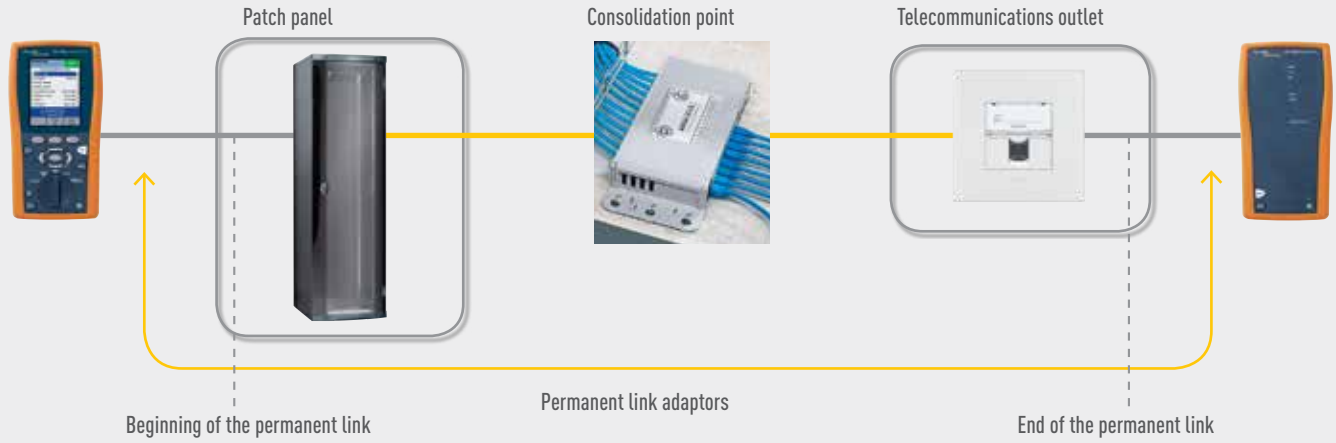
Conductors connected to the wrong pins on at least one of the two terminations.

## 8.2.3 - Copper wiring: testing the transmission parameters

Testing the transmission parameters is the fundamental phase of all the processes and enables the installation to be declared compliant. If they are carried out meticulously, the visual check and static electrical test will provide the best preparation for this phase.

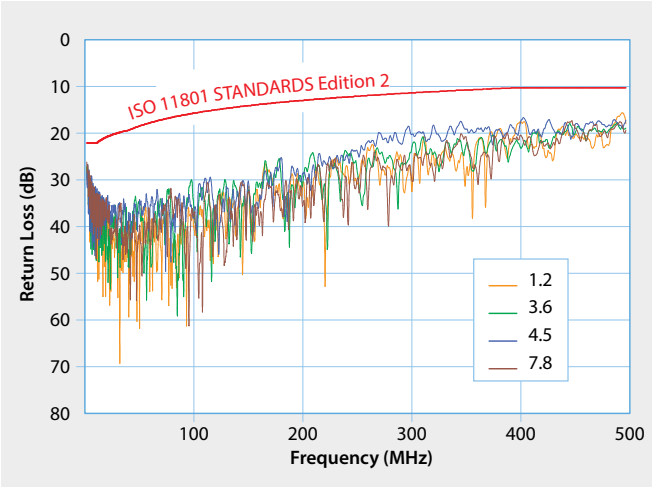
The instrument used to carry out this testing, the certification instrument, consists of a transmitting unit and a receiving unit which, when connected to the ends of the connection to be tested, exchange test signals enabling processing of all the transmission parameters which the system standards (EN 50173, ISO/IEC 11801, TIA/EIA 568C) require to be checked. A resident software program launches an automatic measurement routine, which carries out all the necessary measurements in the frequency range concerned (eg: 1...500 MHz for class $E_A$) and compares them with the corresponding limits.
The instrument must be configured by selecting the limits to be applied, which vary according to the regulations (there are currently slight differences between EN, ISO/IEC and TIA/EIA) and the type of measurement to be performed (channel or permanent link).
The difference between a channel and a permanent link is whether the connection cords on the part to be measured are included (channel) or omitted (permanent link).
The maximum length of the permanent link is 90 m, while that of the channel is 100 m (90 m link + 2 x 5 m cords) if two fixed sockets only are present at the ends. If there are intermediate patch panels or transition points, the standards provide formulae to proportionally reduce the maximum lengths. As a guide: 1 m/patch panel. The actual length of the link can be calculated in detail by taking into account the formulae given in standard EN 50173-1. For example, for a class $E_A$ link:
B = 105 - 3 - F . X
Where:
**B:** actual length of the link
**F:** Number of patch panels
**X:** Relationship between the attenuation of the cord and the attenuation of the cable, in dB/m.
Before starting the certification, the propagation velocity of the light in the cable being tested must be configured, in accordance with the instructions of the manufacturer (NVP), and the instrument for measuring the channel or the permanent link must be provided.
The provisions for carrying out the test procedure correctly are in standard EN 50346.

## GENERAL DIAGRAM FOR CHECKING THE TRANSMISSION PARAMETERS




General diagram for testing the transmission parameters (source: Fluke Networks documentation)

The final result of the test is a frequency distribution of a series of curves, the number of which varies according to the parameter.
All these curves must comply with a regulatory limit.




Example of the result of a transmission parameter test (NEXT, near end crosstalk)

The above figure shows an example of a NEXT (near end crosstalk) test. The red curves represents the regulatory limit according to the frequency (eg: 1...500 MHz, class $E_A$). The different coloured curves represent the attenuation measurement carried out by injecting a test signal on the pair AA terminated on its impedance, and measured on one of the three adjacent pairs (terminated on both sides on the characteristic impedance) on the same side as that of the injection (near end). Switching over the measurements on the four pairs, taking the measurement on each of the three adjacent pairs and taking the measurements on both sides of the link, the following is obtained:
3*4*2 = 24 curves. To obtain a positive result, all these curves must remain below the limit, while the minimum value of the difference in dB between the limit curve and all the points on the curves measured constitutes the margin of compliance.
Similar considerations can be applied for all the other parameters: attenuation, return loss, PSNEXT, ACR, ANEXT, PSANEXT, AACR, PSAACR, LCL, propagation delay, propagation time difference, etc.
The software which controls the operation of the certification instruments is constantly being updated in line with changes to the standards.
The installer must therefore check that the most recent version is being used.
The software versions may differ according to the type of parameter to be measured, the limit values and their definition and/or calculation algorithm.
The manufacturers of certification instruments generally supply software updates free of charge on their websites.
The instrument must be calibrated at regular intervals by a specialist laboratory or by the manufacturer, to ensure its measurement accuracy.
This operation must not be confused with self-calibration, which must be carried out before each measurement, and which is simply a measurement cord compensation procedure, the purpose of which is to provide the exact reference for the measurements to be carried out.
If the test is positive, the installation can then be declared as conforming to the selected standard (EN50173, ISO/IEC 11801, TIA/EIA 568) and the final report can be drawn up.
If the result is negative, the cause of this failure must be found and eliminated.
A few suggestions on the most frequent causes of errors are given below.

**General errors:**

- Has the class/category been selected correctly?
- Has the software of the certification instrument been updated?
- Have the correct measurement heads been used?
- Is a channel or a permanent link being tested?
- Has an appropriate propagation velocity (NVP) been entered?
- Although the limit values can be accepted temporarily, they require an additional examination, according to the parameters, as specified below.

**Errors on the length of the wiring:**

- Measured length longer than the authorised limits:
  - The cable is too long. Assess the possibility of reducing the cable coils at the connections or follow other installation routes.
- The propagation velocity (NVP) has not been set correctly
- Measured length obviously shorter than that installed:
  - Intermediate break on the cable
  - One or more pairs are much too short:
  - Cable damaged
  - Connection error.
- Propagation delay/propagation time difference (above the limits):
  - Cable too long (propagation delay)
  - The cable uses different insulating materials for the pairs of which it is made up (if this is the case, replace it).
- Attenuation:
  - Too long
  - Poor quality cords
  - High impedance in the connections (a specific measurement must then be carried out)
  - Incorrect use of lower category components (eg: 5e cord in a class E link).
- Incorrect execution of the self-calibration routine on the certification instrument
- NEXT and PSNEXT ("fail"):
  - The connectors/sockets have not been connected in line with the "unwinding" rules for each pair (poor twisting)
  - Poor impedance matching between connectors and sockets (most probably as a result of mixing components from different manufacturers for category 6 and higher)
  - Use of an incorrect measurement head on the certification instrument
  - Poor quality cords, connectors, sockets or cables
  - Cable ties too tight in cable bundles
  - Presence of elements creating interference near the link
  - See return loss errors: NEXT errors can be a result of return loss, due to the large width of the reflected signal.
- NEXT and PSNEXT ("pass" when there is an error - masked "fail", which could appear in the future):
  - A good quality cable can withstand minor knots and kinks
  - Incorrect test procedure selected: a "poor" class E link may pass the class D test which has been configured in error (also test the frequency range).
- "Fail" at low frequencies and "pass" at high frequencies: in reality, the problem concerns the whole frequency range and may be due to one of the above causes

- Return loss ("fail"):
  - Characteristic impedance of the cords incorrect (other than 100 Ω)
  - Damaged cords have lost the characteristic impedance value
  - Loss of the "twisting" pitch during installation
  - Too many cables in the boxes containing the telecommunications outlets
  - Poor quality connectors/sockets
  - Poor quality cable: characteristic impedance not uniform along the whole length
  - Poor impedance matching between connectors and sockets (most probably as a result of mixing components from different manufacturers for category 6 and higher)
  - Erroneous use of a cable with 120 Ω characteristic impedance (previous generation components)
  - Too much stock of cables in the cabinets
  - Instrument self-calibration error and/or inappropriate selection of measurement cables and heads.
- Return loss ("pass" when there is an error - masked "fail", which could appear in the future):
  - A good quality cable can withstand minor knots and kinks
  - Incorrect selection of lower limits
  - "Fail" at low frequencies and "pass" at high frequencies: in reality, the problem concerns the whole frequency range and may be due to one of the above causes.
- ELFEXT and PSELFEXT:
  - See NEXT
  - Too much cable in coils that are too tight.
- Resistance:
  - Cable too long
  - Oxidised contacts
  - Conductors incorrectly connected in connectors or sockets
  - Cable with abnormally thin conductors (check the nominal AWG) or poor quality cord.

## 8.3 - Fibre optic wiring

### 8.3.1 - Fibre optic wiring: visual check

This phase is simple and immediate, and involves:
- Checking the catalogue numbers of the components installed
- Checking there are no excessive mechanical stresses on the cables (eg: identification of points characterised by obviously incorrect bending radiuses)
- Checking that the cable ties are not too tight on the bundles; and checking the sheaths are not distorted
- Checking the wiring of sockets and patch panels, i.e. that all conductors are connected correctly
- Checking the cleanliness of the interface surfaces of the components
- Checking that the cords are compatible with the type of fibre optic in the link (eg: 50/125 µm).

Devices to assist with visual checking and cleaning the surfaces of the connectors are commercially available.

Example of microscope for visually checking the surfaces of the connectors and connector cleaning kit

### 8.3.2 - Testing the connectivity

As for copper wiring, this phase involves establishing whether the connections have been made correctly.
A device called a visual fault locator injects visible light into the termination of a link and checks that it exits at the other end. This system can also be used to identify breaks, excessive folds and macroscopic connection errors on connectors. Less serious errors of this type may not be detected during the connectivity test, but can be identified using the more accurate reflectometry test.

Examples of commercially available visual fault locator devices

## 8.3.3 - Testing the transmission parameters

The following transmission parameters must be tested for optical links:
- Attenuation (dB)
- Polarities
- Length (m)
- Return loss (dB)
- Propagation time (ns), optional.

The transmission parameters for fibre optic wiring are tested using the following methods:
- Photometry
- Reflectometry.

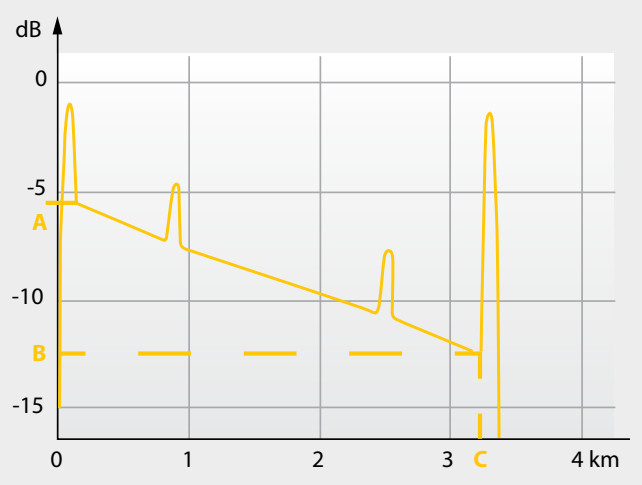
Photometry tests: these are based on measuring the attenuation of a light pulse, of the nominal wavelength for the type of link, applied between the two ends by a certification instrument.

The certification instruments must record the following wavelengths (in accordance with standard EN 50346):
- Multimode fibres:
  - 850 nm ± 30 nm
  - 1300 nm ± 20 nm.
- Singlemode fibres:
  - 1310 nm ± 10 nm
  - 1550 nm ± 20 nm.

As for the tests on copper cables, the certification instrument consists of a transmitting unit and a receiving unit which exchange signals. Measurement of the optical attenuation of the signal is adequate to certify a link. However, if there are problems, it is necessary to perform additional reflectometry measurements in order to find the causes of the failures.

Examples of photometric certification instruments

Reflectometry tests: these are based on measuring the time taken by a light pulse to travel the distance of the link forwards and backwards (after reflection). A specific instrument called an OTDR is used for this.
There are two types of reflected signal: "strong" and "weak". The former, generated by Fresnel reflection, indicate the presence of microcracks in the fibre. Weak reflections are caused by back-scattering of the light and are used to measure the attenuation.




Example of reflectometry measurement: the decreasing trend is used to measure the attenuation (AB). The peaks correspond to Fresnel reflection situations, located at specific points where there are discontinuities inside the fibre, due to connections. At C, the attenuation after the peak falls to - ∞, a clear sign of a break.

Example of an OTDR

Reflectometry measurements must be carried out using the "launch fibre", i.e. a piece of cable that is in addition to the link to be checked, which is used to resolve the issue of the "dead zone" of the instrument and thus analyse the entire length of the link. The first few metres of cable would not be visible without the launch fibre.
Putting together all the above information, the most effective method for testing fibre optic wiring can be summarised in five points:
1) Visual check of the cable on the reel: preliminary check of the type of cable, and to ensure there is no macroscopic damage
2) Reflectometry measurement of the bare fibre before installation: check to ensure there is no micro-damage on the cable
3) Reflectometry measurement of the bare fibre after installation: check to ensure there is no micro-damage on the cable, which has occurred during installation
4) Visual check + cleaning of the connectors
5) Final test on the installed fibre fitted with connectors: using photometry and/or reflectometry method.

# 9 SUPPORT

## 9.1 - Project performance guarantee

The performance of an installation must stand the test of time. This is why Legrand offers the installer the opportunity to guarantee the long-term continuity of performance of a cat. $6_A$, 6, 5e or OM1, OM2, OM3, OM4, OS1 or OS2 LCS² cabling system. Two guarantees ensure the durability of your installations:

**The 25-year performance guarantee:**

Legrand offers the installer the guarantee of continuity of performance levels of an LCS² cabling system on link or channel over time.

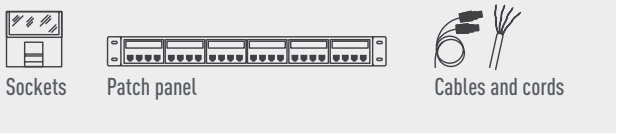
**3-year extended guarantee on additional products:**

By taking out the Performance guarantee opposite, the usual 2-year Legrand guarantee is extended to 5 years for the following products:
- Enclosures
- Cabinets
- Patching accessories (feedthroughs, shelves, etc.).

### 9.1.1 - 25-year link or channel performance guarantee

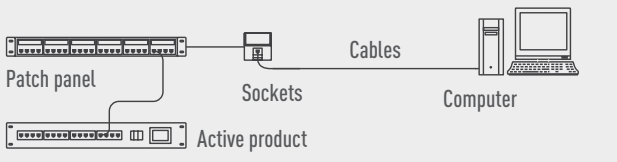
The link guarantee relates to an assembly consisting of the following components:
- Patch panel
- Copper or fibre optic cable
- Terminal socket
- Zone distribution box
- Fibre optic cassette and/or fibre optic drawer with feedthrough
- Pigtail.

Performance is measured over a maximum length of 90 m for copper links. For fibreoptic links see the contract.




A channel is defined by the standards as being an assembly consisting of the following components:
- Patch cord or jumper
- Patch panel
- Copper or fibre optic cable
- RJ 45 socket
- User cord
- Zone distribution box
- Fiber optic cassette and/or fiber optic drawer with feedthrough.

Performance is measured over a maximum length of 100 m for a copper channel. For a fibre optic channel respect the maximum length associated with each performance level (refer to the contract).




### 9.1.2 - 3-year guarantee extension

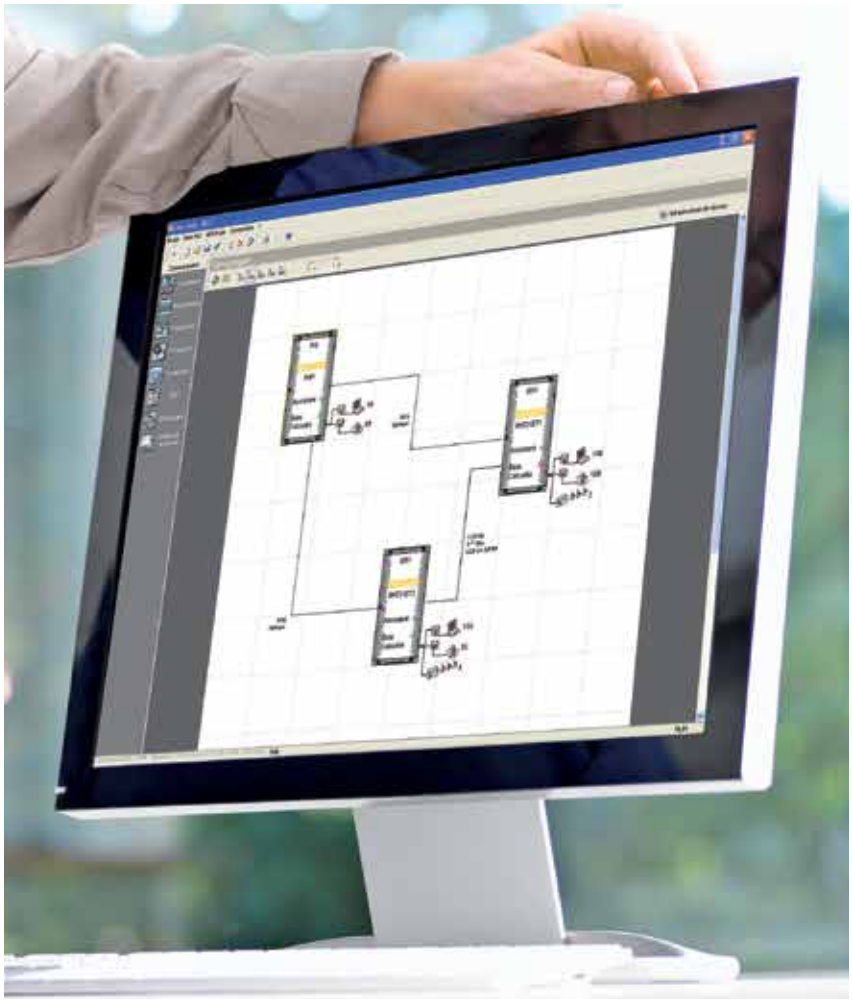
The guarantee extension means a period in addition to the initial guarantee delivered by Legrand in the frame of its general sales conditions, and a three (3) year extension of the guarantee covering correct operation on products referred to as ADDITIONAL PRODUCTS, excluding all other products and equipment:
- Enclosures
- Cabinets
- Patching accessories (feedthroughs, shelves, etc.).

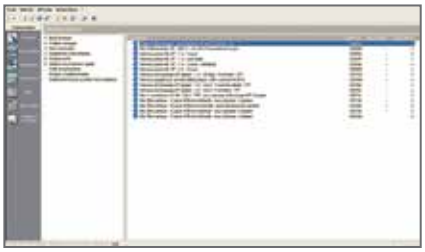
### 9.1.3 - Conditions of the 25-year guarantee

The Guarantee only applies to the installation carried out at the worksite for which the details are given in the Installation Identity Document.
The INSTALLER can only benefit from the Extended Guarantee if all the following conditions have been met:
- The installer has stored the components used in the installation under conditions that are appropriate to their nature
- The installer has carried out the installation in strict compliance with good practice and in accordance with the following combination of conditions:
  - All the components used in the cabling system must be Category 5e, 6 or $6_A$ or OM2, OM3, OM4, OS or OS2 components of LEGRAND LCS² cabling systems, listed in the Installation Identity Document, or failing that, products recommended and approved by LEGRAND
  - The installation must be carried out in accordance with the rules defined in installation standards EN 50174, EN 55022 and ISO 11801 or EN 50173, which are in force on the date the Guarantee is granted
  - For a CHANNEL Performance Guarantee, all the patch cords and user cords must be original LEGRAND components. The length of a patch cord is limited to 5 meters.
- As well as the signed agreement, the Installer has delivered to LEGRAND the Installation Identity Document, consisting of:
  - The completed Worksite Details
  - List of VDI PRODUCTS and ADDITIONAL PRODUCTS with their quantities
  - The «Key Points» document completed, checked and signed to indicate that the INSTALLER has complied with these points
  - A copy of the installed equipment layout plan bearing the installer's company stamp
  - Documentation on the installation acceptance test carried out in accordance with current standards.
- The INSTALLER must ensure that the data for the installation acceptance test conform to the values specified in the performance standards
- Any subsequent modifications must comply with the conditions listed above. Any "new phase of work" type extension to the installation must form the subject of a new agreement.

# 9.2 - LCS Pro² software: all the products you need for an LCS project

The new LCS Pro² software lets you select your products quickly and easily, view your cabinets and much more...





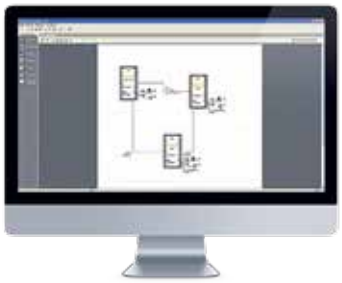
Automatic determination of catalogue numbers by selecting the features and options

Easy project management
Technical records, purchase orders, document printing

Visual display of the enclosure layout with option to make changes

**Discover the new features:**

- Create the block diagram of your installation
- Find Cat. Nos automatically by selecting characteristics and options
- Display the cabinet installation and amend it if required
- Manage your projects: technical summaries, purchase orders, document printing.



# 9.3 - Top-level training at India

The aim of Legrand Training Centre is to equip the customer with complete product know-how, right from the selection of the product, its application, to the end to end solutions that can provide him with an ideal choice for his needs. It is an place to discover the aesthetic, technical and innovative potential of Legrand products and systems in a real-life situation.

With a balanced approach towards training, the Legrand Training Centre has interactive panels for lively communication of theoretical knowledge as well as workshop area for immediate practical application of the acquired skills.

Further the Training modules are developed to meet the identified training requirements of specific industries and market segments like VDI, power/high voltage, lighting management and security systems.

The Legrand Training Centre is present in seven locations across India viz. **Delhi, Kolkata, Mumbai, Pune, Bangalore, Chennai, Hyderabad.**

**Comprehensive classes**

- Copper installation: essential for commercial sites
- Fibre optic: use and testing of an installation
- Copper: use and testing of an installation.

**Classes to understand different methods**

For example using a fibre optic backbone and connecting and testing the fibre optic links, as per the standards in force.

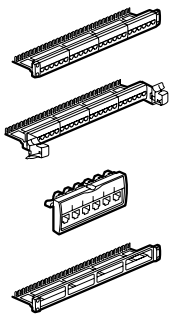
**Classes to convert the telephone** and computer network needs of your clients into complete and upgradeable solutions, and cabling them as per the standards in force.

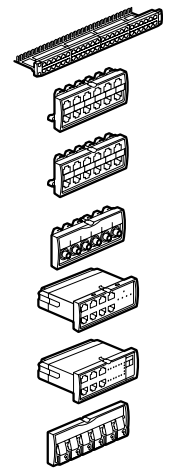
# DIGITAL INFRASTRUCTURES

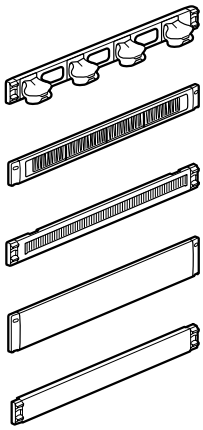
## SYSTEMS FOR COMMUNICATIONS NETWORKS IN COMMERCIAL BUILDINGS

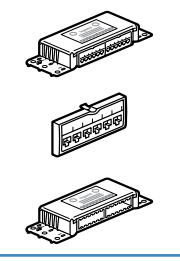
# Selection chart for equipment and cabinets

**configure your LCS² system**

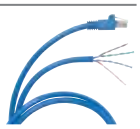
| LCS² PANELS AND CONNECTOR UNITS (see p. 78, 83, 88) | | | LCS² cat. 6$_A$ | LCS² cat. 6 | LCS² cat.5e |
|---|---|---|---|---|---|
|  | Patch panels 1U<br>Fitted with 24 connectors | STP | Quick-fixing 0 335 73 | Quick-fixing 0 335 63 | - |
| | | FTP | - | Quick-fixing 0 335 62 | 0 335 52 |
| | High density patch panels | STP | 0 335 86 | - | - |
| | | FTP | - | 0 335 68 | - |
| | | UTP | - | 0 335 67 | - |
| | Units of 6 x RJ 45 connectors | STP | 0 335 76 | 0 335 66 | - |
| | | FTP | - | 0 335 65 | 0 335 55 |
| | Blanking plate | | 0 335 91 | 0 335 91 | 0 335 91 |
| | Patch panel 1 U<br>To be fitted with 4 units | | Quick-fixing 0 335 90 | Quick-fixing 0 335 90 | 0 335 90 |

| ADDITIONAL LCS² PANELS AND UNITS (see p. 93, 95) | | | LCS² |
|---|---|---|---|
|  | Telephone panels 1 U<br>Fitted with 4 units of 12 ports | 3-6/4-5 contacts (digital) | Quick-fixing 0 335 31 |
| | | 4-5/7-8 contacts (analogue) | 0 335 30 |
| | Telephone units<br>Fitted with 12 ports | 3-6/4-5 contacts (digital) | 0 335 33 |
| | | 4-5/7-8 contacts (analogue) | 0 335 32 |
| | Doubler units | Ethernet/Ethernet FTP | 0 335 39 |
| | | Telephone/Ethernet FTP | 0 335 37 |
| | | Telephone/telephone | 0 335 35 |
| | Video streaming unit | 6 x "F" connectors | 0 335 34 |
| | Switch units | 7 x RJ 45 ports | 0 335 02 |
| | | 6 x RJ 45 ports + 1 LC type optic port | 0 335 05 |
| | Power over Ethernet (PoE) injector | 4 ports | 0 335 01 |
| | Controlled access units | | 0 334 71/72/73/74/75 |

| LCS² 19" FEEDTHROUGH PANELS AND BLANKING PLATES (see p. 111) | | | |
|---|---|---|---|
|  | Metal, 2 axes | 1 U | Quick-fixing 0 465 22 |
| | | 2 U | 0 465 23 |
| | Plastic with brushes, snap on | 1 U | 0 465 28 |
| | | 2 U | 0 465 29 |
| | Metal with brushes | 1 U | Quick-fixing 0 465 30 |
| | | 2 U | 0 465 31 |
| | Plastic blanking plate,<br>snap on | 1 U | 0 465 32 |
| | | 2 U | 0 465 33 |
| | Metal blanking plate | 1 U | Quick-fixing 0 465 38 |
| | | 2 U | 0 465 39 |
| | | 3 U | 0 465 40 |

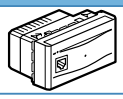
| LCS² ZONE DISTRIBUTION BOXES (see p. 78, 81, 83, 85, 88, 90, 103) | | | LCS² cat. 6$_A$ | LCS² cat. 6 | LCS² cat.5e |
|---|---|---|---|---|---|
|  | Zone distribution box Equipped with 12 x RJ 45 connectors | STP | 0 335 49 | 0 335 46 | - |
| | | FTP | - | 0 335 45 | - |
| | | UTP | - | 0 335 44 | - |
| | Units of 6 x RJ 45 connectors | STP | - | 0 335 66 | - |
| | | FTP | - | 0 335 65 | 0 335 55 |
| | | UTP | 0 335 77 | 0 335 64 | 0 335 54 |
| | Fibre optic accessory | | - | 0 335 20 | 0 335 20 |
| | Zone distribution box - To be fitted with 4 units | | - | 0 335 40 | 0 335 40 |

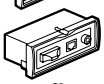
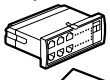
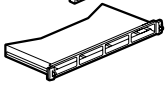
Cords specifically for zone distribution boxes
**see p. 82, 85, 89**



# Selection chart for equipment and cabinets

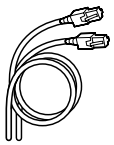
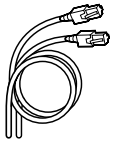
**configure your LCS² system (continued)**

| PLAIN ARTEOR RJ 45 SOCKETS (see p. 81, 82) | | | LCS² cat. 6$_A$ | LCS² cat. 6 | LCS² cat.5e |
|---|---|---|---|---|---|
|  | 1 Module | STP | 5 734 32 | 5 723 23 | - |
| | | FTP | - | 5 723 22 | 5 734 30 |
| | | UTP | 5 723 49 | 5 734 28 | 5 734 29 |
|  | 2 Module | STP | - | 5 723 17 | - |
| | | FTP | - | 5 723 16 | - |
| | | UTP | - | 5 734 74 | 5 734 75 |
|  | 1 Module with Orange Shutter | STP | 5 723 51 | - | - |
| | | FTP | - | - | - |
| | | UTP | 5 723 58 | 5 723 54 | - |
|  | 1 Module with Green Shutter | STP | 5 723 52 | - | - |
| | | FTP | - | - | - |
| | | UTP | 5 723 59 | 5 723 55 | - |
|  | With Controlled Access | STP | 5 723 50 | - | - |
| | | FTP | - | - | - |
| | | UTP | 5 723 57 | 5 723 53 | - |
|  | Copper Feedthroughs | STP | - | - | - |
| | | FTP | - | 5 723 33 | 5 723 32 |
| | | UTP | - | 5 723 31 | 5 723 30 |
|  | Retractable | STP | - | - | - |
| | | FTP | - | - | - |
| | | UTP | - | 5 723 39 | - |
| **WI-FI ACCESS POINTS (see p. 96)** | | | | | |
|  | Wall-mounted manageable Wi-Fi access points | With RJ 45 socket, dual-band and dual-radio | 5 723 76 | - | - |
| | | Dual-band and dual-radio | 5 728 77 | - | - |
|  | Manageable Wi-Fi access point (false ceiling) | | 0 335 21 | 0 335 21 | 0 335 21 |
| | Manageable Wi-Fi access point (surface-mounted) | | 0 335 22 | 0 335 22 | 0 335 22 |
| | Centralised configuration software | | 0 335 24 | 0 335 24 | 0 335 24 |
| | PoE injector | 4 inputs/4 outputs | 0 335 01 | 0 335 01 | 0 335 01 |
| | | 1 input/1 output | 0 327 37 | 0 327 37 | 0 327 37 |

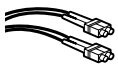
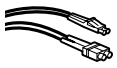
| FIBRE OPTIC EQUIPMENT (see p. 99) | | Singlemode | Multimode |
|---|---|---|---|
|  | LC units | For 6 fibres | 0 335 13 | 0 335 18 |
| | | High density - For 12 fibres | - | 0 335 19 |
|  | SC units | For 6 fibres | 0 335 12 | 0 335 17 |
|  | ST unit | For 6 fibres | - | 0 335 16 |
|  | Copper/fibre optic converters | 10/100 base T to 10/100 base SX | - | 0 335 06 |
| | | 1000 base T to 1000 base SX/LX | - | 0 335 07 |
|  | Switch units | 6 x RJ 45 ports + 1 LC type optic port | 0 335 05 | |
|  | Fibre optic racks 1 U - For 4 fibre optic units | | 0 335 10 | |
| | Fibre optic cassettes for patch panel | | 0 335 11 | |

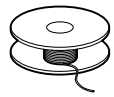
# Selection chart for equipment and cabinets

**configure your LCS² system (continued)**

| RJ 45 PATCH CORDS AND USER CORDS (see p. 80, 84, 89) | | | | | | LCS² cat. 6$_A$ | LCS² cat. 6 | LCS² cat. 5e |
|---|---|---|---|---|---|---|---|---|
|  | PVC | S/FTP | Impedance 100 ohms | 1 m | | 0 517 80 | 0 517 52 | - |
| | | | | 2 m | | 0 517 81 | 0 517 53 | - |
| | | | | 3 m | | 0 517 82 | 0 517 54 | - |
| | | | | 5 m | | 0 517 83 | 0 517 55 | - |
| | | F/UTP | Impedance 100 ohms | 1 m | | - | 0 517 62 | 0 516 40 |
| | | | | 2 m | | - | 0 517 63 | 0 516 41 |
| | | | | 3 m | | - | 0 517 64 | 0 516 42 |
| | | | | 5 m | | - | 0 517 65 | 0 516 43 |
| | | U/UTP | Impedance 100 ohms | 1 m | | 0 518 82 | 0 517 72 | - |
| | | | | 2 m | | 0 518 83 | 0 517 73 | - |
| | | | | 3 m | | 0 518 84 | 0 517 74 | - |
| | | | | 5 m | | 0 518 85 | 0 517 75 | - |
|  | LSOH | S/FTP | Impedance 100 ohms | 1 m | RAL 3020 | 0 518 70 | - | - |
| | | | | | RAL 6026 | 0 518 66 | - | - |
| | | | | 2 m | RAL 3020 | 0 518 71 | - | - |
| | | | | | RAL 6026 | 0 518 67 | - | - |
| | | | | 3 m | RAL 3020 | 0 518 72 | - | - |
| | | | | | RAL 6026 | 0 518 68 | - | - |
| | | | | 5 m | RAL 3020 | 0 518 73 | - | - |
| | | | | | RAL 6026 | 0 518 69 | - | - |
| | | F/UTP | Impedance 100 ohms | 1 m | RAL 3020 | - | 0 518 54 | - |
| | | | | | RAL 6026 | - | 0 518 50 | - |
| | | | | 2 m | RAL 3020 | - | 0 518 55 | - |
| | | | | | RAL 6026 | - | 0 518 51 | - |
| | | | | 3 m | RAL 3020 | - | 0 518 56 | - |
| | | | | | RAL 6026 | - | 0 518 52 | - |
| | | | | 5 m | RAL 3020 | - | 0 518 57 | - |
| | | | | | RAL 6026 | - | 0 518 53 | - |
| | | U/UTP | Impedance 100 ohms | 1 m | RAL 3020 | 0 518 78 | 0 518 62 | - |
| | | | | | RAL 6026 | 0 518 74 | 0 518 58 | - |
| | | | | 2 m | RAL 3020 | 0 518 79 | 0 518 63 | - |
| | | | | | RAL 6026 | 0 518 75 | 0 518 59 | - |
| | | | | 3 m | RAL 3020 | 0 518 80 | 0 518 64 | - |
| | | | | | RAL 6026 | 0 518 76 | 0 518 60 | - |
| | | | | 5 m | RAL 3020 | 0 518 81 | 0 518 65 | - |
| | | | | | RAL 6026 | 0 518 77 | 0 518 61 | - |

| COPPER CABLES (305 OR 500 M REELS) (see p. 80, 84, 89) | | | | | | |
|---|---|---|---|---|---|---|
|  | S/FTP | 4 pairs | 500 m | 0 327 77 | - | - |
| | SF/UTP | 4 pairs | 500 m | - | 0 327 57 | - |
| | | 2 x 4 pairs | 500 m | - | 0 328 59 | - |
| | F/UTP | 4 pairs | 305 m | - | 0 328 56 | 0 327 52 |
| | | | 500 m | 0 327 78 | 0 327 56 | 0 328 50 |
| | | 2 x 4 pairs | 500 m | 0 328 78 | 0 327 76 | 0 327 74 |
| | U/UTP | 4 pairs | 305 m | - | 0 327 54 | 0 327 50 |
| | | | 500 m | - | 0 328 61 | 0 328 53 |
| | | 2 x 4 pairs | 500 m | - | 0 328 63 | 0 328 55 |

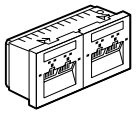
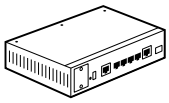
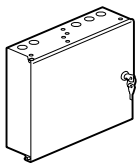
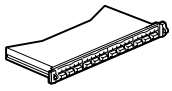
| FIBRE OPTIC PATCH CORDS (see p. 105) | | | OS1/OS2 (UPC) singlemode 9/125 µm | OM4 multimode 50/125 µm | OM3 multimode 50/125 µm |
|---|---|---|---|---|---|
|  | SC/SC duplex cords | 1 m | 0 326 00 | 0 326 30 | 0 326 09 |
| | | 2 m | 0 326 01 | 0 326 31 | 0 326 10 |
| | | 3 m | 0 326 02 | 0 326 32 | 0 326 11 |
|  | SC/LC duplex cords | 1 m | 0 326 03 | - | 0 326 12 |
| | | 2 m | 0 326 04 | - | 0 326 13 |
| | | 3 m | 0 326 05 | - | 0 326 14 |
|  | LC/LC duplex cords | 0.5 m | 0 326 28 | 0 326 33 | - |
| | | 1 m | 0 326 06 | 0 326 34 | 0 326 15 |
| | | 2 m | 0 326 07 | 0 326 35 | 0 326 16 |
| | | 3 m | 0 326 08 | 0 326 36 | 0 326 17 |
| | | 5 m | 0 326 29 | 0 326 37 | - |

| OPTICAL CABLES (REEL) (see p. 97) | | | | | | |
|---|---|---|---|---|---|---|
|  | Indoor/Outdoor | 6 fibres | | 0 325 12 | 0 326 65/66 | 0 325 10 |
| | | 12 fibres | Loose tube | 0 325 14 | - | - |
| | | | Tight buffer | 0 325 50 | 0 326 67 | 0 325 11 |
| | | 24 fibres | Loose tube | 0 325 51 | - | 0 325 53 |
| | | | Tight buffer | - | 0 326 68 | 0 325 52 |
| | Outdoor, reinforced steel, anti-rodent | 6 fibres | | 0 325 13 | - | - |
| | | 12 fibres | | 0 325 15 | - | - |

Fibre optic cords and cables
**Customised solutions, p. 97**

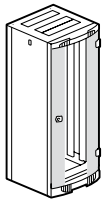
# Selection chart for equipment and cabinets

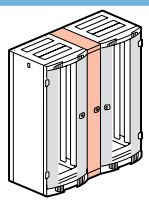
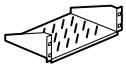
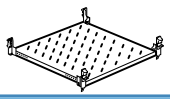
**for FTTO infrastructure**

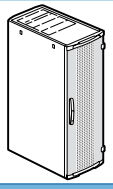
| | EQUIPMENT FOR INDIVIDUAL WORKSTATIONS | | | EQUIPMENT FOR SHARED WORKSTATIONS | | |
|---|---|---|---|---|---|---|
|   | **RJ 45 socket, cat. 6 - FTP - 2 modules** | | 0 765 65 | **Fibre optic/copper converter switch** | | 0 779 05 |
| | **Cat. 6 cords - RJ 45/stripped - F/UTP** | **Length 8 m** | 0 517 96 | **Power supply for fibre optic/ copper switch** | | 0 779 06 |
| | | **Length 15 m** | 0 517 97 | **OM3 multimode optical cord 50/125 µm - SC/LC** | **3 m** | 0 326 14 |
| | **Active zone box** | | 0 326 80 | | **SC/LC > 3 m** | consult our customised offer |
| | **False ceiling support for active zone box** | | 0 326 81 | **Ready-assembled zone distribution box** | | 0 335 43 |
| | **Raised access floor support for active zone box** | | 0 326 82 | | | |
| **ZONE BOX <-> FLOOR DISTRIBUTOR LINK** | | | | | | |
|  | **Fast-connection connector 50 µm OM3/OM4 900 µm - LC/UPC** | | 0 326 58 | **Fast-connection connector 50 µm OM3/OM4 900 µm - SC/UPC** | | 0 326 57 |
| | **Pigtail 10 Gb - OM3 - 50/125 µm - LC** | | 0 326 23 | **Pigtail 10 Gb - OM3 - 50/125 µm - SC** | | 0 326 22 |
| | **OM3 multimode fibre optic cable 50/125 µm - 6 fibres** | | | | | 0 325 10 |
| **EQUIPMENT FOR FLOOR DISTRIBUTOR** | | | | | | |
|  | **Modular cabinet** | | | | | 0 462 90 |
| | **Fibre optic floor distributor cabinet - ready-assembled** | | | | | 0 462 91 |
| | **Fast-connection connector - 50 µm OM3/OM4 900 µm - SC/UPC** | | | | | 0 326 57 x 2 |
| | **Pigtail 10 Gb - OM3 - 50/125 µm - SC** | | | | | 0 326 22 x 2 |
| **FLOOR DISTRIBUTOR <-> BUILDING DISTRIBUTOR LINK** | | | | | | |
|  | **Pigtail 10 Gb - SC (for input) - OM3 - 50/125 µm - SC (incoming)** | | | | | 0 326 22 |
| | **OM3 multimode fibre optic cable 50/125 µm - 24 fibres** | | | | | 0 325 52 |
| | **Pigtail 10 Gb - SC (for output) - OM3 - 50/125 µm - SC (outgoing)** | | | | | 0 326 22 |
| **EQUIPMENT IN THE GENERAL BUILDING DISTRIBUTOR** | | | | | | |
|  | **19" fibre optic drawer - equipped with SC units** | | | | | 0 335 09 |
| | **Fast-connection connector - 50 µm OM3/OM4 900 µm - SC/UPC** | | | | | 0 326 57 |
| | **Pigtail 10 Gb - OM3 - 50/125 µm - SC** | | | | | 0 326 22 |

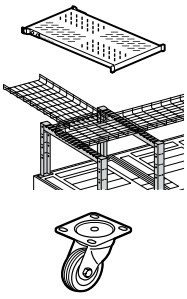
# Selection chart for equipment and cabinets

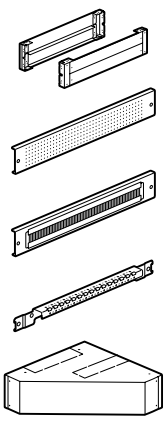
**configure your LCS² system**

| LCS² 19" CABINETS (see p. 107) | | | | Depth 600 mm | Depth 800 mm | Depth 1000 mm |
|---|---|---|---|---|---|---|
|  | Single front door | 24 U | Width 600 mm | 0 463 00 | - | - |
| | | 29 U | Width 600 mm | 0 463 06 | - | - |
| | | 33 U | Width 600 mm | 0 463 12 | - | - |
| | | 42 U | Width 600 mm | 0 463 18 | 0 463 19 | - |
| | | | Width 800 mm | 0 463 21 | 0 463 22 | 0 463 23 |
| | | 42 U extension(1) | Width 600 mm | 0 463 30 | - | - |
| | | | Width 800 mm | - | 0 463 33 | - |
| | | 47 U | Width 800 mm | - | 0 463 28 | 0 463 29 |
| | Double front door | 42 U | Width 800 mm | 0 463 41 | 0 463 42 | 0 463 43 |

| EQUIPMENT FOR LCS² 19" CABINETS (see p. 107, 111) | | | For cabinet depth 600 mm | For cabinet depth 800 mm | For cabinet depth 1000 mm |
|---|---|---|---|---|---|
|  | Cabling unit for 42 U cabinet | | 0 463 34 | 0 463 35 | - |
| | Direct baying kit | | 0 463 37 | 0 463 38 | 0 463 39 |
| | Fixed shelf<br>Projecting fixing on 2 x 19" uprights, 2 U | Depth 115 mm | 0 465 00 | 0 465 00 | 0 465 00 |
| | | Depth 200 mm | 0 465 01 | 0 465 01 | 0 465 01 |
| | | Depth 360 mm | 0 465 02 | 0 465 02 | 0 465 02 |
| | Fixed shelf<br>Fixing on 4 x 19" uprights | 50 kg max., 1 U | 0 465 05 | 0 465 06 | 0 465 07 |
| | | 100 kg max., 1 U | - | - | 0 465 17 |
|  | Telescopic shelf, fixing on 4 x 19" uprights, 1 U | | 0 465 08 | 0 465 09 | 0 465 10 |
|  | Set of 2 fixed runners | | 0 465 11 | 0 465 12 | 0 465 13 |

| LCS² 19" SERVER CABINETS (see p. 107) | | | Depth 1000 mm |
|---|---|---|---|
|  | 42 U | Width 600 mm | 0 463 85 |
| | | Width 800 mm | 0 463 86 |

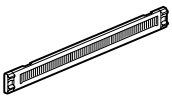
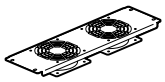
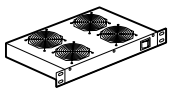
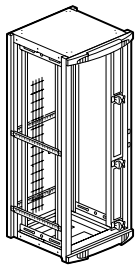
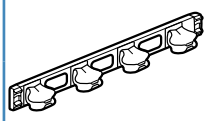
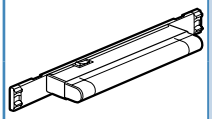
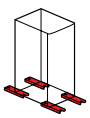
| EQUIPMENT FOR LCS² 19" SERVER CABINETS (see p. 107, 111) | | | For cabinet depth 1000 mm |
|---|---|---|---|
|  | Baying kit | | 0 463 39 |
| | Fixed shelf<br>Projecting fixing on 2 x 19" uprights, 2 U | Depth 115 mm | 0 465 00 |
| | | Depth 200 mm | 0 465 01 |
| | | Depth 360 mm | 0 465 02 |
| | Fixed shelf<br>Fixing on 4 x 19" uprights | 50 kg max., 1 U | 0 465 07 |
| | | 100 kg max., 1 U | 0 465 17 |
| | Telescopic shelf<br>Fixing on 4 x 19" uprights | 50 kg max., 1 U | 0 465 10 |
| | | 100 kg max., 2 U | 0 465 18 |
| | Set of 2 fixed slidders | | 0 465 13 |
| | Cable guide support | | 0 464 79 (+ 0 464 78) |
| | Set of 4 casters, 500 kg max. | | 0 464 82 |

| PLINTH FOR LCS² 19" CABINETS AND SERVER CABINETS (see p. 109) | | | |
|---|---|---|---|
|  | Plinth kit, height 100 mm | For cabinet width 600 mm | 0 464 50 |
| | | For cabinet width 800 mm | 0 464 51 |
| | Plinth kit, height 200 mm | For cabinet width 600 mm | 0 464 52 |
| | | For cabinet width 800 mm | 0 464 53 |
| | Set of 2 solid side traps | For cabinet depth 600 mm | 0 464 54(2) |
| | | For cabinet depth 800 mm | 0 464 56(2) |
| | | For cabinet depth 1000 mm | 0 464 58(2) |
| | Ventilated trap, height 100 mm | For cabinet width/depth 600 mm | 0 464 60 |
| | | For cabinet width/depth 800 mm | 0 464 61 |
| | Trap with brushes, height 100 mm | For cabinet width/depth 600 mm | 0 464 62 |
| | | For cabinet width/depth 800 mm | 0 464 63 |
| | Cross bar | For cabinet depth 600 mm | 0 476 93 |
| | | For cabinet depth 800 mm | 0 476 94 |
| | | For cabinet depth 1000 mm | 0 476 95 |
| | Linking interface | For cabinet depth 600 mm | 0 464 66 |
| | Plinth for cabling unit, trap height 100 mm | | 0 464 64(2) |

1: Cabinets with no side panels supplied with baying kit - 2: Double the number of traps for a height of 200 mm

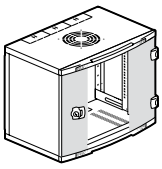
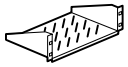
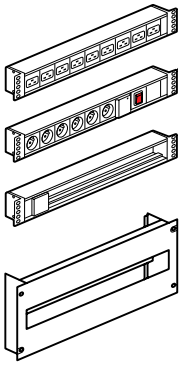
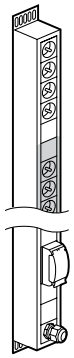
# Selection chart for equipment and cabinets

**configure your LCS² system (continued)**

| | | | |
|---|---|---|---|
| **CABLE ENTRIES FOR LCS² 19" CABINETS AND SERVER CABINETS (see p. 110)** | | | |
|  | **Plastic plate with brushes, snap on** | **1 U** | 0 465 28 |
| | | **2 U** | 0 465 29 |
|  | **Metal plate with brushes** | **1 U** | 0 465 30 |
| | | **2 U** | 0 465 31 |
| **THERMAL MANAGEMENT FOR LCS² 19" CABINETS AND SERVER CABINETS (see p. 110)** | | | |
|  | **19" 3 U plate with 230 V ~ fans** | **2 fans** | 0 464 87 |
| | | **3 fans** | 0 464 88 |
|  | **1 U ventilation drawer** | **2 fans, depth 150 mm** | 0 464 89 |
| | | **4 fans, depth 300 mm** | 0 464 90 |
| | **Thermostat** | **Adjustable from 5 to 60°C** | 0 348 48 |
| **CABLE MANAGEMENT FOR LCS² 19" CABINETS AND SERVER CABINETS (see p. 110, 111)** | | | |
| | **Set of 3 cable management supports** | **For cabinet width/depth 600 mm** | 0 464 72 |
| | | **For cabinet width/depth 800 mm** | 0 464 73 |
| | | **For cabinet depth 1000 mm** | 0 464 74 |
|  | **Flat cable guide** | **For 33 U cabinet** | 0 464 76 |
| | | **For 42 U cabinet** | 0 464 77 |
| | **U-shaped cable guide, 3 m** | **Width 200 mm** | 0 464 69 |
| | | **Width 400 mm** | 0 464 70 |
| | **Vertical cable management grille** | **For 42 U cabinet, width 800 mm** | 0 331 35 |
| | **Vertical cable manager** | **For 42 U cabinet, width 800 mm** | 0 464 80 |
| | **Patch extension** | **For 42 U cabinet, width 800 mm** | 0 464 81 |
|  | **19" management panels, 2 axes** | **1 U** | 0 465 22 |
| | | **2 U** | 0 465 23 |
| **ACCESSORIES FOR LCS² 19" CABINETS AND SERVER CABINETS (see p. 110, 111)** | | | |
|  | **Accessories** | **230 V∿ lighting kit, 1 U** | 0 464 85 |
| | | **Anti-tilt kit** | 0 464 84 |
| | | **Floor fixing kit** | 0 464 86 |
|  | | **Set of 4 casters - 380 kg max.** | 0 464 83 |
| | **Vertical PDU supports** | **For 42 U cabinets** | 0 465 75 |
| | | **For 47 U cabinets** | 0 465 76 |

# Selection chart for equipment and cabinets

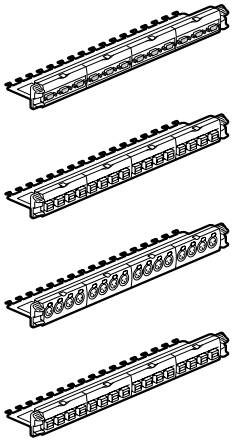
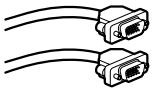
**configure your LCS² system (continued)**

| LCS² 19" FREESTANDING CABINETS AND EQUIPMENT (see p. 113) | | | | FIXED | | PIVOTING |
|---|---|---|---|---|---|---|
| | | | | Depth 400 mm | Depth 580 mm | Depth 600 mm |
|  | 6 U | Height 350 mm x width 600 mm | | 0 462 00 | - | - |
| | 9 U | Height 500 mm x width 600 mm | | 0 462 01 | 0 462 06 | 0 462 11 |
| | 12 U | Height 600 mm x width 600 mm | | 0 462 02 | 0 462 07 | 0 462 12 |
| | 16 U | Height 800 mm x width 600 mm | | 0 462 03 | 0 462 08 | 0 462 13 |
| | 21 U | Height 1000 mm x width 600 mm | | - | 0 462 09 | 0 462 14 |
|  | Fixed shelves | Depth 115 mm | | 0 465 00 | 0 465 00 | 0 465 00 |
| | | Depth 200 mm | | 0 465 01 | 0 465 01 | 0 465 01 |
| | | Depth 360 mm | | - | 0 465 02 | 0 465 02 |
|  | Equipment | Cable entry plate with brush | | - | - | 0 462 55 |
| | | Cable management ring | | 0 465 41[1] | 0 465 41/42 | - |
|  | | 230 V ~ fan | | 0 462 60 | 0 462 60 | 0 462 60 |
| | | Thermostat | | 0 348 48 | 0 348 48 | 0 348 48 |
| | | Set of 4 casters | | - | - | 0 462 64 |
| **19" POWER DISTRIBUTION UNITS (PDUs) (see p. 116, 117)** | | | | | | |
|  | PDU 2P+E | 12 x C13 sockets | | 0 465 51 | | |
| | | 9 x C19 sockets | | 0 465 52 | | |
| | | 5 x 2P+E sockets | British standard | 6 339 00 | | |
| | | 6 x 2P+E sockets | British standard | 0 465 65 | | |
| | PDU with surge protector | - | | - | | |
| | PDU to be equipped | Takes 16 Arteor modules | | 0 332 79 | | |
| | Multiapplication 19" rail DIN kit | Rail DIN kit with front cover | | 0 465 46 | | |
| | | Rear cover | | 0 465 47 | | |
| **VERTICAL POWER DISTRIBUTION UNITS (PDUs) (see p. 116)** | | | | | | |
|  | PDU 2P+E | 24 x C13 sockets | | 0 465 81[2] | | |
| | | 16 x C13 + 6 x C19 sockets<br>Cord with IEC 60309 plug - 16 A | | 0 465 84[2] | | |
| | | 24 x C13 + 3 x C19 sockets<br>Cord with IEC 60309 plug - 32 A<br>3-phase supply | | 0 465 85[2] | | |

1. Except for 6 U cabinet
2: Mounting in LCS² cabling and server cabinet with mounting bracket Cat.Nos 0 465 75/76. Mounting in Varicon-L server cabinet with 2 mounting brackets Cat.Nos 6 466 55/57

LCS² 10" wall-mounting
**See p. 114**

# Selection chart for panels and cords for audio/video applications

| ASSEMBLED PANELS, AUDIO/VIDEO APPLICATIONS (see p. 122) | | |
|---|---|---|
|  | **19" panel equipped with HD 15 units** | 0 335 98 |
| | **19" panel equipped with HDMI units** | 0 335 97 |
| | **19" panel equipped with XLR units** | 0 335 96 |
| | **19" panel equipped with 9-way SUB-D units** | 0 335 99 |
| **CORDS FOR AUDIO/VIDEO APPLICATIONS (see p. 122)** | | |
|  | **HD 15 cord - 10 m** | 0 517 23 |
| | **HD 15 cord + 3.5 mm jack - 2 m** | 0 517 22 |
| | **HDMI 1.4 cord - 10 m** | 0 517 20* |
| | **HDMI 1.4 cord - 5 m** | 0 517 27* |
| | **HDMI 1.4 cord - 1.5 m** | 0 517 26* |
| | **XLR cord - 10 m** | 0 517 24 |
| | **9-way SUB-D cord - 10 m** | 0 517 25 |
| **CABLES FOR AUDIO/VIDEO APPLICATIONS (see p. 122)** | | |
|  | **VGA cable - 20 m** | 0 327 81 |
| | **HDMI cable - 20 m** | 0 327 80 |

* To be introduced shortly.

Arteor audio/video sockets
**p. 120**

LCS² ZONE
DISTRIBUTION BOXES

# Consolidation and redistribution made easy

Complete flexibility with the LCS² zone boxes: centralisation of connections close to the workstation, copper and fibre optics can be used together.

- Flexible installation with lines in reserve meet future requirements quickly.
- Guaranteed performance across the whole LCS² system.
- Fast, reliable connection to the LCS² zone box with sockets with copper and fibre optic feedthrough and RJ 45/RJ 45 cords.

N Available in cat. 6A

## Legrand cabling system LCS² category $6_A$ - patch panels, connector units

0 335 73

0 335 90

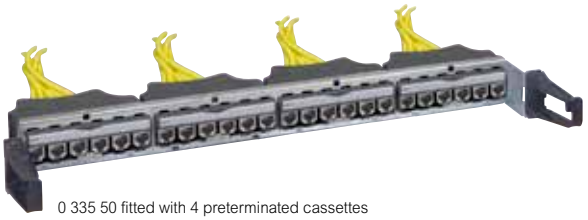
0 335 76

Connector cat. $6_A$ shielded STP

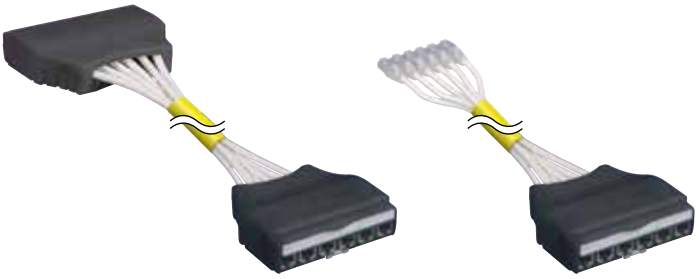
| Pack | Cat.Nos | |
|---|---|---|
| | | **Patch panel cat. $6_A$ 24 x RJ 45 connectors**<br>Panel supplied with quick-fixing system<br>Universal mounting for all freestanding or wall-mounted cabinets<br>Panel ensures automatic earthing of each connector<br>Fitted with rear cable guide to hold cables during maintenance<br>Fitted with 4 units of 6 x LCS² RJ 45 cat. $6_A$ quick-fixing crimp connectors, with wiring schemes T 568 A and T 568 B<br>Supplied with numbered colour labels<br>Conform to standards ISO/IEC 11801 Ed. 2.0, amendment 2, EN 50173-2 and TIA/EIA 568C<br>19" panel - 1 U |
| 1 | 0 335 84 | UTP panel - 8 contacts |
| 1 | 0 335 85 | UTP high density panel - 8 contacts |
| 1 | 0 335 73 | STP - metal shielding 360° |
| 1 | 0 335 86 | STP high density panel - 360° metal shielding |
| | | **Modular panel**<br>Panel supplied with quick-fixing system<br>Universal mounting for all freestanding or wall-mounted cabinets<br>Panel ensures automatic grounding of each connector<br>Fitted with rear cable guide to hold cables during maintenance<br>Modular empty panel for up to 4 units<br>Takes the following equipment:<br>- units of 6 x LCS² RJ 45 connectors<br>- telephone inlet units<br>- fibre optic units<br>- PoE injector units<br>- video streaming units<br>- switch units<br>- telephone/Ethernet doubler units<br>- copper/fibre optic converter units<br>- blanking plates |
| 1 | 0 335 90 | 19" panel - 1 U |
| | | **Units of 6 x RJ 45 connectors cat. $6_A$**<br>Fitted with 6 x LCS² RJ 45 cat. $6_A$ quick-fixing crimp connectors, with wiring schemes T 568 A and T 568 B<br>Supplied with colour labels<br>Conform to standards ISO/IEC 11801 Ed. 2.0, amendment 2, EN 50173-2 and TIA/EIA 568C |
| 2 | 0 335 77 | UTP unit - 8 contacts |
| 2 | 0 335 76 | STP unit - metal shielding 360° |
| 10 | 0 335 91 | Blanking plate for 19" panel - Black |

# Legrand cabling system LCS²

**solution preterminated copper**



0 335 50 fitted with 4 preterminated cassettes



0 328 30 0 328 33

| Pack | Cat.Nos | **Modular high density panel** |
|---|---|---|
| | | Panel specifically for using preterminated cassettes (maximum 4)<br>Fitted with:<br>- a side cord management accessory (does not require the use of feedthrough panels)<br>- soluclip for automatic fixing (no screws) on the cabinet uprights |
| 1 | 0 335 50 | 19" panel - 1 U |
| | | **Preterminated cassettes** |
| | | Clip directly onto panels Cat.No 0 335 50 Links factory tested with test report provided |
| | | **Cassette-cassette termination**<br>Cat. 6A S/FTP copper band 6 links (trunk) |
| 1 | 0 328 30 | Length 6 m |
| 1 | 0 328 31 | Length 9 m |
| 1 | 0 328 32 | Length 12 m |
| | | **Cassette-RJ 45 cord termination**<br>Cat. 6A S/FTP copper band 6 links (trunk) |
| 1 | 0 328 33 | Length 6 m |
| 1 | 0 328 34 | Length 9 m |
| 1 | 0 328 35 | Length 12 m |

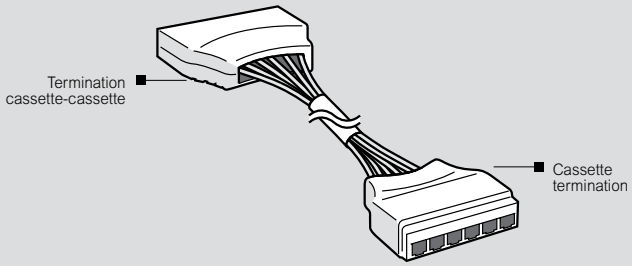
# Customised solutions

**solution preterminated copper**

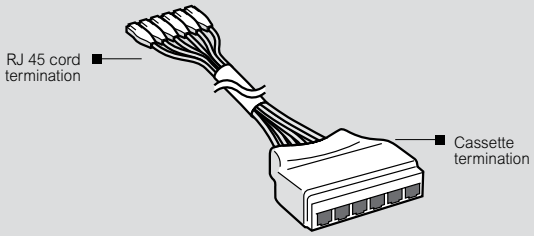
## Choosing the termination and the cord length

**Choose the termination**

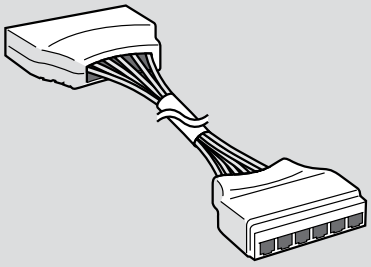
Cassette-cassette termination



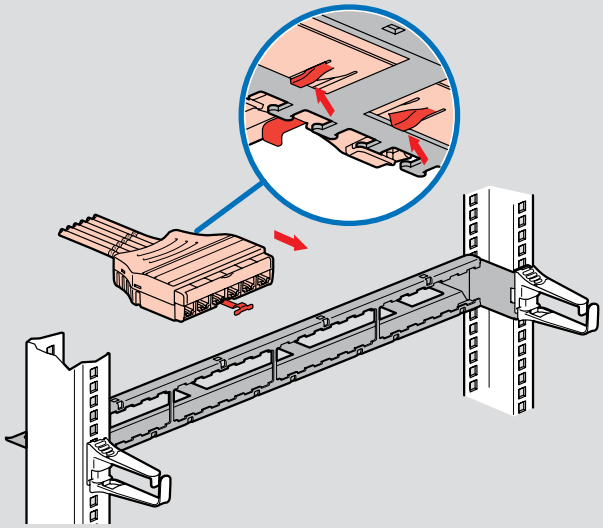

Cassette-RJ 45 cord termination




**Choose the cord length: 1 to 70 m**



**Mount the cassette for the snap on system on the panel**



# Legrand cabling system LCS² category $6_A$ - cables

0 327 77

| Pack | Cat.Nos | Cables for cat. $6_A$ LANs |
|---|---|---|
| | | Cables with 4 pairs or 2 x 4 twisted pairs 100 ohms<br>LSZH sleeve: no halogen<br>Colour code TIA/EIA<br>Conform to standards ISO/IEC 11801<br>Ed. 2.0, EN 50173-1 and TIA/EIA 568C<br>Performance 500 MHz |
| | LSZH | **U/UTP - 4 pairs**<br>Performance 500 MHz |
| 305 | 0 327 87N | Length 305 m<br>Supplied on reel<br>Weight 23 kg<br>Yellow RAL 1021 |
| 500 | 0 327 87 | Length - 500 m<br>Supplied on reel.<br>Weight 25 Kg.<br>RAL 1018 |
| | | **F/UTP - 4 pairs**<br>Performance 500 MHz |
| 500[1] | 0 327 78 | Length 500 m<br>Supplied on reel<br>Weight 25 kg<br>Yellow RAL 1018 |
| | | **F/UTP - 2x4 pairs**<br>Performance 500 MHz |
| 500[1] | 0 328 78 | Length 500 m<br>Supplied on reel<br>Weight 65 kg<br>Yellow RAL 1018 |
| | | **S/FTP - 4 pairs**<br>Performance 600 MHz |
| 500[1] | 0 327 77 | Length 500 m<br>Supplied on reel<br>Weight 30 kg<br>Yellow RAL 1018 |

1: in metre(s)

# Legrand cabling system LCS² category $6_A$ - cords

0 517 82

0 518 90

| Pack | Cat.Nos | RJ 45 cat. $6_A$ patch cords and user cords |
|---|---|---|
| | | RJ 45 - RJ 45 right<br>Conform to standards ISO/IEC 11801<br>Ed. 2.0, EN 50173-1 and TIA/EIA 568C |
| | PVC | **U/UTP unscreened impedance 100 Ω** |
| 5 | 0 518 82 | Length 1 m |
| 5 | 0 518 83 | Length 2 m |
| 5 | 0 518 84 | Length 3 m |
| 5 | 0 518 85 | Length 5 m |
| | LSZH | |
| 5 | 0 518 78 | Length 1 m |
| 5 | 0 518 79 | Length 2 m |
| 5 | 0 518 80 | Length 3 m |
| 5 | 0 518 81 | Length 5 m |
| 5 | 0 518 74 | Length 1 m |
| 5 | 0 518 75 | Length 2 m |
| 5 | 0 518 76 | Length 3 m |
| 5 | 0 518 77 | Length 5 m |
| | PVC | **S/FTP shielded impedance 100 Ω** |
| 5 | 0 517 80 | Length 1 m |
| 5 | 0 517 81 | Length 2 m |
| 5 | 0 517 82 | Length 3 m |
| 5 | 0 517 83 | Length 5 m |
| | LSZH | |
| 5 | 0 518 70 | Length 1 m |
| 5 | 0 518 71 | Length 2 m |
| 5 | 0 518 72 | Length 3 m |
| 5 | 0 518 73 | Length 5 m |
| 5 | 0 518 66 | Length 1 m |
| 5 | 0 518 67 | Length 2 m |
| 5 | 0 518 68 | Length 3 m |
| 5 | 0 518 69 | Length 5 m |

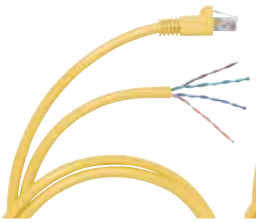
| Pack | Cat.Nos | Kit for identification |
|---|---|---|
| 1 | 0 518 90 | Kit of 200 coloured rings (red, green, yellow and blue) for identifying RJ 45 cords<br>Snap onto patch cords |

# Legrand cabling system LCS² category $6_A$

**zone distribution boxes, feed through sockets and cords specifically for zone distribution boxes**

0 335 49

0 335 40



0 517 86

0 515 23

| Pack | Cat.Nos | Zone distribution boxes |
|---|---|---|
| | | For ELV distribution in a zone Fitted with 2 units of 6 x cat. $6_A$ RJ 45 LCS² connectors and adaptability of the installation<br>Installed on false ceiling or false floor<br>Connect to the patch panel or the floor cabinet<br>Connection to workstation for RJ 45 cords<br>Can take switch Cat.No 0 335 02 or PoE injector Cat.No 0 335 01 or 6-connector units Cat.No 0 335 76<br>Conform to standards UTE C 15-900, NF C 15-100, NF C 20-730, EN 50-174.2, CEI 60950, ISO/IEC 11801 Ed. 2.0, EN 50173-2 and TIA/EIA 568<br>Colour code TIA/EIA 568 A and C<br>Cords and cables: ISO 11801 Ed.2.0, EN 50173-1, TIA/EIA 568<br>Technical characteristics:<br>- polycarbonate PC hood<br>- polypropylene PP base<br>- RAL 7035<br>- hold connector units in place in the box: 100 N<br>- cables anchored on support using Colring cable ties |
| | | **Cat. $6_A$ zone distribution boxes**<br>Fitted with 2 units of 6 x LCS² connectors RJ 45 cat. $6_A$ and RJ 45 blanking plates<br>Supplied with Colring cable ties |
| 2 | 0 335 49 | STP |
| | | **Self-assembly zone distribution box** |
| 1 | 0 335 40 | Used for mounting LCS² RJ 45 cat. $6_A$ (p. 78), cat. 6 (p. 85) and cat. 5e (p. 91) connector units, fibre optic accessories or blanking plates |

| Pack | Cat.Nos | Cat. $6_A$ cords - RJ 45/stripped |
|---|---|---|
| | | RJ 45 - straight stripped<br>Clip into zone distribution boxes and connect to an RJ45 socket LCS² connector on the stripped side<br>Cords prepared in factory, "ready for wiring"<br>Conform to standards ISO/IEC 11801 Ed. 2.0 (2011), EN 50173-1 and EIA/TIA 568 C2 |
| | Yellow RAL 1018 | **S/FTP screened impedance 100 Ω** |
| 4 | 0 517 86 | Length 8 m |
| 4 | 0 517 87 | Length 15 m |
| 4 | 0 517 88 | Length 20 m |

| Pack | Cat.Nos | Cat. $6_A$ cords - RJ 45/RJ 45 |
|---|---|---|
| | | For direct connection via RJ 45 male plug to the zone distribution box and to the RJ 45 socket with copper feedthrough, to ensure:<br>- Safe connection<br>- Speed and reliability of connection |
| | Yellow RAL 1018 | **S/FTP screened impedance 100 Ω** |
| 4 | 0 515 23 | Length 8 m |
| 4 | 0 515 24 | Length 15 m |
| 4 | 0 515 25 | Length 20 m |

| | | Cat. $6_A$ feedthrough sockets |
|---|---|---|
| | | Easy connection at the rear through simply inserting a male plug<br>Provides network access for the RJ 45 socket<br>Used to create cat. 6 and cat. 5e links<br>Conforming to standards ISO 11801 Ed.2, EN 50173-1 and EIA/TIA 568 in the context of use with zone distribution boxes<br>Multidirectional cord entry<br>Installation possible in all supports min. depth 40 mm 2 modules |
| | | **Cat. $6_A$ STP** |
| 10 | 0 786 28 | ○ White |
| 10 | 0 786 29 | ● Aluminium |

# Legrand cabling system LCS² category $6_A$

**RJ 45 sockets**

5 734 32

5 723 57

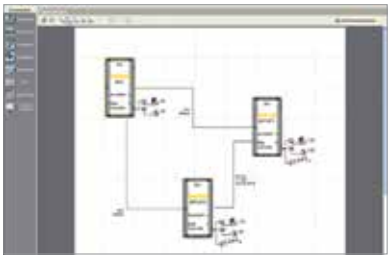
Sockets with LCS² quick-fixing crimp connector
Take AWG 22 single-core cables up to AWG 26 and AWG multicore cables
Contacts marked with dual colour code and wiring schemes T 568 A and T 568 B
Conform to standards ISO/IEC 11801 Ed. 2.0, amendment 2, EN 50173-1 and TIA/EIA 568C

| Pack | Cat.Nos | Arteor RJ 45 socket cat. $6_A$ |
|---|---|---|
| | | 360° metal shielding |
| | | **STP - 1 module** |
| 20 | 5 734 32 | ○ White |
| 10 | 5 728 06 | ● Magnesium |
| 10 | 5 723 52 | ○ White with green shutter |
| 10 | 5 728 52 | ● Magnesium with green shutter |
| 10 | 5 723 51 | ○ White with orange shutter |
| 10 | 5 728 51 | ● Magnesium with orange shutter |
| | | **STP with controlled access - 2 modules** Supplied with 2 keys for 5 sockets |
| 5 | 5 723 50 | ○ White with red shutter |
| 5 | 5 728 50 | ● Magnesium with red shutter |
| | | **UTP - 1 module** |
| 10 | 5 723 49 | ○ White |
| 10 | 5 728 49 | ● Magnesium |
| 10 | 5 723 59 | ○ White with green shutter |
| 10 | 5 728 59 | ● Magnesium with green shutter |
| 10 | 5 723 58 | ○ White with orange shutter |
| 10 | 5 728 58 | ● Magnesium with orange shutter |
| | | **UTP with controlled access - 2 modules** Supplied with 2 keys for 5 sockets |
| 5 | 5 723 57 | ○ White with red shutter |
| 5 | 5 728 57 | ● Magnesium with red shutter |

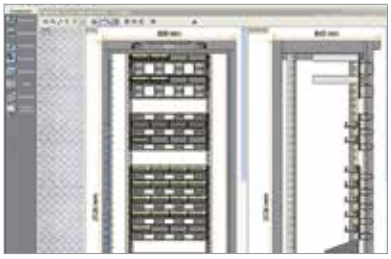
## NEW LCS PRO² SOFTWARE

# Your LCS² cabinet in a few clicks

Select your products and visualise your cabinet simply and quickly with the new LCS Pro2 software...
and complete your study with Chantier Chrono software which integrates trunking, columns, floor and feeder boxes



- LCS Pro² allows you **to automatically find** Cat.Nos by selecting characteristics and options



- LCS Pro² lets you **visualise the cabinet installation** and amend it if required

- LCS Pro² allows you to **easily manage your projects:** technical summaries, purchase orders, document printing

In addition to LCS Pro², Chantier Chrono extends the selection to trunking, columns, floor and feeder boxes

# Legrand cabling system LCS² category 6

**patch panels, connector units**

0 335 62

0 335 90

0 335 65

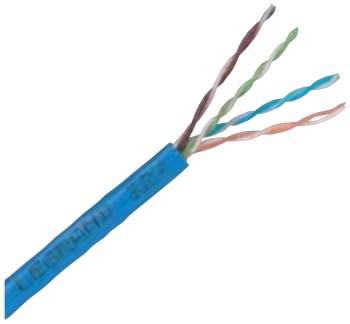
Cat. 6 connector
STP shielded

| Pack | Cat.Nos | Patch panels cat. 6<br>24 x RJ 45 quick-fixing connectors |
|---|---|---|
| | | Panels supplied with quick-fixing system<br>Universal mounting for all freestanding or wall-mounted cabinets<br>Panels ensure automatic earthing of each connector<br>Fitted with rear cable guide to hold cables during maintenance<br>Fitted with 4 units of 6 x LCS² RJ 45 cat. 6 quick-fixing crimp connectors, with colour code and wiring schemes T 568 A and T 568 B<br>Supplied with numbered colour labels<br>Conform to standards ISO/IEC 11801 Ed. 2.0, amendment 2, EN 50173-2 and TIA/EIA 568C<br>19" panel - 1 U |
| 1 | 0 335 61 | UTP panel - 8 contacts |
| 1 | 0 335 67 | UTP high density panel - 8 contacts |
| 1 | 0 335 62 | FTP panel - 9 contacts |
| 1 | 0 335 68 | FTP high density panel - 9 contacts |
| 1 | 0 335 63 | STP panel - metal shielding 360° |
| | | **UTP through panel**<br>24 x RJ 45 connectors |
| 1 | 0 335 89 | UTP through panel |

| Pack | Cat.Nos | Modular panels |
|---|---|---|
| | | Panels supplied with quick-fixing system<br>Universal mounting for all freestanding or wall-mounted cabinets<br>Panels ensure automatic earthing of each connector<br>Fitted with rear cable guide to hold cables during maintenance<br>Empty panels to be fitted with 4 units<br>Take the following equipment:<br>- 6 LCS² RJ 45 connector units<br>- telephone inlet units<br>- fibre optic units<br>- PoE injector units<br>- video streaming units<br>- switch units<br>- telephone/Ethernet doubler units<br>- copper/fibre optic converter units<br>- blanking plates |
| 1 | 0 335 90 | 19" panel - 1 U |
| | | **Units of 6 x RJ 45 connectors cat. 6**<br>Fitted with 6 x LCS² RJ 45 cat. 6 quick-fixing crimp connectors, with colour code and wiring schemes T 568 A and T 568 B<br>Supplied with colour labels<br>Conform to standards ISO/IEC 11801 Ed. 2.0, EN 50173-1 and TIA/EIA 568 |
| 2 | 0 335 64 | UTP unit - 8 contacts |
| 2 | 0 335 65 | FTP unit - 9 contacts |
| 2 | 0 335 66 | STP unit - metal shielding 360° |
| 10 | 0 335 91 | Blanking plate for 19" panel - Black |

# Legrand cabling system LCS² category 6

## cables



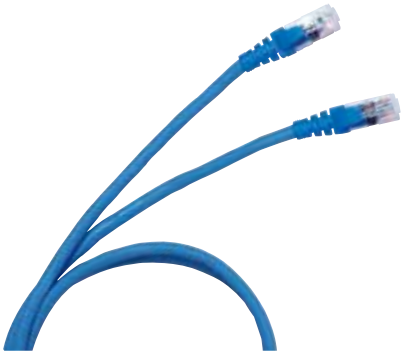
0 327 54

| Pack | Cat.Nos | Cables for cat. 6 LANs |
|---|---|---|
| | | Cables with 4 pairs or 2 x 4 twisted pairs 100 ohms<br>Colour code TIA/EIA<br>Conform to standards ISO/IEC 11801 Ed. 2.0, EN 50173-1 and TIA/EIA 568 C |
| | LSZH | **U/UTP - 4 pairs** |
| 305[1] | 0 327 54I | Length 305 m. Supplied in cardboard box<br>Weight 16 kg., Violet RAL 4005 |
| 500[1] | 0 328 61 | Length 500 m. Supplied on reel.<br>Weight 18 kg. Blue RAL 5015 |
| | PVC | |
| 305[1] | 0 327 55W | Length 305 m<br>Supplied in cardboard box, Weight 13 kg.,<br>White RAL 9003, MOQ 50 Box |
| 305[1] | 0 327 55 | Length 305 m<br>Supplied in cardboard box<br>Weight 13 kg. Blue RAL 5015 |
| 305[1] | 0 327 55O | Length 305 m<br>Supplied in cardboard box, Weight 13 kg.,<br>Orange RAL 2008, MOQ 50 Box |
| 305[1] | 0 327 55G | Length 305 m<br>Supplied in cardboard box, Weight 13 kg.,<br>Green RAL 6018/6024, MOQ 50 Box |
| | LSZH / PVC | **U/UTP - 2 x 4 pairs. Blue RAL 5015** |
| 500[1] | 0 328 63 | Length 500 m<br>Supplied in cardboard box, Weight 38 kg |
| | | **F/UTP - 4 pairs. Blue RAL 5015** |
| 305[1] | 0 328 56 | Length 305 m<br>Supplied on reel, Weight 17 kg |
| 500[1] | 0 327 56 | Length 500 m<br>Supplied on reel, Weight 25 kg |
| 305[1] | 0 328 57 | Length 305 m<br>Supplied in cardboard box, Weight 17 kg |
| | | **F/UTP - 2 x 4 pairs. Blue RAL 5015** |
| 50[1] | 0 327 76 | Length 500 m<br>Supplied on reel<br>Weight 48 kg |
| | | **SF/UTP - 4 pairs. Blue RAL 5015** |
| 500[1] | 0 327 57 | Length 500 m<br>Supplied on reel, eight 29 kg |
| 500[1] | 0 327 59 | Length 500 m<br>Supplied on reel, Weight 30 kg |
| | | **SF/UTP - 2 x 4 pairs. Blue RAL 5015** |
| 500[1] | 0 328 59 | Length 500 m<br>Supplied on reel, Weight 52 kg |

1: in metre(s)

# Legrand cabling system LCS² category 6

## cords



0 517 62

| Pack | Cat.Nos | RJ 45 cat. 6 patch cords and user cords |
|---|---|---|
| | | RJ 45 - RJ 45 right |
| | PVC | **U/UTP unscreened impedance 100 Ω** |
| 1 | 0 517 72 | Length 1 m |
| 1 | 0 517 73 | Length 2 m |
| 1 | 0 517 74 | Length 3 m |
| 1 | 0 517 75 | Length 5 m |
| | LSZH | |
| 1 | 0 518 62 / 0 518 58 | Length 1 m |
| 1 | 0 518 63 / 0 518 59 | Length 2 m |
| 1 | 0 518 64 / 0 518 60 | Length 3 m |
| 1 | 0 518 65 / 0 518 61 | Length 5 m |
| | PVC | **F/UTP screened impedance 100 Ω** |
| 1 | 0 517 62 | Length 1 m |
| 1 | 0 517 63 | Length 2 m |
| 1 | 0 517 64 | Length 3 m |
| 5 | 0 517 65 | Length 5 m |
| | LSZH | |
| 1 | 0 518 54 / 0 518 50 | Length 1 m |
| 1 | 0 518 55 / 0 518 51 | Length 2 m |
| 1 | 0 518 56 / 0 518 52 | Length 3 m |
| 1 | 0 518 57 / 0 518 53 | Length 5 m |
| | PVC | **SF/UTP shielded impedance 100 Ω** |
| 5 | 0 517 52 | Length 1 m |
| 5 | 0 517 53 | Length 2 m |
| 5 | 0 517 54 | Length 3 m |
| 5 | 0 517 55 | Length 5 m |

# Legrand cabling system LCS² category 6

## zone distribution boxes

0 335 46

0 335 40

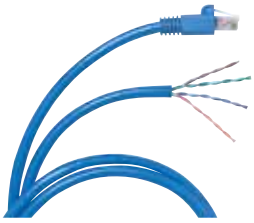
0 335 40 fitted with SC fibre optic unit, accessory Cat.No 0 335 20 and a 6 x RJ 45 connector unit

0 335 20 fibre optic accessory

| Pack | Cat.Nos | Zone distribution boxes |
|---|---|---|
| | | For ELV distribution in a zone fitted with 1 to 12 RJ 45 sockets<br>Centralise connections to guarantee flexibility and adaptability of the installation<br>Installed on false ceiling or false floor<br>Connect to the patch panel or the floor cabinet<br>Connection to an RJ 45 socket with stripped cord or to a Arteor RJ 45 socket with copper feedthrough with an RJ 45/RJ 45 cord<br>IP 21 - IK 07<br>Conform to standards UTE C 15-900, NF C 15-100, NF C 20-730, EN 50-174.2, CEI 60950, ISO/IEC 11801 Ed. 2.0, EN 50173-2 and TIA/EIA 568<br>Colour code TIA/EIA 568 A and C<br>Cords and cables: ISO 11801 Ed.2.0, EN 50173-1, TIA/EIA 568<br>Technical characteristics:<br>- polycarbonate PC hood<br>- polypropylene PP base<br>- RAL 7035<br>- hold connector units in place in the box: 100 N<br>- Cables anchored on support using Colring cable ties |
| | | **Zone distribution boxes cat. 6**<br>Fitted with 2 x 6 LCS² connector units<br>RJ 45 cat. 6 and RJ 45 blanking plates<br>Supplied with Colring cable ties |
| 1 | 0 335 44 | UTP |
| 1 | 0 335 45 | FTP |
| 1 | 0 335 46 | STP |
| | | **Self-assembly zone distribution box** |
| 1 | 0 335 40 | Used for mounting LCS² RJ 45 cat. 6 connector units (p. 83) |

# Legrand cabling system LCS² category 6

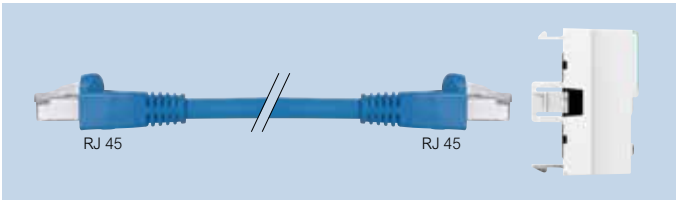
## cords and feedthrough sockets specifically for zone distribution boxes



0 517 57

0 515 13

5 723 31




Connection principle

| Pack | Cat.Nos | Cords cat. 6 - RJ 45/stripped AWG 24 |
|---|---|---|
| | | RJ 45 - straight stripped<br>Clip on and off in the zone distribution boxes and connection via LCS² connector of an RJ 45 socket by the stripped side<br>Cords prepared in factory, "ready for wiring"<br>Conform to standards ISO/IEC 11801 Ed. 2.0, EN 50173-1 and TIA/EIA 568<br>Blue RAL 5015<br>Wiring in T 568 B |
| | | **U/UTP unscreened impedance 100 Ω** |
| 4 | 0 517 57 | Length 8 m |
| 4 | 0 517 58 | Length 15 m |
| 4 | 0 517 59 | Length 20 m |
| | | **F/UTP screened impedance 100 Ω** |
| 4 | 0 517 96 | Length 8 m |
| 1 | 0 517 97 | Length 15 m |
| 4 | 0 517 98 | Length 20 m |

| Pack | Cat.Nos | Cords cat. 6 - RJ 45/RJ 45 |
|---|---|---|
| | | For direct connection via RJ 45 male plug to the zone distribution box and to the RJ 45 socket with copper feedthrough to ensure:<br>- safe connection<br>- speed and reliability of connection<br>Blue RAL 5015 |
| | | **U/UTP unscreened impedance 100 Ω** |
| 4 | 0 515 10 | Length 8 m |
| 4 | 0 515 11 | Length 15 m |
| 4 | 0 515 12 | Length 20 m |
| | | **F/UTP screened impedance 100 Ω** |
| 4 | 0 515 13 | Length 8 m |
| 4 | 0 515 14 | Length 15 m |
| 4 | 0 515 15 | Length 20 m |

| Pack | Cat.Nos | Sockets with copper feedthrough cat. 6 |
|---|---|---|
| | | Easy connection at the rear through simply attaching a male plug<br>Ensures network access for the RJ 45 socket<br>Used to create cat. 6 links<br>According to standards ISO 11801 Ed.2, EN 50173-1 and TIA/EIA 568 within the framework of operation with zone distribution boxes<br>Multidirectional cord entry<br>Installation possible in all supports with min. 40 mm depth<br>2 modules |
| | Arteor | **Cat. 6 UTP Arteor** |
| 10 | 5 723 31 | ○ White |
| 10 | 5 728 31 | ● Magnesium |
| | | **Cat. 6 FTP Arteor** |
| 10 | 5 723 33 | ○ White |
| 10 | 5 728 33 | ● Magnesium |

# Legrand cabling system LCS² category 6

## RJ 45 sockets


5 736 28


5 728 24


6 755 45


6 730 56


0 778 91


0 695 69


0 904 67

Sockets with LCS² quick-fixing crimp connector. Take AWG 22 single-core cables up to AWG 26 and AWG 24 multicore cables. Contacts marked with dual colour code and wiring schemes T 568 A and T 568 B. Conforming to standards ISO/IEC 11801 Ed. 2.0, EN 50173-1 and TIA/EIA 568

### Arteor RJ 45 socket cat. 6

| Pack | Cat.Nos | |
|---|---|---|
| | | **UTP - 1 module** |
| 20 | 5 734 28 | ○ White |
| 20 | 5 736 28 | ● Magnesium |
| 10 | 5 723 54 | ○ White with orange shutter |
| 10 | 5 728 54 | ● Magnesium with orange shutter |
| 10 | 5 723 55 | ○ White with green shutter |
| 10 | 5 728 55 | ● Magnesium with green shutter |
| | | **UTP - 2 modules** |
| 10 | 5 734 74 | ○ White |
| 10 | 5 736 74 | ● Magnesium |
| | | **UTP - 2 modules - round** |
| 10 | 5 723 24 | ○ White |
| 10 | 5 728 24 | ● Magnesium |
| | | **UTP with controlled access - 2 modules** |
| | | Supplied with 2 keys for 5 sockets |
| 5 | 5 723 53 | ○ White with red shutter |
| 5 | 5 728 53 | ● Magnesium with red shutter |
| | | **UTP retractable RJ 45 sockets - 4 modules** |
| | | With integrated retractable cord (0.9 m) |
| | | Winds up automatically with a pushbutton |
| 1 | 5 723 39 | ○ White |
| 1 | 5 728 39 | ● Magnesium |
| | | **FTP - 1 module** |
| 10 | 5 723 22 | ○ White |
| 10 | 5 728 22 | ● Magnesium |
| | | **FTP - 2 modules** |
| 10 | 5 734 76 | ○ White |
| 10 | 5 736 76 | ● Magnesium |
| | | **Shielded STP - 1 module** |
| 10 | 5 734 34 | ○ White |
| 10 | 5 736 34 | ● Magnesium |
| | | **Shielded STP - 2 modules** |
| 10 | 5 734 77 | ○ White |
| 10 | 5 736 77 | ● Magnesium |

### Mylinc RJ 45 socket cat. 6

| Pack | Cat.Nos | |
|---|---|---|
| | | **UTP - 1 module** |
| 20 | 6 755 45 | ○ White |

### Myrius RJ 45 sockets cat. 6

| Pack | Cat.Nos | |
|---|---|---|
| | | **UTP - 1 module** |
| 20 | 6 730 55 | ○ White |
| 20 | 6 731 55 | ● Black |
| | | **UTP - 2 modules** |
| 20 | 6 730 56 | ○ White |
| 20 | 6 731 56 | ● Black |

### Soliroc RJ 45 sockets cat. 6 - IK 10

| Pack | Cat.Nos | |
|---|---|---|
| 10 | 0 778 91 | IP 20<br>For at-risk areas or areas with no surveillance<br>FTP socket |

### Plexo RJ 45 sockets cat. 6 - IP 55 closed flap IK 07

| Pack | Cat.Nos | |
|---|---|---|
| | | Protection against water, dust. For industrial sites |
| 5/100 | 0 695 69 | FTP socket<br>◐ Grey/white |
| 1/20 | 0 695 61 | UTP socket<br>◐ Grey/white |
| 1 | 0 695 81 | Adaptor for RJ 45 socket<br>Weatherproofing ensured (IP 44) plug inserted<br>◐ Grey/white |

### Plexo 66 RJ 45 socket cat. 6 - IP 66 - IK 08

| Pack | Cat.Nos | |
|---|---|---|
| 1 | 0 904 67 | **FTP socket**<br>9 contacts<br>Weatherproofing ensured (IP 66) with plug inserted<br>Inclined 90°<br>● Grey RAL 7016/T029 |

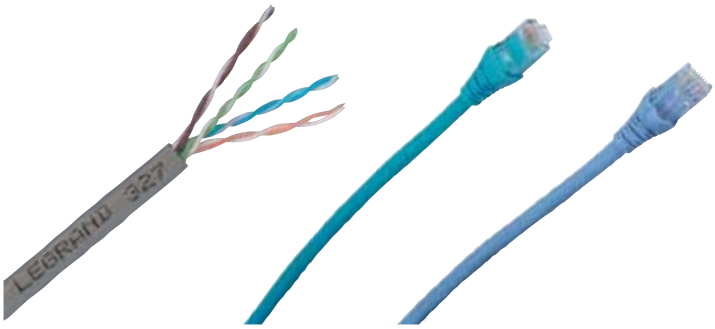
Arteor sockets with copper feedthrough
**p. 81, 85, 90**

Arteor audio/video sockets
**p. 120**

# Legrand standard solution category 6

6 327 91

0 765 88




6 327 24 6 327 60 6 327 50

| Pack | Cat.Nos | Patch panels cat. 6<br>24 x RJ 45 connectors, for unshielded keystone |
|---|---|---|
| 1 | 6 327 91 | Universal mounting for all freestanding or wall-mounted cabinets<br>Conform to standards ISO/IEC 11801 Ed. 2.0, EN 50173-2 and TIA/EIA 568<br>Modular Empty panel for 24 unshielded keystone jacks cat 6 and cat 5e supply with rear plastic cable support |
| | | **Keystone RJ 45 sockets cat. 6** |
| 10 | 0 765 88 | Cat 6 UTP socket with fast connection thanks to integrated crimping |
| | | **Surface mounting box** |
| 20 | 6 327 79 | 1 or 2 ports<br>For keystone connectors<br>Provides solution for integration of keystone in surface mounting installations |

| Pack | Cat.Nos | Cables for cat 6 LANs 24 AWG |
|---|---|---|
| | | Cables with 4 pairs twisted pairs 100 Ω<br>Color code TIA/EIA<br>Conform to standards ISO/IEC 11801 Ed. 2.0, EN 50173-1 and TIA/EIA 568C<br>**U/UTP - 4 Pairs** |
| 305 | 6 327 24 | Length 305 m<br>Supplied in cardboard box<br>Weight 16 kg. Dark grey RAL 7037 |
| 305 | 6 327 24W | Length 305 m<br>Supplied in cardboard box<br>Weight 16 kg.<br>White RAL 9003. MOQ - 50 box |
| 305 | 6 327 24O | Length 305 m<br>Supplied in cardboard box<br>Weight 16 kg.<br>Orange RAL 2008 MOQ 50 Box |
| 305 | 6 327 24G | Length 305 m<br>Supplied in cardboard box<br>Weight 16 kg.<br>Green RAL 6018 / 6024 MOQ 50 Box |
| | | **Patch cords** |
| | | RJ 45 - RJ 45<br>PVC |
| | | **U/UTP cat. 6 unscreened impedance 100 Ω**<br>Light blue |
| 20 | 6 327 50 | Length 1 m |
| 20 | 6 327 51 | Length 1.5 m |
| 20 | 6 327 52 | Length 2 m |
| 20 | 6 327 53 | Length 3 m |
| 20 | 6 327 54 | Length 5 m |
| | | **F/UTP cat. 6 screened impedance 100 Ω**<br>Blue-green |
| 20 | 6 327 60 | Length 1 m |
| 20 | 6 327 61 | Length 2 m |
| 20 | 6 327 62 | Length 3 m |
| 20 | 6 327 63 | Length 5 m |

# Legrand cabling system LCS² category 5e

**patch panels, connector units**

0 335 52

0 335 90

0 335 55

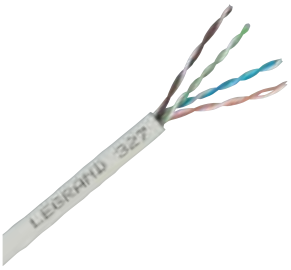
FTP cat. 5e connector

| Pack | Cat.Nos | **Patch panels cat. 5e 24 x RJ 45 connectors** |
|---|---|---|
| | | Panels supplied with quick-fixing system<br>Universal mounting for all freestanding or wall-mounted cabinets<br>Panels ensure automatic earthing of each connector<br>Fitted with rear cable guide to hold cables during maintenance<br>Fitted with 4 units of 6 x LCS² RJ 45 cat. 5e quick-fixing crimp connectors, with colour code and wiring schemes T 568 A and T 568 B<br>Supplied with colour labels numbered from 1 to 24<br>Conform to standards ISO/IEC 11801 Ed. 2.0, EN 50173-1 and TIA/EIA 568<br>19" panel - 1 U |
| | | **UTP panel** |
| 1 | 0 335 51 | UTP panel - 8 contacts |
| | | **FTP panel** |
| 1 | 0 335 52 | FTP panel - 9 contacts |
| | | **UTP through panel**<br>24 RJ 45 connectors |
| 1 | 0 335 88 | UTP through panel |

| Pack | Cat.Nos | **Modular panel** |
|---|---|---|
| | | Panel supplied with quick-fixing system<br>Universal mounting for all freestanding or wall-mounted cabinets<br>Panel ensure automatic grounding of each connector<br>Fitted with rear cable guide to hold cables during maintenance<br>Modular empty panels for up to 4 units<br>Take the following equipment:<br>- units of 6 x LCS² RJ 45 connectors<br>- telephone inlet units<br>- fibre optic units<br>- PoE injector units<br>- video streaming units<br>- switch units<br>- telephone/Ethernet doubler units<br>- copper/fibre optic converter units<br>- blanking plates |
| 1 | 0 335 90 | 19" panel - 1 U |
| | | **Units of 6 x RJ 45 connectors cat. 5e** |
| | | Fitted with units of 6 x LCS² RJ 45 cat. 5e connectors with quick-fixing crimp connectors, with colour code and wiring schemes T 568 A and T 568 B<br>Supplied with colour labels<br>Conforms to standards ISO/IEC 11801 Ed. 2.0, EN 50173-1 and TIA/EIA 568 |
| 2 | 0 335 54 | UTP unit |
| 2 | 0 335 55 | FTP unit |
| 10 | 0 335 91 | Blanking plate for 19" panel - Black |

# Legrand cabling system LCS² category 5e

## cables




0 328 50

| Pack | Cat.Nos | | Cables for cat. 5e LANs |
|---|---|---|---|
| | | | 4 twisted pair cables 100 ohms<br>LSZH sleeve: no halogen<br>Grey RAL 7035<br>Colour code TIA/EIA |
| | LSZH | PVC | **U/UTP - 4 pairs** |
| 305[1] | 0 327 50 | - | Length 305 m<br>Supplied in cardboard box<br>Weight 10 kg |
| 500[1] | 0 328 53 | - | Length 500 m<br>Supplied on reel<br>Weight 15 kg |
| 305[1] | - | 0 327 51 | Length 305 m<br>Supplied in cardboard box<br>Weight 9 kg |
| | | | **U/UTP - 2x4 pairs** |
| 500[1] | 0 328 55 | - | Length 500 m<br>Supplied on reel<br>Weight 34 kg |
| 500[1] | - | 0 327 73 | Length 500 m<br>Supplied on reel |
| | | | **F/UTP - 4 pairs** |
| 305[1] | 0 327 52 | - | Length 305 m<br>Supplied in cardboard box<br>Weight 12 kg |
| 500[1] | 0 328 50 | - | Length 500 m<br>Supplied on reel<br>Weight 21 kg |
| 305[1] | - | 0 327 53 | Length 305 m<br>Supplied by box<br>Weight 11 kg |
| | | | **F/UTP - 2x4 pairs** |
| 500[1] | 0 327 74 | - | Length 500 m<br>Supplied on reel<br>Weight 38 kg |

1: in metre(s)

# Legrand cabling system LCS² category 5e

## cords

0 516 40

| Pack | Cat.Nos | RJ 45 cat. 5e patch cords and user cords |
|---|---|---|
| | | RJ 45 - RJ 45 |
| | PVC | **U/UTP unscreened impedance 100 Ω** |
| | | Grey |
| 1 | 0 516 36 | Length 1m |
| 1 | 0 516 37 | Length 2m |
| 1 | 0 516 38 | Length 3m |
| 1 | 0 516 39 | Length 5m |
| | | **F/UTP screened impedance 100 Ω** |
| | | Grey |
| 1 | 0 516 40 | Length 1 m |
| 1 | 0 516 41 | Length 2 m |
| 1 | 0 516 42 | Length 3 m |
| 1 | 0 516 43 | Length 5 m |

# Legrand cabling system LCS² category 5e

## zone distribution boxes

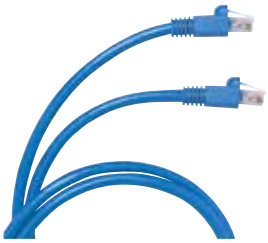
0 335 40

0 335 40 fitted with SC fibre optic unit, accessory Cat.No 335 20 and a 6 x RJ 45 connector unit

| Pack | Cat.Nos | Zone distribution boxes |
|---|---|---|
| | | For ELV distribution in a zone fitted with 1 to 12 RJ 45 sockets<br>Centralise connections to guarantee flexibility and adaptability of the installation<br>Installed on false ceiling or false floor<br>Connect to the patch panel or the floor cabinet<br>Connection to an RJ 45 socket with stripped cord or to a Arteor RJ 45 socket with copper feedthrough with an RJ 45/RJ 45 cord<br>IP 21 - IK 07<br>Conform to standards UTE C 15-900, NF C 15-100, NF C 20-730, EN 50-174.2, CEI 60950, ISO/IEC 11801 Ed. 2.0, EN 50173-2 and TIA/EIA 568<br>Colour code and wiring schemes T 568 A and T 568 B<br>Cords and cables: ISO 11801 Ed.2.0, EN 50173-1, TIA/EIA 568<br>Technical characteristics:<br>- polycarbonate PC hood<br>- polypropylene PP base<br>- RAL 7035<br>- hold connector units in place in the box: 100 N<br>- Cables anchored on support using Colring cable ties |
| | | **Self-assembly zone distribution box** |
| 1 | 0 335 40 | Used for mounting LCS² RJ 45 cat. 5e connector units (p. 83) |

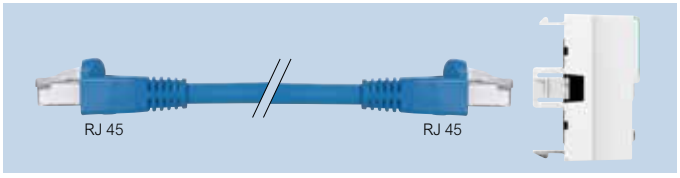
# Legrand cabling system LCS² category 5e

## cords specifically for zone distribution boxes feedthrough sockets



0 515 03

5 728 32




Connection principle

| Pack | Cat.Nos | Cat. 5e cords - RJ 45/stripped |
|---|---|---|
| | | RJ 45 - straight stripped. Clip on and off in the zone distribution boxes and RJ 45 socket connection via LCS² connector via the stripped side. Cords prepared in factory, "ready for wiring". Conform to standards ISO/IEC 11801 Ed. 2.0, EN 50173-1 and TIA/EIA 568. Grey RAL 7035<br>Wiring in T 568 B |
| | | **U/UTP unscreened impedance 100 Ω** |
| 4 | 0 517 90 | Length 8 m |
| 4 | 0 517 91 | Length 15 m |
| 4 | 0 517 92 | Length 20 m |
| | | **F/UTP screened impedance 100 Ω** |
| 4 | 0 517 93 | Length 8 m |
| 4 | 0 517 94 | Length 15 m |
| 4 | 0 517 95 | Length 20 m |

| Pack | Cat.Nos | Cat. 5e cords - RJ 45/RJ 45 |
|---|---|---|
| | | For direct connection via RJ 45 male plug to the zone distribution box and to the RJ 45 socket with copper feedthrough to ensure:<br>- safe connection<br>- speed and reliability of connection<br>Grey RAL 7035 |
| | | **U/UTP unscreened impedance 100 Ω** |
| 4 | 0 515 00 | Length 8 m |
| 4 | 0 515 01 | Length 15 m |
| 4 | 0 515 02 | Length 20 m |
| | | **F/UTP unscreened impedance 100 Ω** |
| 4 | 0 515 03 | Length 8 m |
| 4 | 0 515 04 | Length 15 m |
| 4 | 0 515 05 | Length 20 m |

| Pack | Cat.Nos | Sockets with copper feedthrough cat. 5e |
|---|---|---|
| | | Easy connection at the rear through simply attaching a male plug. Ensures network access for the RJ 45 socket. Used to create cat. 5e links. According to standards ISO 11801 Ed.2, EN 50173-1 and TIA/EIA 568 within the framework of operation with zone distribution boxes. Multidirectional cord entry. Installation possible in all supports with a min. 40 mm depth. 2 modules |
| | Arteor | **Cat. 5e UTP** |
| 10 | 5 723 30 |  ○ White |
| 10 | 5 728 30 | ● Magnesium |
| | Arteor | **Cat. 5e FTP** |
| 10 | 5 723 32 |  ○ White |
| 10 | 5 728 32 | ● Magnesium |

# Legrand cabling system LCS² category 5e

## RJ 45 sockets


6 731 54


5 734 29


0 695 57

Sockets with LCS² quick-fixing crimp connector
Take AWG 22 single-core cables up to AWG 26 and AWG 26 multicore cables
Contacts marked with dual colour code and wiring schemes T 568 A and T 568 B
Side cable entry for easy installation in all supports
Conforms to standards ISO/IEC 11801 Ed. 2.0, EN 50173-1 and TIA/EIA 568

| Pack | Cat.Nos | Myrius RJ 45 sockets cat. 5e |
|---|---|---|
| | | **UTP - 1 module** |
| 20 | 6 730 54 | ○ White |
| 20 | 6 731 54 | ● Black |
| | | **Mylinc RJ 45 sockets cat. 5e** |
| | | **UTP - 1 module** |
| 20 | 6 755 47 | ○ White |

| Pack | Cat.Nos | Arteor RJ 45 socket cat. 5e |
|---|---|---|
| | | **UTP - 1 module** |
| 20 | 5 734 29 | ○ White |
| 20 | 5 736 29 | ● Magnesium |
| | | **UTP - 2 modules** |
| 10 | 5 734 75 | ○ White |
| 20 | 5 736 75 | ● Magnesium |
| | | **FTP - 1 module** |
| 20 | 5 734 30 | ○ White |
| 20 | 5 736 30 | ● Magnesium |
| | | **Plexo RJ 45 sockets, cat. 5e - IP 55 closed flap IK 07** |
| | | Protection against water, dust |
| | | For industrial sites |
| 1/20 | 0 695 57 | FTP socket ◐ Grey/White |
| 1/20 | 0 695 56 | UTP socket ◐ Grey/White |
| 1 | 0 695 81 | Adaptor for RJ 45 socket Ensures weatherproofing (IP 44) with the plug inserted ◐ Grey/White |

Arteor sockets with copper feedthrough
**p. 81, 85, 90**

Arteor audio/video sockets
**p. 120**

# Legrand standard solution category 5e

6 327 91

0 765 87

6 327 30

6 327 40

| Pack | Cat.Nos | Patch panels cat. 5e<br>24 x RJ 45 connectors, for unshielded keystone |
|---|---|---|
| 1 | 6 327 91 | Universal mounting for all freestanding or wall-mounted cabinets<br>Conform to standards ISO/IEC 11801 Ed. 2.0, EN 50173-2 and TIA/EIA 568<br>Modular Empty panel for 24 unshielded keystone jacks cat 6 and cat 5e supply with rear plastic cable support |
| 10 | 0 765 87 | **Keystone RJ 45 sockets cat. 5e**<br>Cat 5e UTP socket with fast connection thanks to integrated crimping |
| 20 | 6 327 79 | **Surface mounting box**<br>1 or 2 ports<br>For keystone connectors<br>Provides solution for integration of keystone in surface mounting installations |

| Pack | Cat.Nos | Patch cords |
|---|---|---|
| | | RJ 45 - RJ 45<br>PVC |
| | | **U/UTP cat. 5e unscreened impedance 100 Ω**<br>Light pink |
| 20 | 6 327 30 | Length 1 m |
| 20 | 6 327 31 | Length 1.5 m |
| 20 | 6 327 32 | Length 2 m |
| 20 | 6 327 33 | Length 3 m |
| 20 | 6 327 34 | Length 5 m |
| | | **F/UTP cat. 5e screened impedance 100 Ω**<br>Light brown |
| 20 | 6 327 40 | Length 1 m |
| 20 | 6 327 41 | Length 2 m |
| 20 | 6 327 42 | Length 3 m |
| 20 | 6 327 43 | Length 5 m |

# Legrand cabling system LCS²

## LCS² system additional products cat. $6_A$, LCS² cat. 6, LCS² cat. 5e


0 335 39


0 335 34


0 335 12


0 335 16


0 334 75


0 335 02


0 332 93


0 335 01

| Pack | Cat.Nos | Modular panels |
|---|---|---|
| | | Panels supplied with captive screws and cage nuts or with quick fixing. Universal mounting for all freestanding or wall-mounted cabinets. Panels ensure automatic earthing of each connector. Fitted with rear cable guide to hold cables in place during maintenance |
| | | Modular empty panels for up to 4 units |
| | | Take the following equipment: |
| | | - units of 6 x LCS² RJ 45 connectors |
| | | - telephone inlet units |
| | | - fibre optic units |
| | | - PoE injector units |
| | | - video streaming units |
| | | - switch units |
| | | - telephone/Ethernet doubler units |
| | | - copper/fibre optic converter units |
| | | - blanking plates |
| 1 | 0 335 90 | 19" panel - 1 U |

| Pack | Cat.Nos | Doubler units |
|---|---|---|
| | | Units of 6 x LCS² RJ 45 doubler connectors for fast tool-free connection. Used with doubler sockets (p. 94) |
| 2 | 0 335 54 | UTP unit |
| 2 | 0 335 55 | FTP unit |
| 10 | 0 335 91 | Blanking plate for 19" panel - Black |
| | | **Ethernet/Ethernet doublers 100 base T** |
| 1 | 0 335 39 | FTP - 9 contacts |
| 1 | 0 335 38 | UTP - 8 contacts |
| | | **Telephone/Ethernet doublers 100 base T** |
| 1 | 0 335 37 | FTP - 9 contacts |
| 1 | 0 335 36 | UTP - 8 contacts |
| | | **Telephone/telephone doubler** |
| 1 | 0 335 35 | 45 contacts |

| Pack | Cat.Nos | Video streaming unit |
|---|---|---|
| 1 | 0 335 34 | Unit of 6 "F" connectors for video circuits |

| Pack | Cat.Nos | Fibre optic units |
|---|---|---|
| | | Clip directly onto fibre optic enclosure Cat.No 0 335 10 (p. 99), on the patch panels with fibre optic cassette Cat.No 0 335 11 (p. 99) or in the zone distribution boxes with fibre optic accessory Cat.No 0 335 20 (p. 103) |
| | | **Singlemode fibre units (9/125 µm)** |
| 1 | 0 335 13 | LC unit for 6 singlemode fibres |
| 1 | 0 335 12 | SC unit for 6 singlemode fibres |
| | | **Multimode fibre units (62.5 and 50/125 µm)** |
| 1 | 0 335 16 | ST unit for 6 multimode fibres |
| 1 | 0 335 17 | SC unit for 6 multimode fibres |
| 1 | 0 335 18 | LC unit for 6 multimode fibres |
| 1 | 0 335 19 | High-density LC unit for 12 multimode fibres |

| Pack | Cat.Nos | Blanking plates |
|---|---|---|
| | | **Set of 12 blanking plugs for RJ 45 LCS² connector** |
| 10 | 0 517 40 | White |
| 10 | 0 517 41 | Black |
| | | **Blanking plate for 19" panel** |
| 10 | 0 335 91 | Black |

| Pack | Cat.Nos | Controlled access units |
|---|---|---|
| | | Solution for making an RJ 45 passive connection on sensitive networks secure. A cord can be locked/unlocked using the unlocking tool. Suitable for all 19" patch panels in the LCS² Legrand cabling system range, cat. 5e, cat. 6 and cat. $6_A$ |
| | | Compatible with the cords in the LCS² Legrand cabling system range, cat. 5e, cat. 6 and cat. $6_A$ |
| | | **Controlled access units** |
| | | Unlocking tool not supplied |
| 2 | 0 334 71 | Black shutter |
| 2 | 0 334 72 | Blue shutter |
| 2 | 0 334 73 | Red shutter |
| 2 | 0 334 74 | Orange shutter |
| 2 | 0 334 75 | Green shutter |
| | | **Unlocking tool for controlled access units** |
| 5 | 0 334 70 | Unlocking tool |

| Pack | Cat.Nos | Ethernet switches 100 Mbps |
|---|---|---|
| | | Mounted in the patch panel |
| | | Conform with standards IEEE 802-3, EN 500 81-1 and EN 500 82-1 (Conformity with EMC requirements) |
| | | **Switch units for patch panel** |
| | | Clip directly onto the patch panels |
| 1 | 0 335 02 | 7 RJ 45 ports at the front, 1 of which is a cascade port |
| | | Power supply with transformer provided |
| 1 | 0 335 05 | 6 RJ 45 ports + 1 LC type optic port with front-mounted cascade 100 base FX type LC |
| | | Power supply via transformer provided |
| | | **Boxes to be installed on shelf** |
| 1 | 0 332 93 | 5 RJ 45 port switch |
| | | Power supply via transformer provided |
| | | Dimensions: 116 x 70 x 25 |
| 1 | 0 332 91 | 8 RJ 45 port switch |
| | | Power supply via transformer provided |
| | | Dimensions: 171 x 98 x 29 |

| Pack | Cat.Nos | Copper/fibre optic converter units |
|---|---|---|
| | | Simply and quickly permit copper to fibre conversion and vice versa |
| | | Clip directly onto the patch panels |
| | | Fitted with an SC type fibre optic connector |
| 1 | 0 335 06 | 10/100 base T to 10/100 base FX type SC |
| 1 | 0 335 07 | 1000 base T to 1000 base SX type SC |

| Pack | Cat.Nos | Midspan Power over Ethernet (PoE) injectors |
|---|---|---|
| 1 | 0 335 01 | 4 inlets/outlets |
| | | Used for supplying 4 Wi-Fi access points |
| | | Clips directly onto a patch panel |
| 1 | 0 327 37 | 1 inlet/outlet |
| | | Used for supplying a Wi-Fi access point |
| | | Direct connection to the patch panel |

# Legrand cabling system LCS²

**doubler sockets, adaptors and accessories**

0 539 49


0 533 00 in position
(no cord supplied)

0 533 01

0 327 60

0 517 09

| Pack | Cat.Nos | RJ 45 doubler sockets |
|---|---|---|
| | Arteor | **Telephone/Ethernet** |
| 10 | 5 723 36 | FTP - 9 contacts ○ White |
| 10 | 5 728 36 | FTP - 9 contacts ● Magnesium |
| 10 | 5 723 35 | UTP - 8 contacts ○ White |
| 10 | 5 728 35 | UTP - 8 contacts ● Magnesium |
| | | **Mobile doublers** |
| | | Clip into RJ 45 sockets to double applications |
| 10 | 0 327 83 | TV/computer network or telephone double connector |
| 10 | 0 327 47 | Telephone/telephone doubler |
| 10 | 0 327 45 | Computer network/telephone doubler |
| 10 | 0 327 46 | L1/L2 telephone doubler |
| 10 | 0 327 48 | Computer network/computer network double connector |
| | | **Weatherproof adaptors** |
| | | IP 55 - IK 07 |
| | | Allow all functions to be adapted |
| | Grey/White | 2 Arteor modules IP 55 operation |
| 10 | 0 695 80 | Adaptor with smoked flap |
| 1 | 0 695 79 | Adaptor with smoked flap lockable by special tool |
| 1 | 0 695 81 | Adaptor for RJ socket ensuring IP 44 waterproofness cable already connected |
| 1 | 0 919 45 | Locking tool (used for changing vandal-proof screws) |
| | | **Soliroc adaptor** |
| | | Used for adapting all functions |
| | | 2 Arteor modules |
| | | IK 10 - IP 55 |
| 1 | 0 778 80 | Adaptor with flap |
| 1 | 0 778 81 | Adaptor without flap |
| | | **Hypra adaptor** |
| 5 | 0 539 49 | IP 55 adaptor base |

| Pack | Cat.Nos | Cable protection accessories |
|---|---|---|
| | | Plastic material |
| | | IP 66/67 guaranteed connection with the pair Cat.No 0 533 02 |
| | | IP 55 with no connection for base with shutter |
| | | Protection for RJ 45 shielded or unshielded cables ensuring a link of category 5 |
| | | Conform to standards of the IEC 60603-7 series and to standard IEC 61076-3-106 (version 5) |
| | | Compatible with products on the market conforming to the standards listed |
| | | **Plug** |
| 3 | 0 533 00 | Integrated PE with sealing ring and clamping blades<br>Tool-free assembly<br>Ability to protect cables of category 5e |
| | | **Flush-mounting base** |
| 3 | 0 533 01 | Locking base<br>Supplied with RJ 45 female/female coupler cat. 5e |
| | | **Kit** |
| 3 | 0 533 02 | Flush-mounting base + plug |
| | | **Protective flap** |
| 3 | 0 533 03 | Fits on base Cat.No 0 533 01 |
| | | **RJ plugs for round cables** |
| | | Gold-coated contacts 1.2 µm |
| | | **RJ 11** |
| 50 | 0 517 01 | 4 contacts, width 9.65 mm |
| | | **RJ 12** |
| 50 | 0 517 02 | 6 contacts, width 9.65 mm |
| | | **RJ 45 cat. 5e** |
| 50 | 0 517 03 | 8 contacts, width 11.70 mm |
| 50 | 0 517 04 | 9 contacts, width 11.70 mm |
| | | **RJ 45 sleeves** |
| 50 | 0 517 06 | Black |
| 50 | 0 517 07 | White |
| | | **Stripping tool** |
| | | Slits the sheath and releases the conductors by rotation |
| | | For twisted pair cables |
| | | Does not damage the conductors |
| | | **Stripper** |
| 1 | 0 332 62 | For twisted pair and fibre optic cable |
| | | **Cutting pliers** |
| 1 | 0 327 60 | Cut wires cleanly without damaging the copper |
| | | **Crimping tool for RJ 45 plugs** |
| | | Used for crimping plugs RJ 4/6/8/9 contacts |
| | | Ratchet control of crimping mechanism |
| | | Able to cut and strip cables |
| 1 | 0 517 09 | Tool with 3 crimping points<br>High resistance steel material |
| | | **110 tool** |
| 1 | 0 332 60 | 110 tool |
| 1 | 0 332 61 | Replacement blade |

# Legrand cabling system LCS²

**telephone sockets, patches panels, cables and data sockets**


0 787 46


0 787 31


0 335 79

| Pack | Cat.Nos | Female USB DATA sockets - for data transfer |
|---|---|---|
| | | Used to bring connections closer to the user<br>For connecting USB devices (scanner-printer, external hard disk). Max. cable length: 5 m.<br>Recommended cable: USB A<br>1 module |
| | | **Preterminated** |
| | Arteor | USB 3.0. Equipped with a 15 cm cord |
| 1 | 5 720 94 | ○ White - square version |
| 1 | 5 725 94 | ● Magnesium - square version |
| | | **Connection via screw terminals** |
| | | USB 2.0. Cross section - 1 mm² |
| 1 | 5 722 75 | ○ White |
| 1 | 5 727 75 | ● Magnesium |
| | | **Female USB DATA amplifier - for data transfer** |
| | | Used to bring connections closer to the user in case of large distances<br>For connecting USB devices (digital school board / interactive whiteboard…) located more than 5 m away from a source (computer…)<br>The kit includes a transmitter (1 module) and a receiver (1 module)<br>The link between the transmitter and the receiver is made via a RJ 45 / RJ 45 cord |
| 1 | 5 720 23* | ○ White |
| | | **Telephone sockets** |
| | | **RJ 11 and RJ 12 sockets** |
| | | Equipped with a modular Jack connector with 1/4 turn terminal for fast connection Tap-off possible |
| | Arteor | |
| 10 | 5 723 00 | ○ White - RJ 11, 4 contacts 1 module |
| 10 | 5 728 00 | ● Magnesium - RJ 11, 4 contacts - 1 module |
| 10 | 5 723 13 | ○ White - RJ 11, 4 contacts - 2 modules |
| 10 | 5 728 13 | ● Magnesium - RJ 11, 4 contacts - 2 modules |
| 10 | 5 723 12 | ○ White - RJ 12, 6 contacts - 2 modules |
| 10 | 5 728 12 | ● Magnesium - RJ 12, 6 contacts - 2 modules |

* to be introduced shortly.

| Pack | Cat.Nos | Telephone sockets (continued) |
|---|---|---|
| | | **Single master - 2 modules** |
| | | With IDC connection<br>Conform to British Telecom |
| | Arteor | |
| 10 | 5 723 10 | ○ White |
| 10 | 5 728 10 | ● Magnesium |
| | | **Single secondary - 1 module** |
| | | With IDC connection<br>Conform to British Telecom |
| 5 | 5 723 01 | ○ White |
| 5 | 5 728 01 | ● Magnesium |
| | | **Patch panel telephone 50 ports 110 connect** |
| 1 | 0 335 79 | 19" panel - 1 U |
| | | **Cables for telephone networks cat. 3** |
| | | PVC sleeve<br>Colour white<br>Colour code TIA/EIA |
| | | **U/UTP - 50 pairs** |
| 1 | 0 328 91 | Length 500 m<br>Supplied on reel |
| | | **U/UTP - 100 pairs** |
| 1 | 0 328 88 | Length 500 m<br>Supplied on reel |
| | | **Panels and units for incoming telephone** |
| | | **Panels assembled - 1 U** |
| | | Fitted with 4 LCS² RJ 45 units of 12 ports with fast tool-free connection |
| 1 | 0 335 31 | 3-6/4-5 contacts for digital telephone |
| 1 | 0 335 30 | 4-5/7-8 contacts for analogue telephone |
| | | **Incoming telephone units for self-assembly panels** |
| | | Fitted with 12 LCS² RJ 45 ports with quick tool-free connection |
| 2 | 0 335 33 | 3-6/4-5 contacts for digital telephone |
| 2 | 0 335 32 | 4-5/7-8 contacts for analogue telephone |

# Legrand cabling system LCS² Wi-Fi

**switches, distributors and Wi-Fi access points**

5 720 84

5 723 76

5 723 77

Technical characteristics **p. 127**

| Pack | Cat.Nos | Flush-mounting 10/100 base T switches |
|---|---|---|
| | | For networking computer peripherals without a patch panel: computers, printers, servers, etc.<br>Possibility of extending an existing network by simply replacing an RJ 45 socket<br>Tool-free connection<br>Conform with standards IEEE 802.3 (Ethernet) and EN 500 81/82-2 (EMC requirements)<br>Installation in all supports with minimum 40 mm depth<br>6 ports at the front + 1 side RJ 45 connector for cabling and carrying out link tests<br>Port status display integrated into the RJ 45 connectors<br>Labelling of each port from 1 to 6 and marker holder for switch identification<br>6 modules |
| | Arteor | **Non-manageable** |
| 1 | 5 720 84 | PoE power supply (Power over Ethernet - standard 802.3 af)<br>○ White |
| 1 | 5 720 83 | 230 V∿ power supply<br>○ White |
| | | **Arteor VDI distribution block without connectors** |
| 1 | 0 332 80 | 16 modules<br>Dimensions: 135 x 223 x 57 mm<br>For small patch panel<br>For mounting a Arteor switch<br>Cat.Nos 5 720 84 / 83 |
| | | **Manageable Wi-Fi access points 802.11n** |
| | | Coverage area: 600 m². Dual band 2.4 GHz or 5 GHz<br>Conforms with standard 802.11 a, b, g, n<br>Theoretical speed: 300 Mbps gross<br>MIMO 2x2, supports up to 4 SSIDs<br>False ceiling integration - PoE power supply (Power over Ethernet - standard IEEE 802.3 af)<br>Network connection via a tool-free RJ 45 connector<br>The installation must include at least:<br>- a Wi-Fi access point (false ceiling)<br>- a PoE injector Cat.No 0 335 01 conforming with 802.3 af (LCS² unit format) to be installed in the patch cabinet<br>Can be configured centrally via controller Cat.No 0 332 25 or via configuration software Cat.No 0 335 24 or individually<br>The management function allows the network administrator to manage Wi-Fi access points remotely via a web https interface<br>Security via WEP, WPA and WPA2 (802.11i) encryption and 802.1x authentication QOS WMM compatible and supports SNMP management<br>Guest access:<br>independent access to the private Wi-Fi network<br>Energy saving with standby management |
| 1 | 0 335 22 | Wi-Fi surface-mounted access point 802.11n |
| 1 | 0 335 21 | Wi-Fi ceiling-mounted access point 802.11n |

| Pack | Cat.Nos | Manageable Wi-Fi access points 802.11a and b/g |
|---|---|---|
| | | Dual-band and dual-radio<br>Conform with standards 802.11a and 802.11b/g<br>Gross speed: 54 Mbps max. on each frequency (802.11a and 802.11g) simultaneously<br>Can be installed in addition to a new or existing LCS/LCS² structured cabling system to meet mobile working requirements<br>Can be integrated into all compatible supports with minimum 40 mm depth<br>Tool-free network connection via RJ 45 connector<br>PoE power supply (Power over Ethernet - standard 802.3 af)<br>The installation must include at least:<br>- Wi-Fi access point<br>- a PoE injector conforming with 802.3af (LCS² unit format) to be installed in the patch panel<br>The management function allows the network administrator to manage Wi-Fi access points remotely via a web interface<br>Security via WPA2 encryption (802.11i) and 802.1x authentication<br>Guest access: allows visitors free access to the Internet (access independent of the main Wi-Fi network). 4 modules |
| | Arteor | |
| 1 | 5 723 76 | With RJ 45 socket on front<br>○ White |
| 1 | 5 728 76 | With RJ 45 socket on front<br>● Magnesium |
| 1 | 5 723 77 | With no RJ 45 socket<br>○ White |
| 1 | 5 728 77 | With no RJ 45 socket<br>● Magnesium |
| | | **Wi-Fi network management system** |
| | | **Access point manager (disembedded)**<br>APs centralised configuration software |
| 1 | 0 335 24 | Access point manager |
| | | **Midspan Power over Ethernet (PoE) injectors** |
| 1 | 335 01 | 4 inlets/outlets<br>Used for supplying 4 Wi-Fi access points<br>Clip directly onto a patch panel |
| 1 | 327 37 | 1 inlet/outlet<br>Used for supplying a Wi-Fi access point<br>Direct connection to the patch panel |

RJ 45 Patch cords and user cords cat. 6
**p. 84, 87**

# Legrand cabling system LCS² fibre optic

## fibre optic cables

0 325 15

0 325 10

0 325 06

0 325 08

Fibre optic cables:
- fibre colour code: FOTAG
- standard: EN 50173-2, ISO IEC 11801

### OS1/OS2 singlemode fibre optic cables (9/125 µm)

For 9/125 µm singlemode installations (OS1)
Yellow jacket

| Pack | Cat.Nos | | |
|---|---|---|---|
| | Loose tube | 900 µm Tight buffer | |
| 2000[1] | 0 325 12 | - | Indoor/outdoor (universal) 6 fibres |
| 2000[1] | 0 325 13 | - | Outdoor, corrugated steel tape 6 fibres |
| 2000[1] | 0 325 14 | 0 325 50 | Indoor/outdoor (universal) 12 fibres |
| 2000[1] | 0 325 15 | - | Outdoor, corrugated steel tape 12 fibres |
| 2000[1] | 0 325 51 | - | Indoor/outdoor (universal) 24 fibres |

### OM2 multimode fibre optic cables (50/125 µm)

For 50/125 µm multimode installations (OM2)
Orange jacket

| Pack | Cat.Nos | | |
|---|---|---|---|
| | Loose tube | 900 µm Tight buffer | |
| 2000[1] | - | 0 325 55 | Indoor/outdoor (universal) 4 fibres |
| 2000[1] | 0 325 04 | 0 325 08 | Indoor/outdoor (universal) 6 fibres |
| 2000[1] | 0 325 05 | - | Outdoor, corrugated steel tape 6 fibres |
| 2000[1] | 0 325 06 | 0 325 09 | Indoor/outdoor (universal) 12 fibres |
| 2000[1] | 0 325 07 | - | Outdoor, corrugated steel tape 12 fibres |

### OM3 multimode fibre optic cables (50/125 µm)

For 50/125 µm multimode installations (OM3)
Green jacket
10 Gigabit Ethernet compliant

| Pack | Cat.Nos | | |
|---|---|---|---|
| | Loose tube | 900 µm Tight buffer | |
| 2000[1] | - | 0 325 10 | Indoor/outdoor (universal) 6 fibres |
| 2000[1] | - | 0 325 11 | Indoor/outdoor (universal) 12 fibres |
| 2000[1] | 0 325 53 | 0 325 52 | Indoor/outdoor (universal) 24 fibres |

### OM4 multimode fibre optic cables (50/125 µm)

For 50/125 µm multimode installations (OM4)
Blue sheaths
10 Gigabit Ethernet compliant

| Pack | Cat.Nos | |
|---|---|---|
| | Tight buffer 900 µm | |
| 500 | 0 326 65 | Indoor/outdoor (glass strands) 6 fibres - 500 m |
| 1000 | 0 326 66 | Indoor/outdoor (glass strands) 6 fibres - 1000 m |
| 1000 | 0 326 67 | Indoor/outdoor (glass strands) 12 fibres - 1000 m |
| 1000 | 0 326 68 | Indoor/outdoor (glass strands) 24 fibres - 1000 m |

1: in metre(s)

# Legrand cabling system LCS² fibre optic

## optic connectors and pigtails

0 326 90

0 326 57 — 0 326 58 — 0 326 53



0 331 27 — 0 331 00

0 330 49

Installation and performance principles **p. 128**

| Pack | Cat.Nos | Tool case for preparing fibre optic for fibre optic connectors |
|---|---|---|
| 1 | 0 326 90 | Provides the tools required for preparing fibre optic cables, for carrying out initial tests of the connection of fibres to connectors and the accessories for easy connection in all situations<br>Comprises:<br>- installation instructions and video<br>- stripping tool (for fibres and cables)<br>- cleaving tool<br>- microscope for checking the quality of the cut<br>- visual fault locator with cord<br>- accessories (ultra-strong scissors, marker, protective glasses, etc.) |
| | | **Update kit for case Cat.No 0 331 93** |
| 1 | 0 326 91 | Comprises:<br>- visual fault locator with cord<br>- adaptors for connectors<br>- connector support for easier connection<br>- fibre positioning label to be affixed to the cleaver in case Cat.No 0 331 93 |
| | | **Fast-connection connectors** |
| | | Quick to connect, reliable and can be reused up to 5 times<br>Microswitch for locking the fibre inside the connector and illuminated indicator for checking for faults at the end of the process<br>These connectors do not require any glue, polishing or special tools<br>For installation on tight jacketed fibre (Ø 900 µm)<br>For loose jacketed fibre (Ø 250 µm), use a spreader Cat.Nos 0 330 48 or 0 330 49 |
| | | **Multimode connectors** |
| 10 | 0 326 57 | SC/UPC connector 50 µm OM3/OM4 900 µm |
| 10 | 0 326 58 | LC/UPC connector 50 µm OM3/OM4 900 µm |
| 10 | 0 326 56 | ST/UPC connector 50 µm OM3/OM4 900 µm |
| 10 | 0 326 62 | SC connector 62.5 µm OM1 900 µm |
| 10 | 0 326 61 | ST connector 62.5 µm OM1 900 µm |
| | | **Singlemode connectors** |
| 10 | 0 326 52 | SC/UPC connector 9 µm OS1/OS2 900 µm |
| 10 | 0 326 53 | LC/UPC connector 9 µm OS1/OS2 900 µm |
| 10 | 0 326 54 | SC/APC connector 9 µm OS1/OS2 900 µm |

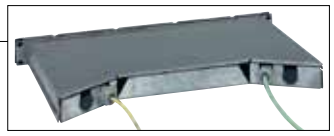
| Pack | Cat.Nos | Pigtails |
|---|---|---|
| | | Supplied with 900 µm sleeve, 1 m |
| | | **10 Gb - 50/125 µm - OM4** |
| 10 | 0 326 70 | LC connectors |
| 1 | 0 326 71 | Kit of 12 pigtails LC connectors |
| | | **10 Gb - 50/125 µm - OM3** |
| 1 | 0 326 22 | SC connector |
| 1 | 0 326 23 | LC connector |
| 1 | 0 326 27 | 6 x LC-PC connectors |
| 1 | 0 326 26 | 12 x LC-PC connectors |
| | | **9/125 µm - OS1/OS2** |
| 1 | 0 326 19 | SC/APC connector |
| 1 | 0 326 20 | SC connector |
| 1 | 0 326 21 | LC connector |
| 1 | 0 326 24 | 12 x LC-UPC connectors |
| 1 | 0 326 25 | 6 x LC-UPC connectors |
| | | **Thermoretractable sleeve for pigtails** |
| 1 | 0 327 44 | 40 mm - pack of 50 sleeves |
| | | **Glue-on connectors 50/125 and 62.5/125 µm** |
| | | Supplied with sleeve 900 µm<br>Connectors with ceramic ferrule<br>Typical attenuation: 0.3 dB |
| 10 | 0 331 27 | ST connector |
| 10 | 0 331 47 | SC connector |
| 10 | 0 331 00 | LC connector |
| | | **Breakout kits** |
| | | For 900 µm of fibre optic<br>Take 250 µm fibre diameters |
| 1 | 0 330 48 | 6 fibre breakout kit |
| 1 | 0 330 49 | 12 fibre breakout kit |

# Legrand cabling system LCS² fibre optic

## 19" fibre optic drawers

0 462 91

0 335 10 fitted with fibre optic units



"Tail-coat" rear
for easier cable entry

0 335 13

0 335 12

0 335 16

0 335 11 fitted with fibre
optic unit 335 17

| Pack | Cat.Nos | Floor distribution fibre optic cabinets |
|---|---|---|
| | | Reversible metal cabinets with key lock<br>IP20 - IK 08<br>Maximum capacity:<br>- 24 fibres with ST connectors<br>- 48 fibres with SC connectors<br>- 96 fibres with LC connectors<br>Up to 4 fibre optic units can be fitted<br>Cat.Nos 0 325 70/71/72/73/74/75/76/77/78/79,<br>0 335 12/13/16/17/18/19 and 0 327 86<br>4 cable entries (2 at the top and 2 at the bottom)<br>12 cable outlets, 22 mm diameter (3 at the top, 3 at the bottom and 6 at the sides)<br>Supplied with 1 black ISO 20 cable gland to hold the incoming cable and 15 feedthrough covers<br>Supplied with fibre optic accessories for the fibre coiling<br>The outgoing cables can be clamped using a clamp at the back of the cabinet<br>Can take 2 cassettes for pigtails Cat.No 0 329 07 (incoming and outgoing)<br>292 x 323 x 92 mm<br>Black RAL 9005 |
| 1 | 0 462 90 | Modular cabinet |
| 1 | 0 462 91 | Cabinet equipped with 2 SC fibre optic units for 12 multimode fibres |
| | | **19" slide-in modular fibre optic drawers** |
| | | Limit switch stop with 45° slope<br>Depth 220 mm, height 1 U |
| 1 | 0 335 10 | Maximum capacity:<br>- 24 x ST and SC connectors ST<br>- 48 x LC connectors<br>Supplied with screws and wiring accessories<br>Takes up to 4 fibre optic units (see below) |
| 1 | 0 335 09 | Supplied with 24 SC connectors |
| | | **Fibre optic drawers (fully loaded)** |
| | | Fixing: 19" standard with fastening kit of 4 cage nuts washers and screws.<br>4 incoming cable areas at the bottom.<br>1 cable seal for cable from 6 to 12 mm. |
| 1 | 0 325 20 | 12 SC Duplex |
| 1 | 0 325 22 | 24 LC Duplex |

| Pack | Cat.Nos | Fibre optic units |
|---|---|---|
| | | Clip directly onto the fibre optic drawer Cat.No 0 335 10 or on the patch panels with fibre optic cassette Cat.No 0 335 11 |
| | | **Singlemode fibre units (9/125 µm)** |
| 1 | 0 335 13 | LC unit for 6 singlemode fibres |
| 1 | 0 335 12 | SC unit for 6 singlemode fibres |
| | | **Multimode fibre units (62.5 and 50/125 µm)** |
| 1 | 0 335 16 | ST unit for 6 multimode fibres |
| 1 | 0 335 17 | SC unit for 6 multimode fibres |
| 1 | 0 335 18 | LC unit for 6 multimode fibres |
| 1 | 0 335 19 | High-density LC unit for 12 multimode fibres |
| | | **Switch/fibre optic unit** |
| 1 | 0 335 05 | Clips directly onto the patch panels<br>6 x RJ 45 ports + 1 cascade LC type optic port at the front<br>Power supply via transformer provided |
| | | **Copper/fibre optic converter units** |
| | | For simply and fast copper to fibre conversion and vice versa<br>Clip directly onto the patch panels<br>Fitted with an SC type fibre optic connector |
| 1 | 0 335 06 | 10/100 base T to 10/100 base FX type SC |
| 1 | 0 335 07 | 1000 base T to 1000 base SX type SC |
| | | **Fibre optic cassette for patch panel** |
| 1 | 0 335 11 | Ensures fibre coiling (from 2 to 12 fibres)<br>Takes a fibre optic unit<br>Cat.Nos 0 335 12/13/16/17/18/19<br>Used for linking copper and fibre optic units on the same LCS² patch panel |
| | | **Blanking plate for 19" panel** |
| 10 | 0 335 91 | Black |
| | | **Cassette for pigtails** |
| 1 | 0 329 07 | 12-fibre capacity |
| 1 | 0 326 72 | 24-fibre capacity |

# Legrand cabling system LCS² fibre optic

## 19" high density fibre optic drawer

0 325 69 (not equipped)

| Pack | Cat.Nos | 19" high density fibre optic drawer |
|---|---|---|
| 1 | 0 325 69 | Modular fibre optic drawer<br>Slide-in and modular drawer<br>Maximum capacity:<br>- 36 ST and SC connectors<br>- 72 LC connectors<br>Depth 220 mm, height 1 U<br>Supplied with screws and wiring accessories<br>Receives up to 3 fibre optic units below |
| | | **Fibre optic units** |
| | | Clip directly onto the optic drawer<br>Cat.No 0 325 69 |
| | | **Singlemode fibre units (9/125 µm)** |
| 1 | 0 325 73 | LC duplex unit for 12 singlemode fibres - blue |
| 1 | 0 325 74 | LC quadriplex unit for 24 singlemode fibres - blue |
| 1 | 0 325 70 | ST duplex unit for 12 singlemode fibres - blue |
| 1 | 0 325 71 | SC duplex unit for 12 singlemode fibres - blue |
| 1 | 0 325 72 | MPO unit type A for 6 x 12 singlemode fibres - blue |
| | | **Multimode fibre units (62.5 and 50/125 µm)** |
| 1 | 0 325 78 | LC duplex unit for 12 multimode fibres - beige |
| 1 | 0 325 79 | LC quadriplex unit for 24 multimode fibres - beige |
| 1 | 0 325 75 | ST duplex unit for 12 multimode fibres - beige |
| 1 | 0 325 76 | SC duplex unit for 12 multimode fibres - beige |
| 1 | 0 325 77 | MPO unit type A for 6 x 12 multimode fibres - beige |
| | | **Accessory** |
| 1 | 0 335 93 | Blanking plate |
| | | **Accessories common to 2 fibre optic drawers** |
| | | **Cassettes for pigtails** |
| 1 | 0 329 07 | 12 fibre capacity |
| 1 | 0 326 72 | 24-fibre capacity |
| | | **Bend limiting clip** |
| 8 | 0 335 94 | Fibre management bend limiting clip |

# Legrand cabling system LCS² fibre optic

## OM4 cables and cords

### MTP connectors

**Specifications**

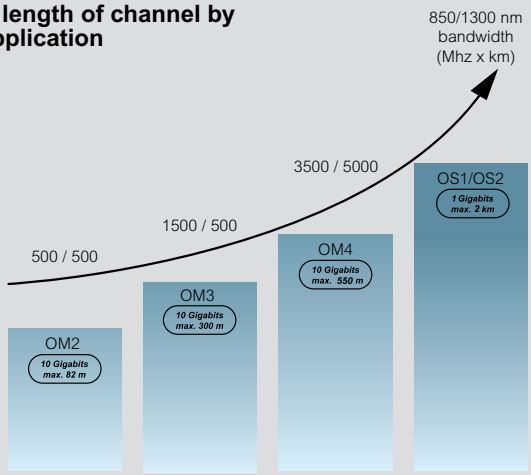
| | Multimode Elite® | Singlemode Elite® |
|---|---|---|
| **Insertion loss** | 0.1 dB Typical (all fibres)<br>0.35 dB Maximum (single fibre)(2)(3) | 0.1 dB Typical (all fibres)<br>0.35 dB Maximum (single fibre)(1)(4) |
| **Optical return Loss** | N/A | > 60 dB (8° Angle Polish) |

1: As tested per ANSI/EIA-455-171 Method D3
2: As tested per ANSI/EIA-455-171 Method D1
3: As tested with proposed encircled flux launch condition on 50 µm fiber and 850nm per IEC 61280-4-1
4: Compliant with proposed IEC 61755-3-31/GRADE B

### Cassette connectors

| Optical performance | Singlemode | Multimode |
|---|---|---|
| **IL MAX/Master (acceptance)** | 0.15 dB | 0.15 dB |
| **IL MAX/Random** | 0.30 dB | 0.25 dB |
| **Ave/Master** | 0.12 dB | 0.08 dB |
| **Ave/Random** | 0.12 dB | 0.10 dB |
| **Return Loss** | 55/65 dB | - |

### Maximum length of channel by fibre optic application




| Applications | Multimode | | | Singlemode |
|---|---|---|---|---|
| | OM2 | OM3 | OM4 | OS1/OS2 |
| **10 Gigabits Ethernet (S/R base)** | 82 m | 300 m | 550 m(1) | NA |
| **Giga Ethernet (LX base)** | 550 m | 550 m | 550 m | 2 km |
| **Giga Ethernet (SX base)** | 550 m | 550 m | 1100 m | NA |

TIA 568
Applications IEEE 802.3

1: Engineered solution using a max. cabled fibre attenuation of 3.0 dB/km. If not distance is of 400 m

# Legrand cabling system LCS² fibre optic

**MTP solutions**

0 326 40

0 326 42

0 326 45

0 326 46

| Pack | Cat.Nos | High density, modular fibre optic drawer |
|---|---|---|
| | | **Fibre optic drawers with cord management at the front and rear**<br>Modular fibre optic drawer<br>Fixed modular frame to take the cassettes below<br>Maximum capacity 2 U (takes up to 12 cassettes)<br>- 288 LC connectors<br>- 144 SC connectors<br>Maximum capacity 1 U (takes up to 5 cassettes)<br>- 120 LC connectors<br>- 60 SC connectors<br>Depth: 500 mm |
| 1 | 0 326 40 | 1 U |
| 1 | 0 326 42 | 2 U |
| | | **Fibre optic drawers without cord management**<br>Modular fibre optic drawer<br>Fixed modular frame to take the cassettes below<br>Maximum capacity 1 U (takes up to 5 cassettes)<br>- 120 LC connectors<br>- 60 SC connectors<br>Depth: 340 mm |
| 1 | 0 326 41 | 1 U |
| | | **High Density cassettes**(1)<br>Clip directly into fibre optic drawers<br>Cat.No 0 326 40/41/42<br>Cassettes slide into the above frame<br>Remove cassettes from the front using the metal tab provided<br>MTP Elite® high performance cassettes<br>Low insertion loss < 0.35 dB<br>A/C polarity |
| | | **OM4 multimode cassettes (50/125 µm)**<br>For 10 Gigabit Ethernet network<br>For 50/125 µm multimode installations, OM4 type |
| 1 | 0 326 45 | MTP Elite® cassette (MPO compatible) 24 x LC fibres OM4 Type A/C |
| 1 | 0 326 46 | MTP Elite® cassette (MPO compatible) 12 x SC fibres OM4 Type A/C |
| | | **OS1/OS2 cassettes (9/125 µm)**<br>For 9/125 µm singlemode installations, OS1/OS2 type |
| 1 | 0 326 47 | MTP Elite® cassette (MPO compatible) 24 x LC fibres OS1/OS2 Type A/C |
| 1 | 0 326 48 | MTP Elite® cassette (MPO compatible) 12 x SC fibres OS1/OS2 Type A/C |
| | | **Cover** |
| 1 | 0 326 49 | Blanking cassette |

1: MTP Elite® is a registered trademark of the US Conec Ltd

LCS²
EQUIPMENT

# A/C polarity for high density cassettes

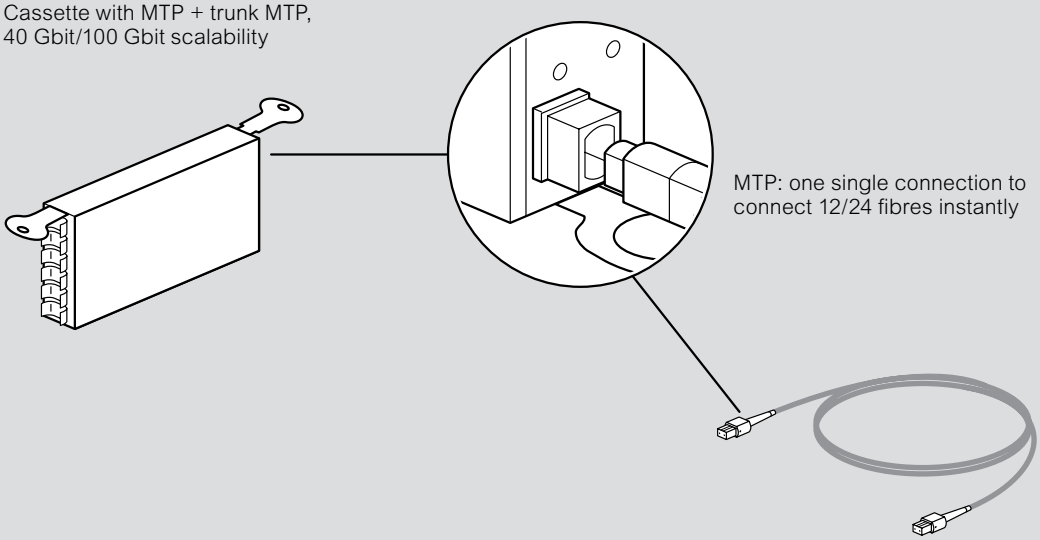
The polarity of Legrand cassettes is compatible with methods A and C defined in standard ANSI/TIA - C.O. - Annex B

## ADVANTAGES

- The cassettes are identical at each end of the link
- Can be used with singlemode and multimode
- 1 single type of patch cord for each end of the link (method C polarity)

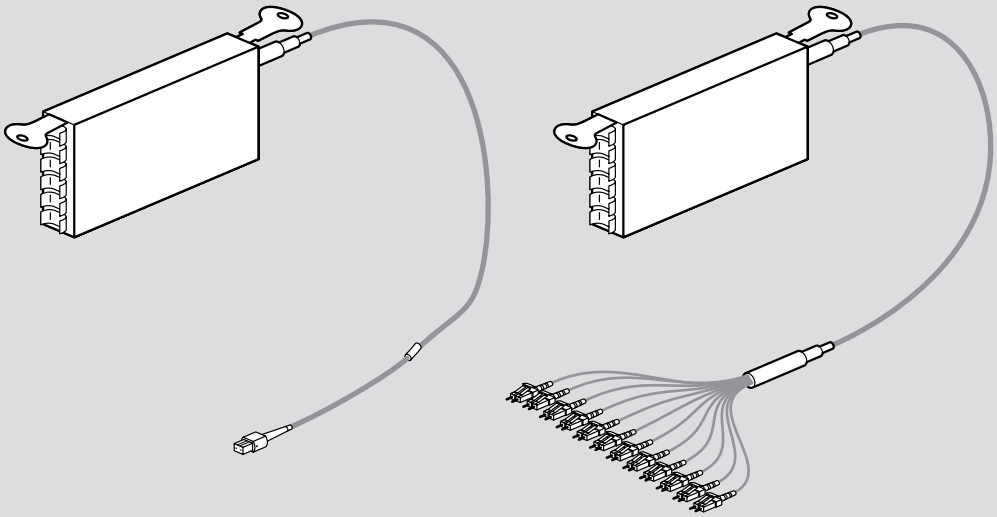
## Cassette with MTP solution

Cassette with MTP + trunk MTP,
40 Gbit/100 Gbit scalability



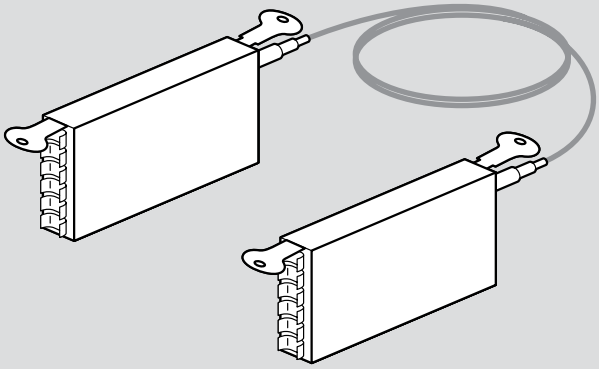

## Cassette without MTP solution

Cassette without MTP at the back + Terminated MTP or Fan out



## 2 cassettes without MTP solution

2 cassettes without MTP at the back terminated together



# Legrand cabling system LCS² fibre optic

## fibre sockets


0 786 16


0 786 17


0 786 18

| Pack | Cat.Nos | Fibre optic sockets |
|---|---|---|
| | | Fitted with duplex feedthrough 2 inlets 2 outlets<br>Used for connecting 2 fibres (fitted with their connector)<br>Supplied with protective caps<br>Fitted with transparent marker holder<br>2 modules |
| 1 | 0 786 16 | **Socket with fibre optic feedthrough 2 x ST**<br>Bayonet connection (STII compatible)<br>○ White |
| 1 | 0 786 17 | **Socket with fibre optic feedthrough 2 x SC**<br>Push-pull connection<br>○ White |
| 1 | 0 786 18 | **Socket with fibre optic feedthrough 2 x LC**<br>Push-pull connection<br>○ White |

| Pack | Cat.Nos | Socket with fibre optic feedthrough |
|---|---|---|
| 1 | 0 786 14 | **Socket with fibre optic feedthrough 2 x SC/APC**<br>Push-pull connection<br>With shutters<br>○ White |

# Legrand cabling system LCS² fibre optic

## zone distribution boxes


0 335 40


0 335 20 fibre optic accessory

| Pack | Cat.Nos | Zone distribution boxe |
|---|---|---|
| | | For ELV distribution in a zone fitted with<br>1 to 12 RJ 45 sockets<br>Centralise connections to guarantee flexibility and adaptability of the installation<br>Installed on false ceiling or false floor<br>Connect to the patch panel or the floor cabinet<br>Conform to standards UTE C 15-900, NF C 15-100, NF C 20-730, EN 50-174.2, CEI 60950, ISO/IEC 11801 Ed. 2.0, EN 50173-2 and TIA/EIA 568<br>Colour code and wiring schemes T 568 A and T 568 B<br>Cords and cables: ISO 11801 Ed.2.0, EN 50173-1, TIA/EIA 568<br>Technical characteristics:<br>- polycarbonate PC hood<br>- polypropylene PP base<br>- RAL 7035<br>- hold connector units in place in the box: 100 N<br>- Cables anchored on support using Colring cable ties |
| 1 | 0 335 40 | **Self-assembly zone distribution box**<br>Used for fitting fibre optic accessory units |

| Pack | Cat.Nos | Fibre optic accessory |
|---|---|---|
| 1 | 0 335 20 | Used for fitting fibre optic units and the fibre coil in the zone distribution box |

| Pack | Cat.Nos | Sockets with fibre optic feedthrough |
|---|---|---|
| | | Fitted with duplex feedthrough 2 inlets/2 outlets<br>Used for connecting 2 fibres (fitted with their connector)<br>Supplied with protective caps<br>Fitted with transparent marker holder<br>2 modules |
| 1 | 0 786 16 | **Socket with fibre optic feedthrough 2 x ST**<br>Bayonet connection (STII compatible)<br>○ White |
| 1 | 0 786 17 | **Socket with fibre optic feedthrough 2 x SC**<br>Push-pull connection<br>○ White |
| 1 | 0 786 18 | **Socket with fibre optic feedthrough 2 x LC**<br>Push-pull connection<br>○ White |

# Legrand cabling system LCS² fibre optic

**FTTO (Fiber To The Office) - Full IP**

0 779 05

0 326 80

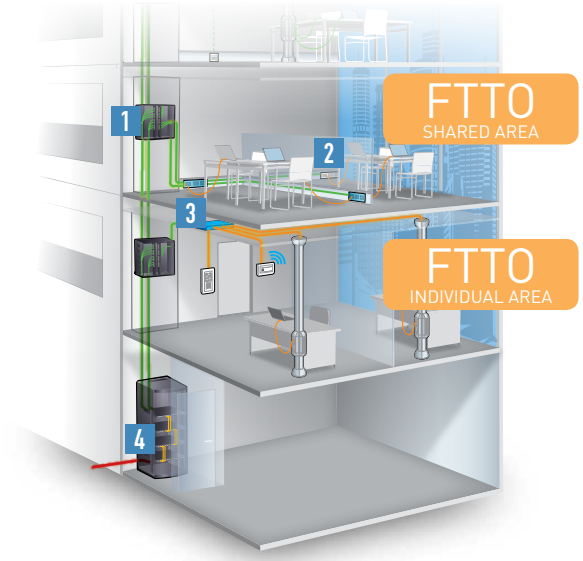
Conforming to IEEE 802.3 (Ethernet), POE 802.3af, PoE+ 802.3at, 802.1x (authentication via port), and 802.1q VLAN trunking standards
Compatible with SNMP, IPv6, QoS level 2 (802.1p) and level 3 (DiffServ), VLAN, Rapid Spanning Tree, and IGMPv3 snooping

| Pack | Cat.Nos | Shared working areas |
|---|---|---|
| 1 | 0 779 05 | **Fibre optic/copper switch**<br>For converting and distributing the optical signal to four 10/100/1000 RJ 45 ports with auto-MDI/X and PoE/PoE+ auto-negotiation on the front<br>One 10/100/1000 RJ 45 port with auto-MDI/X and auto-negotiation on the side for network extension<br>Fully manageable, without fan<br>One SFP 1000 base SX fibre optic port included, LC connector<br>Labelling of each port with label-holder<br>For integration in all 4-module supports, depth 50 mm minimum<br>Supplied with its own power supply Cat.Nos 0 779 06, max. power 60 W. 4 modules - White |
| 1 | 0 779 06 | **Power supply for fibre optic/copper switch**<br>Power supply for fibre optic/copper switch Cat.Nos 0 779 05<br>For installation in trunking only |
| | | **Individual working areas** |
| 1 | 0 326 80 | **Active zone box**<br>For converting and distributing the optical signal to five 10/100/1000 RJ 45 ports<br>For powering IP devices via the four RJ 45 ports via PoE or PoE+<br>One SFP 1000 base SX fibre optic port included, LC connector<br>Labelling of each port with label-holder<br>For installation in false ceilings or raised access floors using supports Cat.Nos 0 326 81/82<br>Power supply 230 V~ |
| | | **Supports**<br>Integral fibre optic coiling cassette with quadriplex LC feedthrough |
| 1 | 0 326 81 | For installing the active zone box Cat.Nos 0 326 80 in a false ceiling<br>Access to the zone box via a pivoting flap<br>Support for spare cords |
| 1 | 0 326 82 | For installing the active zone box Cat.Nos 0 326 80 in a raised access floor |
| | | **Auxiliary contact** |
| 1 | 0 326 83 | For active zone box Cat.Nos 0 326 80<br>For feeding back volt-free data to the IP network<br>For integration directly in the active zone box (automatic connection) |
| | | **Battery** |
| 1 | 0 326 84 | For active zone box Cat.Nos 0 326 80<br>Provides continuity of operation of the active zone box in the event of a power cut. 52 V - 800 mAh<br>Integrated directly in the active zone box (automatic connection) |
| | | **OM3 multimode fibre optic cables (50/125 µm)** |
| 2000 | 900 µm Tight buffer<br>0 325 10 | For 50/125 µm multimode installations (OM3)<br>Green jacket<br>10 Gigabit Ethernet compliant<br>Indoor/outdoor (universal)<br>6 fibres |
| 2000 | 0 325 52 | Indoor/outdoor (universal)<br>24 fibres |



# LCS²: your concentrated digital infrastructure

Recommended for areas which require rigorous hygiene.




**1 Fibre optic floor distribution cabinet**
Takes up to 4 fibre optic units.

**2 Copper/fibre optic converter switch**
For converting and distributing the optical signal to four RJ 45 ports.

**3 Active zone distribution box**
For converting the optical signal to five RJ 45 ports.

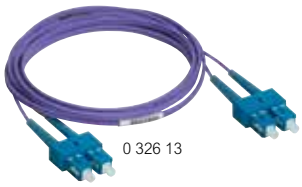
**4 19" fibre optic drawer fitted with 4 SC units**
Modular sliding drawer.

# Legrand cabling system LCS² fibre optic

## patch cords









Technical characteristics **p. 128**

Fitted with 2 connectors with ceramic ferrule at either end
Packed and tested singly (report supplied)
Zipcord LSZH sleeve

| Pack | Cat.Nos | OM2 (UPC) multimode fibre optic cords (50/125 µm) |
|---|---|---|
| | | Max. optical losses: 0.3 dB<br>For 50/125 µm multimode installations, OM2 type<br>Orange sheaths |
| | | **ST/ST duplex cords** |
| 3 | 0 330 80 | Length: 1 m |
| 3 | 0 330 81 | Length: 2 m |
| 3 | 0 330 82 | Length: 3 m |
| | | **SC/SC duplex cords** |
| 3 | 0 330 69 | Length: 1 m |
| 3 | 0 330 70 | Length: 2 m |
| 3 | 0 330 71 | Length: 3 m |
| | | **ST/SC duplex cords** |
| 3 | 0 330 72 | Length: 2 m |
| 3 | 0 330 73 | Length: 3 m |
| | | **LC/LC duplex cord** |
| 3 | 0 330 61 | Length: 2 m |
| | | **SC/LC duplex cords** |
| 3 | 0 330 75 | Length: 1 m |
| 3 | 0 330 63 | Length: 2 m |
| 3 | 0 330 76 | Length: 3 m |
| | | **LC/ST duplex cord** |
| 3 | 0 330 65 | Length: 2 m |

| | | OM4 multimode fibre optic cords (50/125 µm) |
|---|---|---|
| | | 10 Gigabit Ethernet compliant<br>Max. optical losses: 0.3 dB<br>For 50/125 µm multimode installations, OM4 type<br>Blue sheaths |
| | | **SC/SC duplex cords** |
| 3 | 0 326 30 | Length: 1 m |
| 3 | 0 326 31 | Length: 2 m |
| 3 | 0 326 32 | Length: 3 m |
| | | **LC/LC duplex cords** |
| 3 | 0 326 33 | Length: 0.5 m |
| 3 | 0 326 34 | Length: 1 m |
| 3 | 0 326 35 | Length: 2 m |
| 3 | 0 326 36 | Length: 3 m |
| 3 | 0 326 37 | Length: 5 m |

| Pack | Cat.Nos | OS1/OS2 (UPC) singlemode fibre optic cords |
|---|---|---|
| | | Max. optical losses: 0.3 dB<br>For OS1 9/125 µm singlemode installations, OS2 à OS1 type<br>Yellow sheaths |
| | | **SC/SC duplex cords** |
| 3 | 0 326 00 | Length: 1 m |
| 3 | 0 326 01 | Length: 2 m |
| 3 | 0 326 02 | Length: 3 m |
| | | **SC/LC duplex cords** |
| 3 | 0 326 03 | Length: 1 m |
| 3 | 0 326 04 | Length: 2 m |
| 3 | 0 326 05 | Length: 3 m |
| | | **LC/LC duplex cords** |
| 3 | 0 326 28 | Length: 0.5 m |
| 3 | 0 326 06 | Length: 1 m |
| 3 | 0 326 07 | Length: 2 m |
| 3 | 0 326 08 | Length: 3 m |
| 3 | 0 326 29 | Length: 5 m |

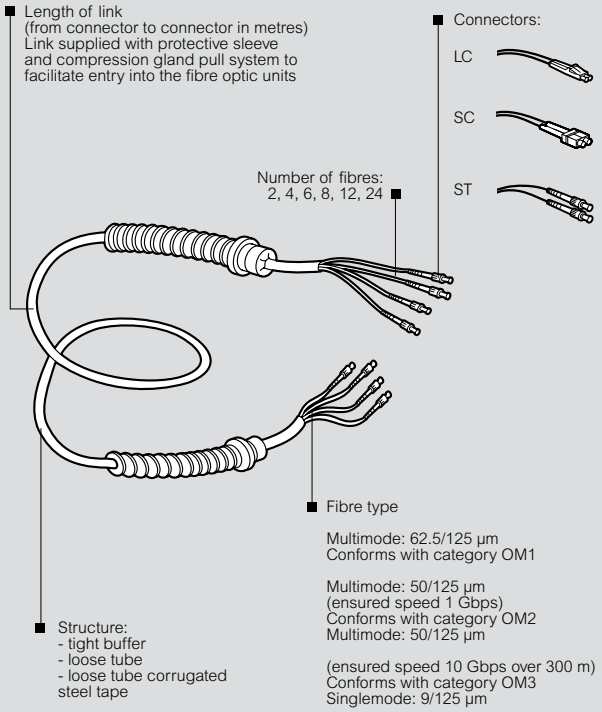
| | | OM3 (PC) multimode fibre optic cords (50/125 µm) |
|---|---|---|
| | | Suitable for 10 Gb Ethernet network<br>Max. optical losses: 0.3 dB<br>For 50/125 µm multimode installations, OM3 type<br>Purple sheaths |
| | | **SC/SC duplex cords** |
| 3 | 0 326 09 | Length: 1 m |
| 3 | 0 326 10 | Length: 2 m |
| 3 | 0 326 11 | Length: 3 m |
| | | **SC/LC duplex cords** |
| 3 | 0 326 12 | Length: 1 m |
| 3 | 0 326 13 | Length: 2 m |
| 3 | 0 326 14 | Length: 3 m |
| | | **LC/LC duplex cords** |
| 3 | 0 326 15 | Length: 1 m |
| 3 | 0 326 16 | Length: 2 m |
| 3 | 0 326 17 | Length: 3 m |

Customised fibre optics
**Customised solutions, p. 106**

# Customised solutions

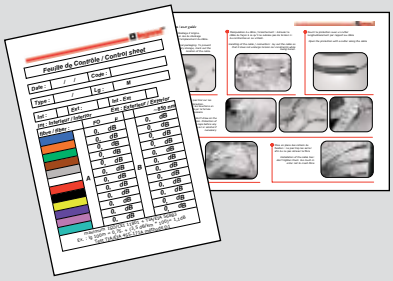
**fibres preterminated with connectors**

## Fibres preterminated with connectors




## Documents

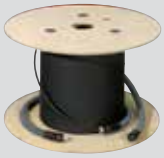
Each link is supplied with a test report (fibre by fibre) and illustrated operating instructions



## Packaging

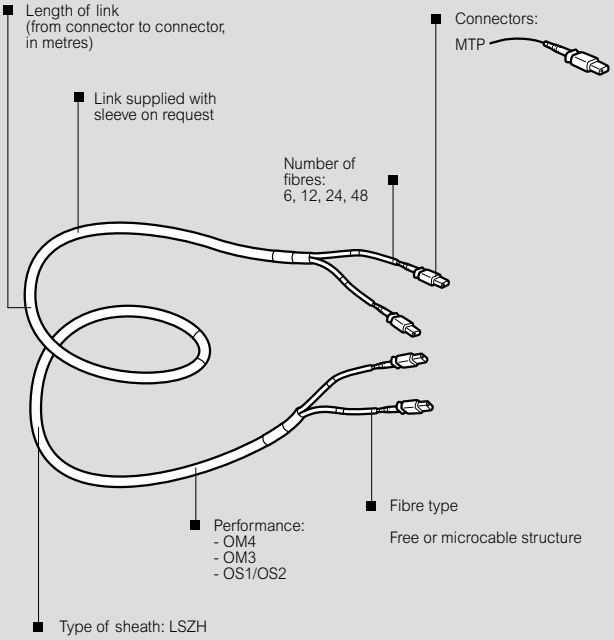
According to length of link:
- packed on a reel
- packed on a ring

Connector protection by tube



Reel

## Fibres preterminated with connectors




## OUR COMMITMENT

Request a quotation from our technical team

# Legrand cabling system LCS² cabinets

## LCS² 19" cabling freestanding cabinets

0 463 41

0 463 34 + 1 cabinet 0 463 18
+ 1 extension cabinet 0 463 30

Technical characteristics **p. 129 to 131**

IP 20 - IK 08 baying cabinets with single or double curved front door made of screen-printed safety glass. Side and rear removable panels Panels with automatic equipotential connection. Lock with 2433 A key for locking of the 4 sides. Top and bottom cable entries (19" cut-out format) receive 19" plates with brushes, fans, etc
Equipped with 4 x 19" uprights with U marking and depth adjusting aid
Option of cable and patch cord management in cabling unit
Cat.Nos 0 463 34/35. Cabinets can be dismantled completely where access is difficult Levelling feet adjustable from the inside. Loading capacity: 420 Kg. Anthracite grey RAL 7016

### LCS² 19" cabling cabinets

**Single front door**
Reversible door

| Pack | Cat.Nos | Capacity | Height (mm) | Width (mm) | Depth (mm) |
|---|---|---|---|---|---|
| 1 | 0 463 00 | 24 U | 1226 | 600 | 600 |
| 1 | 0 463 06 | 29 U | 1448 | 600 | 600 |
| 1 | 0 463 12 | 33 U | 1626 | 600 | 600 |
| 1 | 0 463 18 | 42 U | 2026 | 600 | 600 |
| 1 | 0 463 19 | 42 U | 2026 | 600 | 800 |
| 1 | 0 463 21 | 42 U | 2026 | 800 | 600 |
| 1 | 0 463 22 | 42 U | 2026 | 800 | 800 |
| 1 | 0 463 23 | 42 U | 2026 | 800 | 1000 |
| 1 | 0 463 28 | 47 U | 2248 | 800 | 800 |
| 1 | 0 463 29 | 47 U | 2248 | 800 | 1000 |

**Double front door**
Door opening suitable for small spaces

| Pack | Cat.Nos | Capacity | Height (mm) | Width (mm) | Depth (mm) |
|---|---|---|---|---|---|
| 1 | 0 463 41 | 42 U | 2026 | 800 | 600 |
| 1 | 0 463 42 | 42 U | 2026 | 800 | 800 |
| 1 | 0 463 43 | 42 U | 2026 | 800 | 1000 |

### LCS² 19" extension cabinets

Single front door. No side panels
Supplied with baying kit

| Pack | Cat.Nos | Capacity | Height (mm) | Width (mm) | Depth (mm) |
|---|---|---|---|---|---|
| 1 | 0 463 30 | 42 U | 2026 | 600 | 600 |
| 1 | 0 463 33 | 42 U | 2026 | 800 | 800 |

### LCS² baying kits

For direct linking of 2 LCS² cabinets
For cabinet depth (mm):

| Pack | Cat.Nos | |
|---|---|---|
| 1 | 0 463 37 | 600 |
| 1 | 0 463 38 | 800 |
| 1 | 0 463 39 | 1000 |

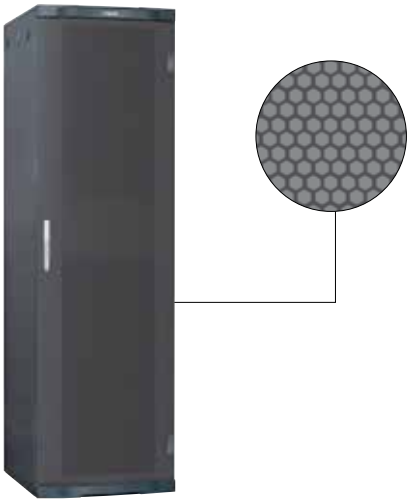
### LCS² cabling units

Can be attached between 2 LCS² 42 U cabinets
Easier cable and patch cord management
Width 250 mm
Supplied with earthing kit
Anthracite grey RAL 7016
For cabinet depth (mm):

| Pack | Cat.Nos | |
|---|---|---|
| 1 | 0 463 34 | 600 |
| 1 | 0 463 35 | 800 |

# Legrand cabling system LCS² cabinets

## LCS² 19" freestanding server cabinets and equipment



0 463 85

Technical characteristics **p. 129 to 131**

IP 20 - IK 08
Baying cabinets with front and rear metal microperforated door (80%), reversibles, can be opened without key
Front door can be fitted with a European DIN cylinder (30 + 10 mm), with option of fitting a handle Cat.No 0 347 71/72 (see Legrand general catalogue)
Rear door can be fitted with a key cylinder Cat.Nos 0 368 22/23/24/25/26/27 (see Legrand general catalogue)
Removable side panels
Top cable entries in 19" cut-out format, capable of taking 19" plates with brushes, fans, etc
Open bottom cable entries
Equipped with 4 x 19" uprights with depth adjusting aid
Levelling feet adjustable from the inside
Cabinets can be dismantled completely where access is difficult
Supplied with earthing kit
Loading capacity: 630 Kg
Anthracite grey RAL 7016

### LCS² 19" server cabinets

| Pack | Cat.Nos | Capacity | Height (mm) | Width (mm) | Depth (mm) |
|---|---|---|---|---|---|
| 1 | 0 463 85 | 42 U | 2026 | 600 | 1000 |
| 1 | 0 463 86 | 42 U | 2026 | 800 | 1000 |

### LCS² baying kit

For direct linking 2 LCS² cabinets
For cabinets depth (mm):

| Pack | Cat.Nos | |
|---|---|---|
| 1 | 0 463 39 | 1000 |

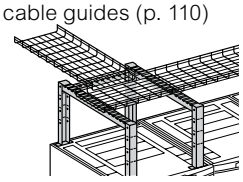
### Accessories for LCS² 19" server cabinets

**Set of 4 caster wheels**

| Pack | Cat.Nos | |
|---|---|---|
| 1 | 0 464 82 | Set of 4 pivoting casters, 2 of which have brakes<br>Load on the 4 wheels: 500 kg |

**Cable guides support**
Fast screw-free assembly of cable guides (p. 110)

| Pack | Cat.Nos | |
|---|---|---|
| 1 | 0 464 78 | For width 600/800 mm<br>Fitted between 2 supports<br>Cat.No 0 464 79 |
| 1 | 0 464 79 | For depth 1000 mm<br>Pre-cut every 100 mm for height 500 to 200 mm |



Plinths, cable entry plates, thermal management, cable management and other accessories, **p. 109 to 112**

LCS² 19" equipment **p. 111**

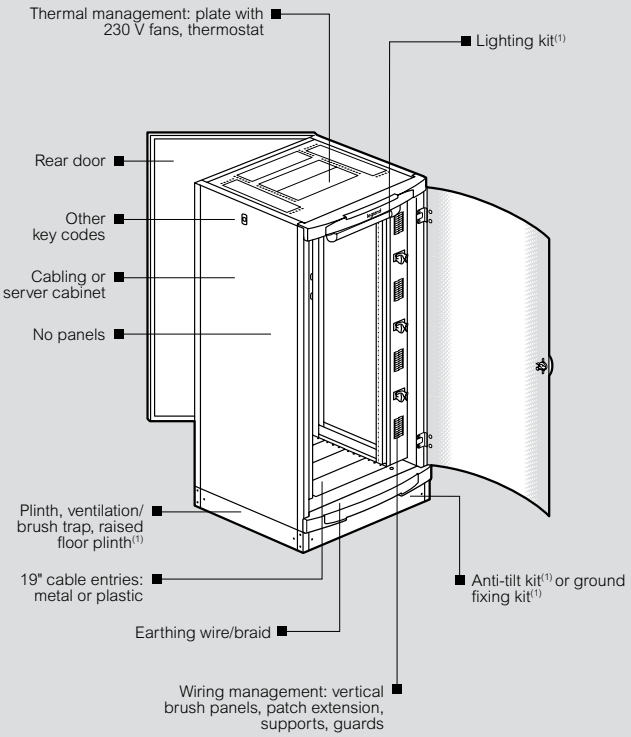
1200 mm deep LCS² server cabinet **please consult us**

## LCS² 19" freestanding cabinets

### 40 SIZES

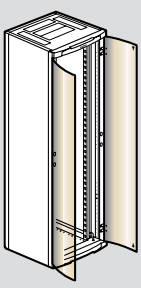
| Capacity | 24 U | 29 U | 33 U | 42 U | 47 U |
|---|---|---|---|---|---|
| Width | 600 or 800 mm | | | | |
| Depth | 600, 800, 1000 or 1200 mm | | | | |

### CABINET DEFINITION

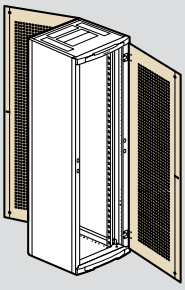



1: Supplied ready for assembly

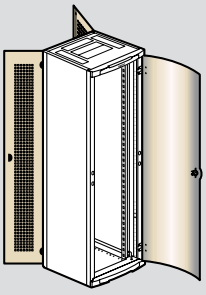
Option of solid or microperforated metal doors, screen-printed glass doors, double doors or no doors



Cabinet fitted with screen-printed glass double door at the front (42 U/47 U; width 800 mm)



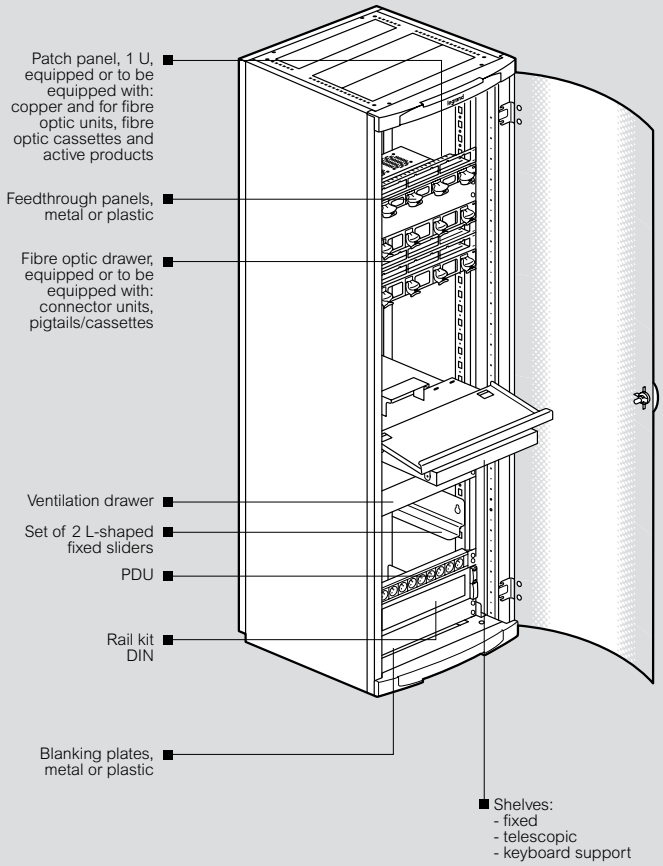
Cabinet fitted with microperforated metal doors at the front and rear (opening to the left)



Cabinet fitted with microperforated metal double rear door and screen-printed glass front door

## LCS² 19" freestanding cabinets (continued)

### 19" EQUIPMENT ASSEMBLY




## Colours

180 RAL colours available.
Optional touch-up brush in the selected RAL

## OUR COMMITMENT

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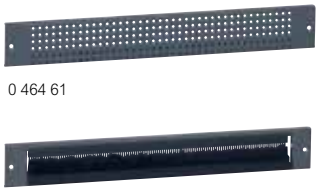
# LCS² 19" cabinets and server cabinets

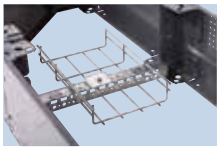
## plinths and adjustable height plinths

Kit 0 464 52 comprising 4 corner blocks and solid traps at front/rear



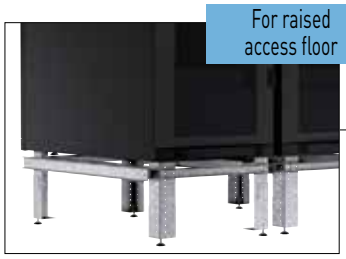
0 464 61

0 464 63



Cross Bar 0 476 93 with cable guide

0 464 66




0 464 32

Technical characteristics **p. 130-131**

### Plinths for cabinets

| Pack | Cat.Nos | | |
|---|---|---|---|
| | | | Metal. Open on 4 sides<br>Anthracite grey RAL 7016 |
| | | | **Plinth kits**<br>Consisting of 4 corner blocks and solid front/rear traps height 100 mm<br>Side traps to be ordered separately |
| | Height 100 | Height 200 | For cabinet width (mm): |
| 1 | 0 464 50 | 0 464 52 | 600 |
| 1 | 0 464 51 | 0 464 53 | 800 |
| | | | **Sets of 2 solid side traps**<br>Trap height 100 mm<br>Order 2 sets for a plinth height of 200 mm (Cat.No 0 464 52/53)<br>For cabinet depth (mm): |
| 1 | 0 464 54 | | 600 |
| 1 | 0 464 56 | | 800 |
| 1 | 0 464 58 | | 1000 |
| | | | **Ventilated traps**<br>1 trap height 100 mm<br>For cabinet width/depth (mm): |
| 1 | 0 464 60 | | 600 |
| 1 | 0 464 61 | | 800 |
| | | | **Traps with brushes**<br>1 trap height 100 mm<br>For cabinet width/depth (mm): |
| 1 | 0 464 62 | | 600 |
| 1 | 0 464 63 | | 800 |

### Plinth for cabling units

| Pack | Cat.Nos | |
|---|---|---|
| 1 | 0 464 64 | For mounting between the plinths of the associated cabinets<br>Trap height 100 mm<br>Double the number of traps for a height of 200 mm<br>Anthracite grey RAL 7016 |

### Cross bars

| Pack | Cat.Nos | |
|---|---|---|
| | | Fixed between 2 cabinet plinth corner blocks<br>For clamping cables between associated cabinets and fixing a cable guide (p. 110)<br>For cabinet depth (mm): |
| 1 | 0 476 93 | 600 |
| 1 | 0 476 94 | 800 |
| 1 | 0 476 95 | 1000 |

### Linking interface

| Pack | Cat.Nos | |
|---|---|---|
| | | Make junction between cabinet plinth and cable tray to protect cables<br>Supplied with weatherproof brush<br>Reversible cover with cut-outs providing a high-quality finish<br>Height 200 mm. Anthracite grey RAL 7016 |
| 1 | 0 464 66 | For cabinet depth 600 mm |

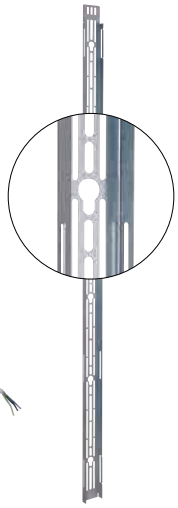
### Adjustable height plinths for raised access floors

| Pack | Cat.Nos | |
|---|---|---|
| | | Transfer the load of the cabinet directly to the ground<br>Height adjustable from 200 to 350 mm in 25 mm steps to adapt to different floor heights<br>Levelling feet for fine adjustment<br>For floor tiles 30 or 38 mm thick<br>Permissible load: 1000 kg |
| | | **Adjustable height plinths**<br>Front and rear floor tile supports included<br>For cabinet width/depth (mm): |
| 1 | 0 464 30 | 600 x 600 |
| 1 | 0 464 31 | 600 x 800 |
| 1 | 0 464 32 | 600 x 1000 |
| 1 | 0 464 34 | 800 x 600 |
| 1 | 0 464 35 | 800 x 800 |
| 1 | 0 464 36 | 800 x 1000 |
| | | **Set of 2 tile support brackets**<br>Fix onto adjustable height plinths to support the side tiles<br>For plinths depth (mm): |
| 1 | 0 464 38 | 600 |
| 1 | 0 464 39 | 800 |
| 1 | 0 464 40 | 1000 |

Adjustable height plinth, depth 1200 mm
**please consult us**

# LCS² 19" cabinets and server cabinets

## cable entries, thermal management and PDU supports

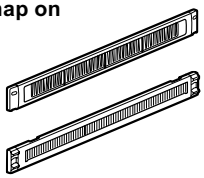



0 464 87

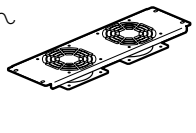
0 465 75

Technical characteristics **p. 131**

| Pack | Cat.Nos | 19" cable entry plates |
|---|---|---|
| | | Black RAL 9005 |
| | | **Plastic plates with brushes, snap on** |
| 1 | 0 465 28 | 1 U |
| 1 | 0 465 29 | 2 U |
| | | **Metal plates with brush** |
| 1 | 0 465 30 | 1 U |
| 1 | 0 465 31 | 2 U |

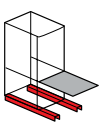


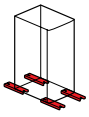
| | | Thermal management |
|---|---|---|
| | | **Plates with fans 3 U** |
| | | Fix onto the 19" cable entries<br>2.5 m power supply cable. 230 V∿<br>Anthracite grey RAL 7016 |
| 1 | 0 464 87 | 2 fans |
| 1 | 0 464 88 | 3 fans |
| | | **1 U ventilation drawers** |
| | | For internal air circulation. Fix on 2 x 19" uprights<br>ON/OFF switch. Supplied with power supply cord<br>230 V∿. Black RAL 9005 |
| 1 | 0 464 89 | Drawer with 2 fans<br>Depth 150 mm |
| 1 | 0 464 90 | Drawer with 4 fans<br>Depth 300 mm |
| | | **Thermostat** |
| 1 | 0 348 48 | Adjustable from 5 to 60°C, 230 V∿, 50/60 Hz<br>NC contact (5 A) and NO contact (10 A)<br>Magnetic mounting |



| | | PDU supports |
|---|---|---|
| | | Vertical support for fixing to the rear of 19" LCS² cabinets and server cabinets (see p. 132). For mounting 19" PDU vertically and vertical PDU |
| 1 | 0 465 75 | For 42 U cabinets |
| 1 | 0 465 76 | For 47 U cabinets |

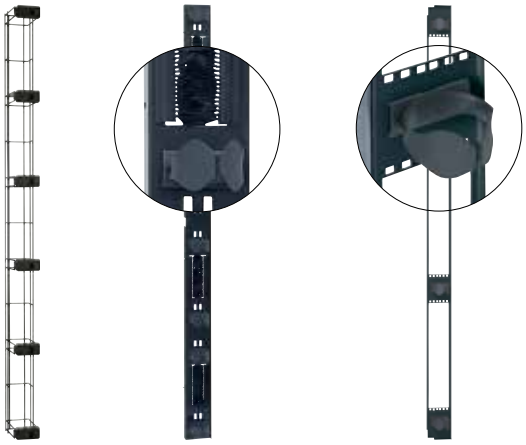
| | | Accessories |
|---|---|---|
| | | **Anti-tilt kit** |
| 1 | 0 464 84 | Stabilises a cabinet when heavy items installed on telescopic equipment are being removed |
| | | **Floor fixing kit** |
| 1 | 0 464 86 | Used for permanently fixing a cabinet to the ground by locking the levelling feet |
| | | **Casters** |
| 1 | 0 464 83 | Set of 4 pivoting casters<br>Total permissible load on the 4 casters: 380 kg |





# LCS² 19" cabinets and server cabinets

## cable management, patch extension



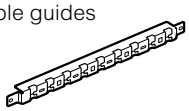
0 331 35

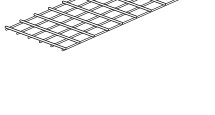
0 464 80

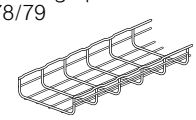
0 464 81

Technical characteristics **p. 132**

| Pack | Cat.Nos | Cable and cord management |
|---|---|---|
| | | **Set of 3 cable management supports** |
| | | Fix on structure<br>Quick, screw-free mounting of cable guides |
| 1 | 0 464 72 | For cabinets width/depth 600 mm |
| 1 | 0 464 73 | For cabinets width/depth 800 mm |
| 1 | 0 464 74 | For cabinets depth 1000 mm |
| | | **Flat cable guides** |
| | | Quick, screw-free mounting on cable management supports<br>Width 250 mm |
| 1 | 0 464 76 | For 33 U cabinet |
| 1 | 0 464 77 | For 42 U cabinets |
| | | **U-shaped cable guides** |
| | | For creating a cable tray<br>Used with cross bars<br>Cat. No 0 476 93/94/95 in a 200 mm high plinth on associated cabinets, and 0 464 78/79 supports on server cabinets<br>Height 54 mm - Length 3 m |
| 1 | 0 464 69 | Width 200 mm |
| 1 | 0 464 70 | Width 400 mm |
| | | **Vertical cable management grille** |
| | | For 42 U cabinets - width 800 mm<br>Fixes onto 19" uprights |
| 1 | 0 331 35 | Grille with articulated bolts<br>1560 x 100 x 150 mm |
| | | **Vertical cable manager** |
| | | For 42 U cabinets - width 800 mm<br>Fixes onto 19" uprights |
| 1 | 0 464 80 | Set of 2 vertical panels with brush feedthroughs<br>Supplied with 10 cable guide rings Cat.No 0 465 42, 3 cable ties Cat.No 0 331 94, 3 cable ties Cat.No 0 331 95 and 3 cable ties Cat.No 0 331 96<br>Black RAL 9005 |







| | | Patch extension |
|---|---|---|
| | | For 42 U cabinets - width 800 mm<br>Fixes onto 19" uprights |
| 1 | 0 464 81 | Set of 2 uprights for increasing the capacity of the cabinet by 12 U, for mounting 19" equipment vertically (feedthrough panels, 19" PDU, etc.)<br>Supplied with 8 cable guide rings Cat.No 0 465 42<br>Black RAL 9005 |

Cable ties, document holders
**p. 117**


0 465 01


0 465 22


0 465 23

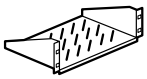

0 465 06

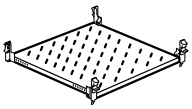

465 29


0 465 32

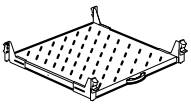
Technical characteristics **p. 131**

| Pack | Cat.Nos | Fixed shelves |
|---|---|---|
| | | For cabinets and server cabinets<br>Quick, screw-free mounting. Black RAL 9005 |
| | | **Projecting mounting on 2 x 19" uprights**<br>Height 2 U. Max. load: 15 kg |
| 1 | 0 465 00 | Depth 115 mm |
| 1 | 0 465 01 | Depth 200 mm |
| 1 | 0 465 02 | Depth 360 mm |
| | | **Fixing on 4 x 19" uprights**<br>Height 1 U. Max. load: 50 kg |
| 1 | 0 465 05 | Shelf depth 425 mm<br>For depth 600 mm |
| 1 | 0 465 06 | Shelf depth 625 mm<br>For depth 800 mm |
| 1 | 0 465 07 | Shelf depth 825 mm<br>For depth 1000 mm |



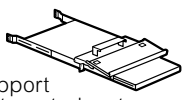


| Pack | Cat.Nos | Telescopic shelves |
|---|---|---|
| | | For cabinets and server cabinets<br>Quick fixing on 4 x 19" uprights<br>Height 1 U. Max. load: 50 kg. Black RAL 9005 |
| 1 | 0 465 08 | Shelf depth 425 mm<br>For depth 600 mm |
| 1 | 0 465 09 | Shelf depth 625 mm<br>For depth 800 mm |
| 1 | 0 465 10 | Shelf depth 625 mm<br>For depth 1000 mm |

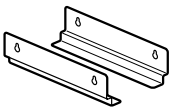


| Pack | Cat.Nos | Shelves for heavy items |
|---|---|---|
| | | Max. load: 100 kg<br>For cabinets depth 1000 mm (server cabinet only for telescopic shelf)<br>Screw fixing on 4 x 19" uprights. Black RAL 9005 |
| 1 | 0 465 17 | Fixed shelf depth 820 mm, 1 U |
| 1 | 0 465 18 | Telescopic shelf<br>depth 820 mm, 2 U |

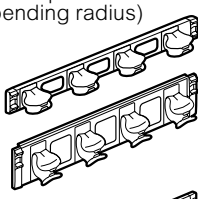
| Pack | Cat.Nos | Keyboard support shelf |
|---|---|---|
| | | For cabinets and server cabinets<br>For depth 800 mm and 1000 mm<br>Screw fixing on 4 x 19" uprights<br>Max. load: 50 kg. Black RAL 9005 |
| 1 | 0 465 19 | Can take:<br>- a computer screen<br>- a keyboard on the retractable support<br>- a mouse on a sliding shelf with integrated mat<br>Area for mouse or CD |

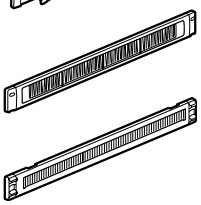


| Pack | Cat.Nos | Sets of 2 fixed sliders |
|---|---|---|
| | | For cabinets and server cabinets<br>Fixing on 4 x 19" uprights<br>Max. load: 50 kg |
| 1 | 0 465 11 | For depth 600 mm |
| 1 | 0 465 12 | For depth 800 mm |
| 1 | 0 465 13 | For depth ≥ 1000 mm |

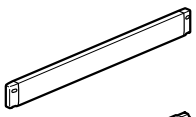


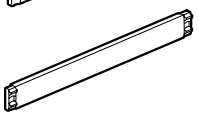
| Pack | Cat.Nos | 19" management panels |
|---|---|---|
| | | For organisation and circulation of patch cords<br>Black RAL 9005 |
| | | **Metal 2 axes, quick-fixing**<br>Horizontal and through run. Fitted with plastic cable guide rings radiating out for optimum protection of the cords (compliance with the bending radius)<br>Quick, screw-free fixing |
| 1 | 0 465 22[1] | 1 U |
| 1 | 0 465 23[1] | 2 U |
| | | **Plastic with brushes, snap on** |
| 1 | 0 465 28[2] | 1 U |
| 1 | 0 465 29[2] | 2 U |
| | | **Metal with brushes, quick-fixing**<br>Quick, screw-free fixing |
| 1 | 0 465 30[1] | 1 U |
| 1 | 0 465 31[1] | 2 U |



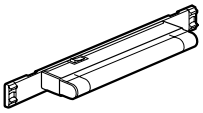


| Pack | Cat.Nos | 19" blanking plates |
|---|---|---|
| | | Black RAL 9005 |
| | | **Plastic, snap on** |
| 1 | 0 465 32[2] | 1 U |
| 1 | 0 465 33[2] | 2 U |
| | | **Metal, quick-fixing**<br>Quick, screw-free fixing |
| 1 | 0 465 38[1] | 1 U |
| 1 | 0 465 39[1] | 2 U |
| 1 | 0 465 40[1] | 3 U |





| Pack | Cat.Nos | 19" lighting kit |
|---|---|---|
| | | 19" metal panel with a lighting kit with switch<br>Quick, screw-free fixing<br>Supplied with<br>230 V∿ - 8 W fluorescent tube |
| 1 | 0 464 85[1] | 1 U |

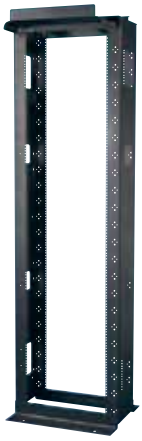


| Pack | Cat.Nos | Fixing screws |
|---|---|---|
| | | Set of 50 cage nuts, 50 plastic washers and 50 x M6 screws |
| 1 | 0 364 53 | With 8.5 mm cage nuts |
| 1 | 0 364 54 | With 9.5 mm cage nuts |

1: Can be mounted on 19" racks with screws Cat.No 0 464 23 (p. 112)
2: Not for mounting on 19" racks

LCS² 19" freestanding cabinets **p. 107**
LCS² 19" wall-mounting cabinets **p. 113**
Cable ties **p. 117**

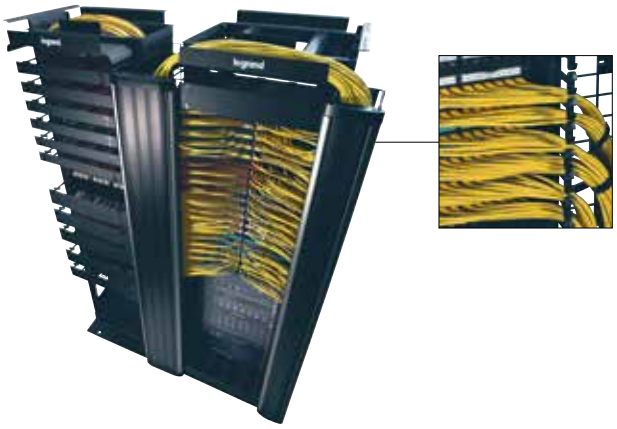
19" screw fixing in tapped holes



0 464 06

0 464 25

0 464 27



0 464 06 + 0 464 27 + 0 464 26 + 0 464 18 + 0 465 70
with LCS² patch panels and cords

Technical characteristics **p. 132-133**

## 19" racks

Racks for high-density cabling (e.g. data centers, SANs, main distributors, etc)
Channel type 19" uprights for guiding and fixing cables, with U marking and tapped holes for fixing 19" equipment
Roofing for right-left cord routing that complies with the bending radiuses
Receive 19" LCS² metal management panels, 19" power distribution units and the LCS² 19" DIN rail kit fastened by screws Cat.No 0 464 23 (1 set of 50 supplied with the rack)
Supplied with straps with hook and loop type closure
Aluminium structure to be assembled
Racks joined using grids Cat.Nos 0 464 25/26/27
Black

| Pack | Cat.Nos | Capacity | Height (mm) | Width (mm) | Depth (mm) | Permissible load (kg) | Depth of uprights (mm) |
|---|---|---|---|---|---|---|---|
| 1 | 0 464 06 | 45 U | 2185 | 604 | 521 | 675 | 267 |
| 1 | 0 464 07 | 45 U | 2185 | 604 | 667 | 675 | 413 |

## Cord management grids

To be mounted between 2 joined racks or on an isolated rack
The grid creates a 63 mm space between 2 joined racks for running cables and cords to the front and rear
Capacity: 200 cat. 6 cords
Black

| Pack | Cat.Nos | |
|---|---|---|
| 1 | 0 464 25 | Grid with hinged closing latches<br>1965 mm x 153 mm x 156 mm |

## Cord management grids with door

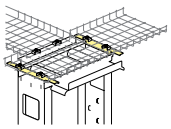
Easily removable door that opens in both directions
To be mounted between 2 joined racks or on an isolated rack (Cat.No 0 464 26 only)
The grids create a space between 2 joined racks (63 mm for Cat.No 0 464 26, 165 mm for Cat.No 0 464 27) for running of cables and cords to the front and rear
Side cord channels every 1 U
Capacity: 200 cat. 6 cords for Cat.No 0 464 26, 580 cords for Cat.No 0 464 27
Supplied with 12 bend limiting clips and 4 coiling supports
Black

| Pack | Cat.Nos | |
|---|---|---|
| 1 | 0 464 26 | 1970 mm x 165 mm x 204 mm |
| 1 | 0 464 27 | 1970 mm x 267 mm x 331 mm |

## Cable tray supports

To be fitted in the depth of the rack to support a high cable tray (Cat.No 0 464 69/70 p. 110)

| Pack | Cat.Nos | |
|---|---|---|
| 1 | 0 464 18 | For rack Cat.No 0 464 06 |
| 1 | 0 464 19 | For rack Cat.No 0 464 07 |



## Lower finishing plates

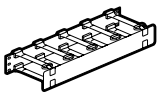
Metal plates provide the finishing of the lower part of the rack and protection against dust
The sides of the plates can be folded easily for direct insertion of cables in the 19" upright channel

| Pack | Cat.Nos | |
|---|---|---|
| 1 | 0 464 15 | For rack Cat.No 0 464 06 |
| 1 | 0 464 16 | For rack Cat.No 0 464 07 |

## 19" cord management panels

1 axis closed panels with pivoting cover
Depth 172 mm
Black

| Pack | Cat.Nos | |
|---|---|---|
| 1 | 0 465 70 | 1 U |
| 1 | 0 465 71 | 2 U |



## 19" equipment screws

| Pack | Cat.Nos | |
|---|---|---|
| 1 | 0 464 23 | Set of 50 special screws for 19" racks and 25 earthing claws |

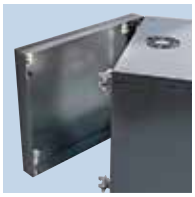
19" metal panels, Power Distribution Units, DIN rail kit
**p. 111, 116, 117**

# Legrand cabling system LCS² cabinets

## LCS² 19" wall-mounting cabinets and accessories

0 462 01

0 462 11



Pivoting cabiinet 0 462 11

0 465 01

Technical characteristics **p. 134 to 135**

IP 20 - IK 08
With reversible curved print screen glass safety door
Pivoting side panels, tool-free removal from inside
Lock closure with key 2433 A
Equipped with 2 x 19" uprights with depth adjusting aid
Supplied with earthing kit
Top and bottom grilles for natural ventilation, capable of taking a fan in the top part
Anthracite grey RAL 7016

### Fixed LCS² 19" cabinets

Easier cable management: ability to fix cable guide connecting rings Cat.Nos 0 465 41/42 and cable ties (p. 117)
DLP format cable entries at the top and bottom, bendable, with ability to attach cables using cable ties
Rear pre-cut cable entries

**Cabinet depth 400 mm**

| Pack | Cat.Nos | Capacity | Width (mm) | Height (mm) | Load capacity (kg) |
|---|---|---|---|---|---|
| 1 | 0 462 00 | 6 U | 600 | 350 | 18 |
| 1 | 0 462 01 | 9 U | 600 | 500 | 27 |
| 1 | 0 462 02 | 12 U | 600 | 600 | 36 |
| 1 | 0 462 03 | 16 U | 600 | 800 | 48 |

**Cabinet depth 580 mm**

| | | | | | |
|---|---|---|---|---|---|
| 1 | 0 462 06 | 9 U | 600 | 500 | 27 |
| 1 | 0 462 07 | 12 U | 600 | 600 | 36 |
| 1 | 0 462 08 | 16 U | 600 | 800 | 48 |
| 1 | 0 462 09 | 21 U | 600 | 1000 | 63 |

### Pivoting LCS² 19" cabinets

Cabinets composed of:
- base (wall-fixing)
- pivoting body allowing free access to the rear of the cabinet to facilitate installation and maintenance
Reversible pivoting direction
Full cable entry plate at top and bottom, a brush plate can be fitted Cat.No 0 462 55

**Cabinet depth 600 mm**

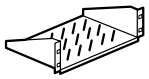
| Pack | Cat.Nos | Capacity | Width (mm) | Height (mm) | Load capacity (kg) |
|---|---|---|---|---|---|
| 1 | 0 462 11 | 9 U | 600 | 500 | 27 |
| 1 | 0 462 12 | 12 U | 600 | 600 | 36 |
| 1 | 0 462 13 | 16 U | 600 | 800 | 48 |
| 1 | 0 462 14 | 21 U | 600 | 1000 | 63 |

### Fixed shelves

Quick fixing without screws
Height 2 U
Max. load 15 kg
Black RAL 9005

**Quick fixing on 2 x 19" uprights**

| Pack | Cat.Nos | |
|---|---|---|
| 1 | 0 465 00 | Depth 115 mm. For cabinets depth 400, 580 and 600 mm |
| 1 | 0 465 01 | Depth 200 mm. For cabinets depth 400, 580 and 600 mm |
| 1 | 0 465 02 | Depth 360 mm. For cabinets depth 580 and 600 mm |



### Thermal management

**Fan**

2.5 m power supply cable

| | | |
|---|---|---|
| 1 | 0 462 60 | 230 V∿ fan |

**Thermostat**

| | | |
|---|---|---|
| 1 | 0 348 48 | Adjustable from 5 to 60°C, 230 V∿, 50/60 Hz<br>NO contact (10A) and NC contact (5 A)<br>Fixed by magnet |

### Cable entry

| | | |
|---|---|---|
| 1 | 0 462 55 | Cable entry plate with brush<br>For pivoting cabinets |

### Cable management rings

Direct clipping onto front structural uprights of 9 U to 21 U fixed cabinets (Cat.No 0 465 41 only) and on central upright of 580 mm depth cabinets

| | | |
|---|---|---|
| 4 | 0 465 41 | 1 U, plastic<br>Usable section 1890 mm² |
| 4 | 0 465 42 | 2 U, plastic<br>Usable section 4070 mm² |

### Accessories

| | | |
|---|---|---|
| 1 | 0 462 64 | Set of 4 caster wheels for assembly on pivoting cabinets<br>Total load permissible on the 4 casters: 120 kg |

19" Power Distribution Units
**p. 116**

LCS² 19" management panels
**p. 111**

# Legrand cabling system LCS² cabinets

## LCS² 10" wall-mounting cabinet for small businesses

0 462 20

0 335 92

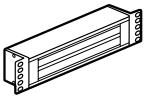
0 462 23

Technical characteristics **p. 134 to 135**

| Pack | Cat.Nos | LCS² 10" cabinet |
|---|---|---|
| | | **300 mm depth cabinet**<br>Compact cabinet suitable for small business applications up to 36 RJ 45 sockets<br>IP 20 – IK 08<br>Equipped with:<br>-1 reversible curved door made of safety glass<br>-2 side panels removable from inside<br>-key locking No 2433A<br>-2 depth-adjustable uprights<br>-top and bottom cable entries to DLP trunking system format<br>-pre-cut back cable entry<br>-top and bottom perforations for natural ventilation<br>Anthracite grey RAL 7016 |
| 1 | 0 462 20 | Capacity: 6 U \| Width (mm): 314 \| Height (mm): 352 \| Load capacity (kg): 12 |

| Pack | Cat.Nos | 10" equipment |
|---|---|---|
| | | Supplied with screws and cage nuts |
| 1 | 0 335 92 | **Modular empty panel**<br>10" panel - 1 U<br>For up to 2 connector units or 2 fibre optic units (p. 83, 99) |
| 1 | 0 462 23 | **Fixed shelf 1 U**<br>Depth 120 mm<br>Max. load. 10 kg<br>Black RAL 9005 |

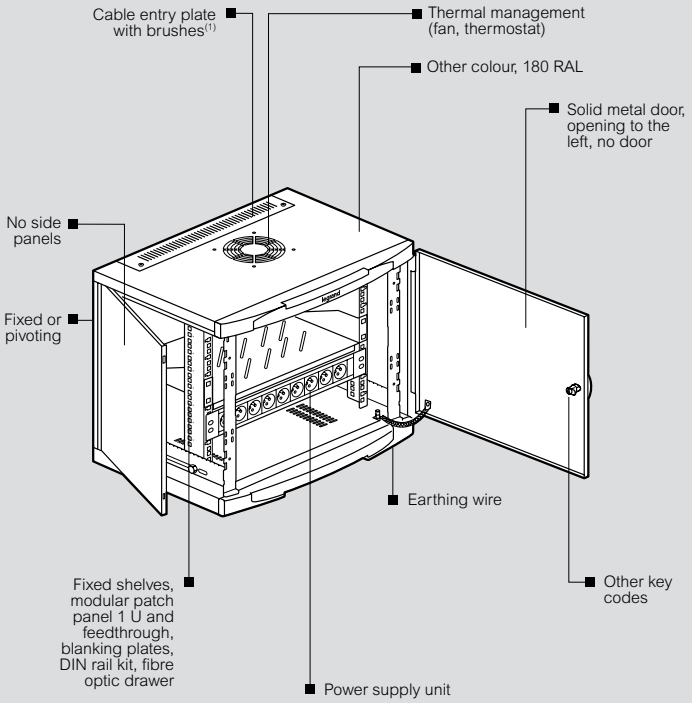
| Pack | Cat.Nos | PDU |
|---|---|---|
| 1 | 0 462 25 | To be equipped with Arteor 2P+E sockets<br>Capacity: 8 modules |



# Customised solutions

## LCS² 19" wall-mounting cabinets

### LCS² 19" wall-mounting cabinets




1: Pivoting cabinets

**OUR COMMITMENT**

Request a quotation from our technical team

# Energy distribution

## metered PDU

0 465 95

Technical characteristics **p. 136**

PDU equipped with a digital display ammeter
For supplying power to active products in 19'' cabinets
Measure consumption to provide better installation management: balancing circuits, displaying available capacity, preventing overloads and power failures
Measure total PDU current for single-phase version and current per phase for three-phase version

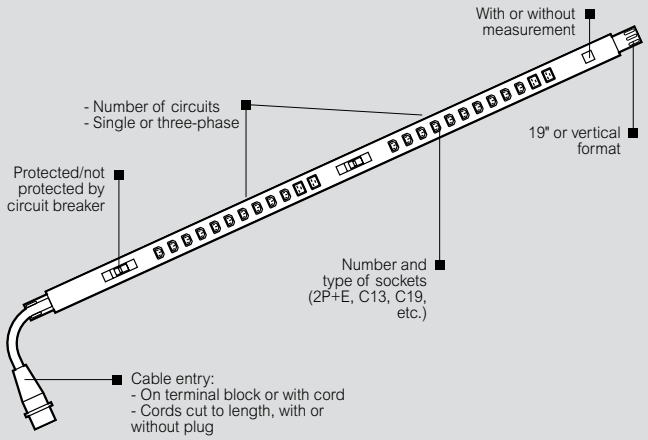
| Pack | Cat. Nos | 19" PDU |
|---|---|---|
| | | For fixing on 19" fixing centres<br>Connection on terminal block<br>Height 1U<br>Supplied with screws |
| 1 | 0 465 90 | 6 x C13 sockets |
| | | **Vertical PDU** |
| | | Protection of each circuit by circuit breaker with a cover providing protection against accidental breaks |
| | | **Single phase**<br>Measurement of the total PDU current<br>230 V 50/60 Hz power supply<br>PDU comprising 2 circuits with 10 IEC 60320 C13 sockets + 2 IEC 60320 C19 sockets<br>Fixing centre: 1700 mm min. - 1735 mm max.<br>H 1750 x W 62 x D 50/85(1) mm |
| 1 | 0 465 93 | 20 x C13 sockets + 4 x C19 sockets<br>Connection on 2.5 - 6 mm² terminal block |
| 1 | 0 465 94 | 20 x C13 sockets + 4 x C19 sockets<br>3 m power supply cord with 32 A IEC 60309 2P+E plug |
| 1 | 0 465 95 | 20 x C13 sockets + 4 x C19 sockets<br>3 m power supply cord with IEC 60320 C20 plug |
| | | **Three-phase**<br>Measurement per phase<br>380 V 50/60 Hz three-phase power supply<br>1 circuit per phase, each with 5 IEC 60320 C13 sockets + 1 IEC 60320 C19 socket<br>Fixing centre: 1738 mm min. - 1772 mm max.<br>H 1787 x W 62 x D 45/85(1) mm |
| 1 | 0 465 96 | 15 x C13 sockets + 3 x C19 sockets<br>3 m power supply cord with 32 A IEC 60309 3P+N+E plug |

1: Overall depth at the circuit breaker slot

# Customised solutions

## PDU

### PDU




**OUR COMMITMENT**

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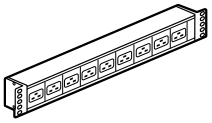
0 465 65

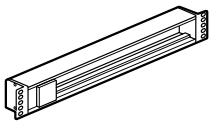
Kit 0 465 46 + 0 465 47

Technical characteristics **p. 136**

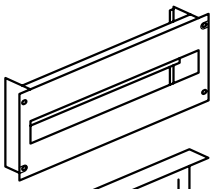
| Pack | Cat.Nos | Vertical Power Distribution Units (PDU) |
|---|---|---|
| | | PDU with protection of each circuit by 16 A circuit breaker (equipped with cover for protection against accidental breaks)<br>Mounting in LCS² cabling and server cabinet with PDU support Cat.Nos 0 465 75/76 (p. 110)<br>Mounting in Varicon-L server cabinet with 2 fixing crosspieces Cat.Nos 6 466 55/57<br>Fixing centres: 1697 mm min - 1703 mm max.<br>H 1720 x W 55 x D 51/88 mm(2)<br>Supplied with screws |
| | | **Single phase**<br>230 V 50/60 Hz power supply<br>PDU comprising 2 circuits<br>The total number of sockets is distributed equally between the 2 circuits Each circuit is identified by colour-coding |
| 1 | 0 465 81 | 24 x C13 sockets<br>Connection on 4/6 mm² terminal block |
| 1 | 0 465 84 | 16 x C13 sockets + 6 x C19 sockets<br>3 m power supply cord with IEC 60309 2P+E plug 16 A |
| | | **3-phase**<br>380 V 50/60 Hz three-phase power supply<br>1 circuit per phase, each with 8 IEC 60320 C13 sockets and 1 IEC 60320 C19 socket |
| 1 | 0 465 85 | 24 x C13 sockets + 3 x C19 sockets<br>3 m power supply cord with IEC 60309 2P+N+E plug 32 A |

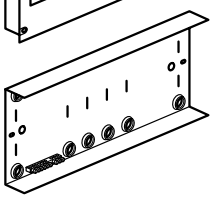
| Pack | Cat.Nos | 19" Power Distribution Units (PDU) |
|---|---|---|
| | | 230 V - 50/60 Hz power supply<br>For fixing on 19" fixing centres<br>180° reversible end piece<br>Connection via 2.5 mm² terminal block<br>Provide a 2 U space<br>Supplied with screws |
| | | **PDU** |
| 1 | 0 465 51[1] | 12 x IEC 60320 C13 sockets |
| 1 | 0 465 52[1] | 9 x IEC 60320 C19 sockets |
| 1 | 0 465 65[1] | 6 x 2P+E black sockets - British standard |
| 1 | 6 339 00[1] | 5 x 2P+E white switch sockets - British standard |
| | | **PDU with voltage surge protector unit** |
| 1 | 6 339 10 | 5 x 2P+⏚ sockets + MCB |
| 1 | 6 339 11 | 6 x 2P+⏚ sockets + switch |
| | | **PDU to be equipped** |
| 1 | 0 332 79[1] | Takes 16 Arteor modules |





| Pack | Cat.Nos | Multi-application DIN rail kit |
|---|---|---|
| | | For mounting modular devices (circuit breakers, Legrand multimedia network components, etc)<br>Capacity: 24 modules<br>Height 4 U<br>Screw fixing on 19" uprights |
| 1 | 0 465 46[1] | DIN profile rail with front panel<br>Supplied with blanking plates<br>24 modules<br>Black RAL 9005 |
| 1 | 0 465 47 | Rear cover<br>Used with Cat.No 0 465 46<br>To be used for high current applications (greater than 50 V)<br>Ensures IP XXB<br>Supplied with terminal block (8 + 1 connections) |





1: Can be mounted on 19" racks with screw Cat.No 0 464 23 (p. 112)
2: Overall depth at the circuit breaker slot

# Cable ties and document holders

0 331 94

0 331 95

0 331 96

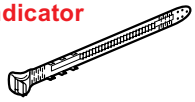
0 331 85

0 331 87

0 320 68

For grouping together and organising audio, computer, VDI, etc, cables
Re-usable (cables can be added)

## Cable ties with tightening indicator



Wide cable ties with patented warning system to prevent overtightening cables
Release by pinching the head of the cable tie
Strap held in place after tightening

| Pack | Cat.Nos | Width (mm) | Length (mm) | Tightening Ø max. | Tightening Ø min. |
|---|---|---|---|---|---|
| 50 | 0 331 94 | 15 | 180 | 35 | 15 |
| 50 | 0 331 95 | 15 | 225 | 50 | 35 |
| 50 | 0 331 96 | 15 | 320 | 80 | 50 |

## Self-locking cable ties

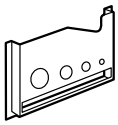
Repositionable cable ties
Double-sided textile with "loops" on one side and "hooks" on the other
Do not damage cables

| Pack | Cat.Nos | Colour | Width (mm) | Length (mm) | Tightening Ø max. (mm) |
|---|---|---|---|---|---|
| 10 | 0 331 84 | Black | 16 | 150 | 35 |
| 10 | 0 331 85 | Red | 16 | 150 | 35 |
| 10 | 0 331 86 | Green | 16 | 150 | 35 |
| 10 | 0 331 87 | Black | 16 | 300 | 80 |
| 10 | 0 331 88 | Red | 16 | 300 | 80 |
| 10 | 0 331 89 | Green | 16 | 300 | 80 |

## Self adhesive base

| Pack | Cat.Nos | |
|---|---|---|
| 50 | 0 320 68 | For cable ties max. width 20 mm<br>Black - 38 x 38 x 9.4 mm<br>Possible central fixing with screw Ø4 mm |

## Self-adhesive document holders



**Open - RAL 7035**

| Pack | Cat.Nos | Ext. dimensions Height (mm) | Ext. dimensions Width (mm) | Int. dimensions Height (mm) | Int. dimensions Width (mm) | Int. dimensions Depth (mm) |
|---|---|---|---|---|---|---|
| 20 | 0 365 80 | 235 | 340 | 200 | 310 | 18 |
| 20 | 0 365 81 | 165 | 260 | 130 | 230 | 18 |

**Closed - RAL 7035**

| | | |
|---|---|---|
| 1 | 0 365 82 | Rigid plastic - IP 50<br>Int. dimensions: 324 x 120 x 18 mm |

**Transparent**

| | | |
|---|---|---|
| 10 | 0 097 99 | Soft plastic, A4 - 305 x 220 mm |

# Legrand cabling system LCS²

## cabinets

| Pack | Cat. Nos | Wall mounting cabinets | Dimensions (mm) H x W x D |
|---|---|---|---|
| | | Wall mounting cabinets equipped with<br>One door made of tinted glass<br>Top & bottom cable entry plates<br>Ventilation grills at sides<br>Black RAL9017 | |
| 1 | 6 348 05* | 6U capacity cabinet | 371.30 x 600 x 500 |
| 1 | **6 348 06** | 9U capacity cabinet | 504.65 x 600 x 500 |
| 1 | **6 348 07** | 12U capacity cabinet | 638 x 600 x 500 |
| 1 | 6 348 08 | 15U capacity cabinet | 771.35 x 600 x 500 |

| Pack | Cat. Nos | Free standing cabinets | Dimensions (mm) H x W x D |
|---|---|---|---|
| | | Free standing cabinets equipped with<br>Reversable door made of Tinted glass<br>Reversal metal rear door<br>Ventillation grills on all sides<br>Cable entry at top and bottom<br>Reducing cable channels through the usable ht Black RAL9017 | |
| 1 | 6 348 00 | 22U capacity cabinet | 1124.9 x 800 x 800 |
| 1 | 6 348 04 | 27U capacity cabinet | 1357 x 800 x 800 |
| 1 | 6 348 01 | 36U capacity cabinet | 1747.2 x 800 x 800 |
| 1 | 6 348 02* | 42U capacity cabinet | 2013.9 x 800 x 800 |

*Product available only in RAL9017

# The right system to meet your needs

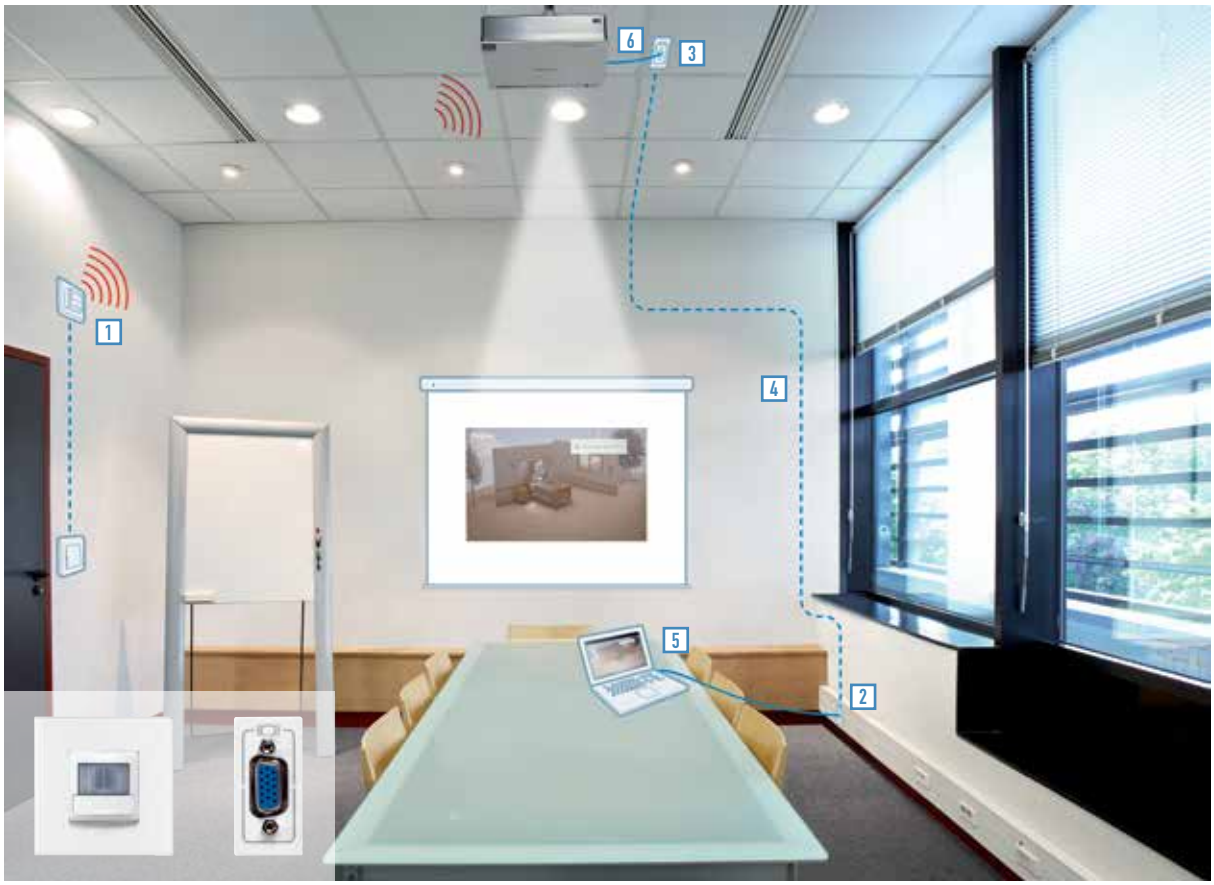
A wide range of technologies (HD15, HDMI, DISPLAY PORT, RCA, JACK) to suit the location and the user requirements

## INSTALLATION EXAMPLE WITH HD15 PRETERMINATED SOCKET AND VIDEO PROJECTOR SWITCH

**1** Quick installation

**2** Easy connection

**3** Optimum performance




1 Infrared ON/STANDBY control for video projector associated with a pushbutton
Cat.No 0 787 99/5 720 89

2 3 Preterminated HD15 sockets
Cat.No 0 787 77/5 720 97

4 10 m male/male HD15 cords
Cat.No 0 517 23

5 6 Male/male HD 15 cords


5 720 97


5 720 96


5 723 70


5 720 89

| Pack | Cat.Nos | Female HD15 sockets |
|---|---|---|
| | | Used to transmit analogue video streams (VGA, XGA, UXGA depending on graphic card) between a source (computer) and a compatible receiver (video projector, TV, etc) |
| | | **Preterminated sockets - 1 module** |
| | Arteor | Equipped with cord, length 15 cm |
| 1 | 5 720 97 | ○ White |
| 1 | 5 725 97 | ● Magnesium |
| | | **Screw-type female HD15 sockets - 2 modules** |
| 1 | 5 722 82 | ○ White |
| 1 | 5 727 82 | ● Magnesium |
| | | **Screw-type female HD15 sockets 2 modules + 3.5 mm Jack** |
| 1 | 5 722 88 | ○ White |
| 1 | 5 727 88 | ● Magnesium |
| | | **Solder-type female HD15 sockets 1 module** |
| | | 15 pin |
| 1 | 5 722 79 | ○ White |
| 1 | 5 727 79 | ● Magnesium |

| Pack | Cat.Nos | HDMI type A sockets |
|---|---|---|
| | | Used to transmit high-definition digital audio/video streams between a source (computer, HD-DVD drive, etc) and a compatible receiver (TV, video projector, etc) |
| | | **Preterminated sockets HDMI 1.4 - 1 module** |
| | Arteor | Equipped with cord, length 15 cm |
| 1 | 5 720 96 | ○ White |
| 1 | 5 725 96 | ● Magnesium |
| | | **Screw-type sockets HDMI 1.3 - 2 modules** |
| 1 | 5 722 81 | ○ White |
| 1 | 5 727 81 | ● Magnesium |

| Pack | Cat.Nos | Jack sockets 3.5 mm |
|---|---|---|
| | | 3.5 mm Jack connectors can be used to create audio/video links |
| | | **Preterminated sockets - 1 module** |
| | Arteor | Equipped with cord, length 15 cm |
| 1 | 5 720 91 | ○ White |
| 1 | 5 725 91 | ● Magnesium |
| | | **4 screw-type female 3.5 mm Jack socket - 1 module** |
| 1 | 5 722 74 | ○ White |
| 1 | 5 727 74 | ● Magnesium |
| | | **Solder-type female 3.5 mm Jack socket - 1 module** |
| 1 | 5 722 78 | ○ White |
| 1 | 5 727 78 | ● Magnesium |

| Pack | Cat.Nos | HD15 + 3.5 mm Jack amplifier |
|---|---|---|
| | | Used to connect audio/video terminals more than 20 m apart up to 100 m<br>The video link is via an HD15 connector (resolution up to UXGA)<br>The stereo audio link is via a 3.5 mm Jack<br>The kit includes:<br>- one 4-module transmitter equipped with an HD15 connector and a 3.5 mm Jack<br>- one 4-module receiver equipped with an HD15 connector and a 3.5 mm Jack<br>- one 4-module power supply to be connected on the mains then linked to the receiver or transmitter<br>The link between the transmitter and receiver is via a network cord RJ 45/RJ 45 |
| 1 | Arteor 5 723 70 | ○ White |

| Pack | Cat.Nos | Infrared ON/STANDBY control |
|---|---|---|
| | | Universal remote switch for turning a video projector on or setting it to STANDBY mode<br>Works with all video projectors or TVs through IR learning process<br>Installed close to the room's light switches, it replaces the manufacturer's remote and is used to switch the video projector on and off, therefore reducing energy consumption and extending the bulb's lifetime |
| 1 | Arteor 5 720 89 | ○ White |

| Pack | Cat.Nos | Display port sockets |
|---|---|---|
| | | Used to transmit high-definition digital audio/video streams between a source (laptop, computer, etc) and a compatible receiver (video projector, TV, etc |
| | | **Preterminated socket - 1 module** |
| 1 | Arteor 5 720 90 / 5 725 90 | Equipped with cord, length 15 cm<br>○ White<br>● Magnesium |

Patch panels, cables and cords
**See p. 122**

# Audio/video system

## audio/video sockets (continued)


5 722 72


5 727 73


5 722 76


5 722 83


5 727 70


5 722 84

| Pack | Cat.Nos | Female 2 RCA socket |
|---|---|---|
| | | Provide the stereo audio link for any peripheral device such as a DVD drive, camera, video recorder<br>1 module |
| | | **Preterminated** |
| | Arteor | Equipped with a 15 cm cord |
| 1 | 5 720 92 | ○ White |
| 1 | 5 725 92 | ● Magnesium |
| | | **Connection via screw terminals** |
| 1 | 5 722 72 | ○ White |
| 1 | 5 727 72 | ● Magnesium |

| Pack | Cat.Nos | Female 3 RCA socket |
|---|---|---|
| | | Provide the composite video and stereo audio links for any peripheral device such as a DVD drive, camera, video recorder, videoconferencing, etc<br>1 module |
| | | **Preterminated** |
| | Arteor | Equipped with a 15 cm cord |
| 1 | 5 720 93 | ○ White |
| 1 | 5 725 93 | ● Magnesium |
| | | **Connection via screw terminals** |
| 1 | 5 722 73 | ○ White |
| 1 | 5 727 73 | ● Magnesium |

| Pack | Cat.Nos | Other audio and video sockets |
|---|---|---|
| | | **Female BNC 75 socket - 1 module**<br>Provides the composite video link for any peripheral device such as a DVD drive, camera, video recorder, etc |
| 1 | 5 722 76 | ○ White |
| 1 | 5 727 76 | ● Magnesium |

| Pack | Cat.Nos | Audio sockets |
|---|---|---|
| | | **XLR 3-pin - 2 modules**<br>Provides the stereo link for microphone, amplifier, mixing console, etc<br>Recommended cable: 1 audio pair 0.14 mm² to 0.5 mm² shielded |
| | Arteor | Max. cable length: 50 m (without amplifier) |
| 1 | 5 722 83 | ○ White - Fast screw connection female |
| 1 | 5 727 83 | ● Magnesium - Fast screw connection female |
| 1 | 5 722 77 | ○ White - Fast screw connection male |
| 1 | 5 727 77 | ● Magnesium - Fast screw connection male |
| | | **Loudspeakers sockets**<br>Terminal 4 mm² |
| 10 | 5 722 80 | ○ White - 2 modules |
| 10 | 5 727 80 | ● Magnesium - 2 modules |
| 10 | 5 722 70 | ○ White - 1 module |
| 10 | 5 727 70 | ● Magnesium - 1 module |
| | | **100 V Line Volume Attenuators - 2 modules**<br>Used to adjust power and volume of a 100 V loudspeaker line |
| 1 | 5 722 84 | ○ White - 100 V - 25 W |
| 1 | 5 727 84 | ● Magnesium - 100 V - 25 W |

# Audio/video system

## audio/video patch panels, cords and cables

0 335 98

0 335 97

0 335 96

0 335 99

0 517 23

0 517 24

| Pack | Cat.Nos | 19" patch panels |
|---|---|---|
| | | Used to distribute the audio/video signal<br>Equipped with marked connectors<br>19" female 1 U metal panels |
| 1 | 0 335 98 | HD15 19" panel - 12 connectors |
| 1 | 0 335 97 | HDMI 19" panel - 16 connectors |
| 1 | 0 335 96 | XLR 19" panel - 16 connectors |
| 1 | 0 335 99 | SUBD9 19" panel - 12 connectors |

| Pack | Cat.Nos | Cords |
|---|---|---|
| | | For connecting a socket to a terminal |
| 1 | 0 517 23 | **HD15 cord**<br>Length 10 m. For connecting an HD15 socket to a video terminal (PC, video projector, etc) |
| 1 | 0 517 22 | **HD15 cord + 3.5 mm Jack**<br>Length 2 m<br>For connecting an HD15 video socket and a 3.5 mm audio Jack to a terminal (PC, video projector) |
| | | **HDMI 1.4 cord**<br>For connecting an HDMI socket to an audio/video terminal (plasma screen, DVD player, home cinema, games console, etc)<br>For use over a distance of more than 10 m, use the HDMI booster Cat.No 0 779 30 |
| 1 | 0 517 26* | Length 1.5 m |
| 1 | 0 517 27* | Length 5 m |
| 1 | 0 517 20* | Length 10 m |
| 1 | 0 779 30 | **HDMI booster**<br>Used to extend an HDMI connection. Consists of 2 female connectors and used as an addition to the HDMI cord (for example cord Cat.No 0 517 20)<br>Does not need external power supply |
| 1 | 0 517 24 | **XLR cord**<br>Length 10 m. For connecting an XLR socket to an audio peripheral (microphone, amplifier, etc) |
| 1 | 0 517 25 | **9-way SUB-D cord**<br>Length 10 m. For RS 232 serial connection (printer, machine screen, etc) |

* to be introduced shortly.

| Pack | Cat.Nos | Cables |
|---|---|---|
| | | For connecting 2 sockets a long distance apart |
| 1 | 0 327 81 | **VGA cables**<br>Length 20 m<br>For full pin connection of HD15 sockets over distances of up to 20 m |
| 1 | 0 327 80 | **HDMI cables**<br>Length 20 m<br>For connecting HDMI sockets over distances of up to 10 m |

Freestanding cabinets
**See p. 107**

# Audio/video system

## kits

5 720 26

5 720 27

| Pack | Cat.Nos | Media Hub |
|---|---|---|
| | | Used to connect several kinds of audio/video devices (computer, camera, video recorder, mp3 player, smartphone, etc) to a specific product and to display and/or listen to these media files on the TV screen Connection via one HDMI cable to a TV Particularly suitable for remote TV connection when it is wall-mounted<br>Inputs: HD15+Jack, HDMI, 3RCA, Bluetooth audio connection<br>Output: HDMI<br>4 modules |
| 1 | 5 720 68 | ○ White |
| 1 | 5 725 68 | ● Magnesium |

| Pack | Cat.Nos | HD15 video kit |
|---|---|---|
| | | Up to 15 m<br>Ideal for classrooms and small meeting rooms<br>Used to transmit analogue video streams (VGA, XGA, UXGA depending on graphic card) between a source (computer) and a compatible receiver (video projector, TV) over a length of 15 m<br>The video link is via an HD15 connector. The kit includes:<br>- 2 female HD15 preterminated sockets<br>1 module<br>- 1 HD15 cord Length 15 m<br>- 1 video projector switch (2 modules) and 1 push-button (2 modules) with supports and plates |
| 1 | 5 720 24* | ○ White |

| Pack | Cat.Nos | Audio/video HD15+3.5 mm Jack amplifier kit |
|---|---|---|
| | | Up to 100 m<br>Ideal for large meeting rooms<br>Used to transmit audio and analogue video streams (VGA, XGA, UXGA depending on graphic card) between a source (computer) and a compatible receiver (video projector, TV) over a length (up to 100 m)<br>The video link is via an HD15 connector and the stereo audio link is via a 3.5 mm Jack<br>The link between the transmitter and receiver is via RJ 45 patch cord (not included)<br>The kit includes:<br>- 1 transmitter HD15+3.5 mm Jack - 4 modules<br>- 1 receiver HD15+3.5 mm Jack - 4 modules<br>- 1 power supply- 4 modules<br>- 2 HD15+3.5 mm cord length 2 m<br>- 1 video projector switch (2 modules) and 1 push-button (2 modules) with supports and plates |
| 1 | 5 720 25* | ○ White |

* to be introduced shortly.

| Pack | Cat.Nos | Audio/video multi-participant transmitter HD15+3.5 mm Jack |
|---|---|---|
| | | Allows the different participants in a meeting room to broadcast a presentation on their PC by pressing the shutter button control without disconnecting the cable from the projector<br>Must be associated with other transmitters and one receiver<br>Can be installed in pop-up, desktop multi-outlet extensions and DLP trunking<br>The video link is via an HD15 connector and the stereo audio link is via a 3.5 mm Jack HD15+3.5 mm Jack cord length 2 m included for connection to a PC<br>Transmitters are connected by RJ 45 patch cord (not included) |
| 1 | 5 720 26* | ○ White - 4 modules |

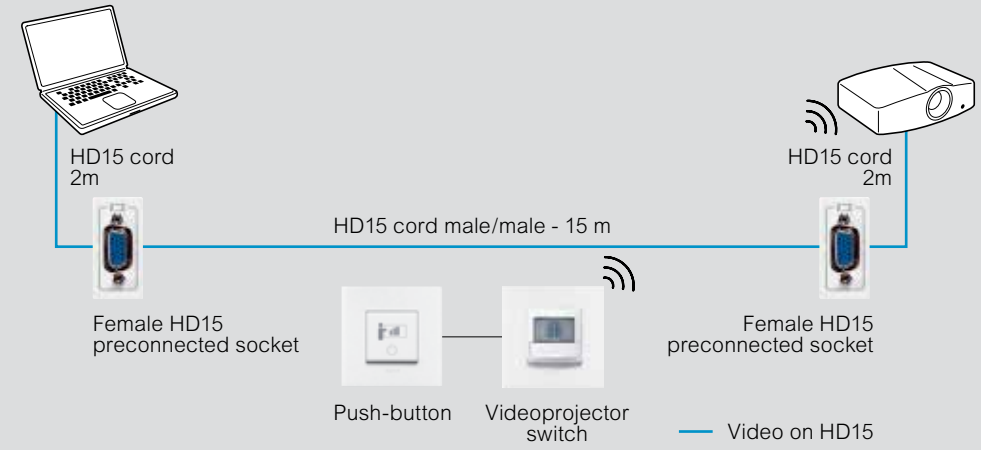
| Pack | Cat.Nos | Audio/video multi-participant receiver HD15+3.5 mm Jack |
|---|---|---|
| | | Receives commands from the audio/video multi-participant transmitter<br>Can be installed in pop-up, desktop multi-outlet extensions and DLP trunking<br>The video link is via an HD15 connector and the stereo audio link is via 3.5 mm Jack<br>HD15 + 3.5 mm Jack cord length 2 m included for connection to a video projector<br>Must be associated with the first transmitter by a RJ 45 patch cord (not included) |
| 1 | 5 720 27* | ○ White - 2 x 4 modules |

* to be introduced shortly.

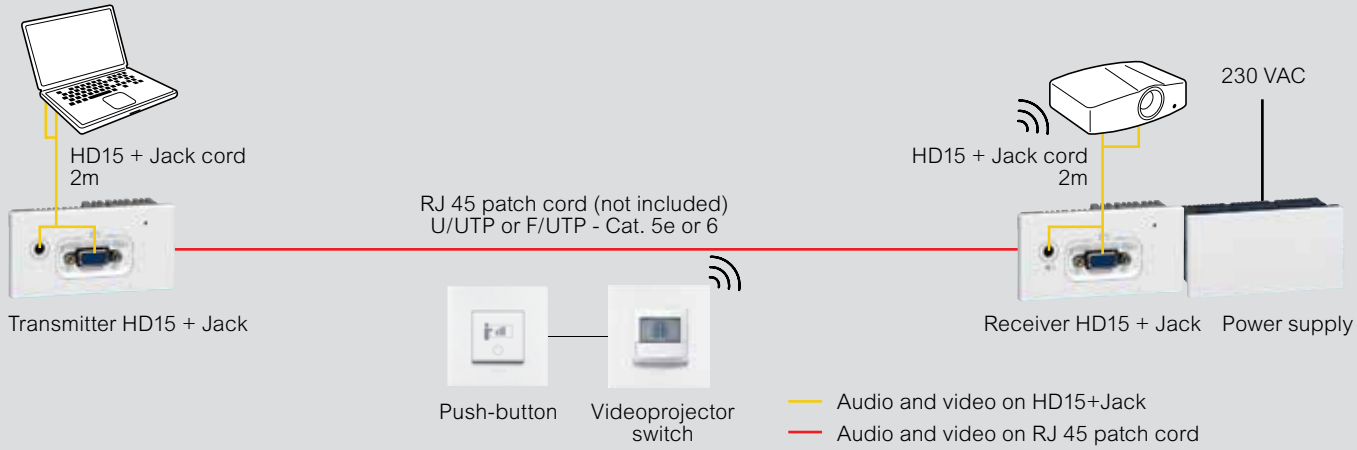
# Audio/video system

**kits**

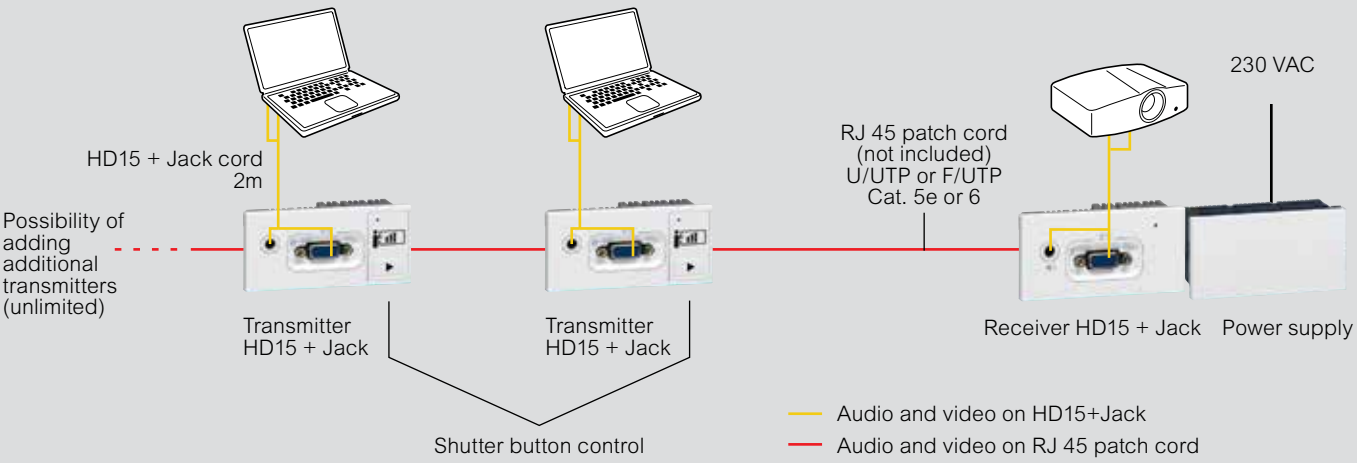
## HD15 video kit (Cat.No 5 720 24)




## Audio/video HD15+3.5 mm Jack amplifier kit (Cat.No 5 720 25)




## Audio/video HD15+3.5 mm Jack multiparticipant transmitter (Cat.No 5 720 26) and receiver (Cat.No 5 720 27)



# Legrand cabling system LCS²

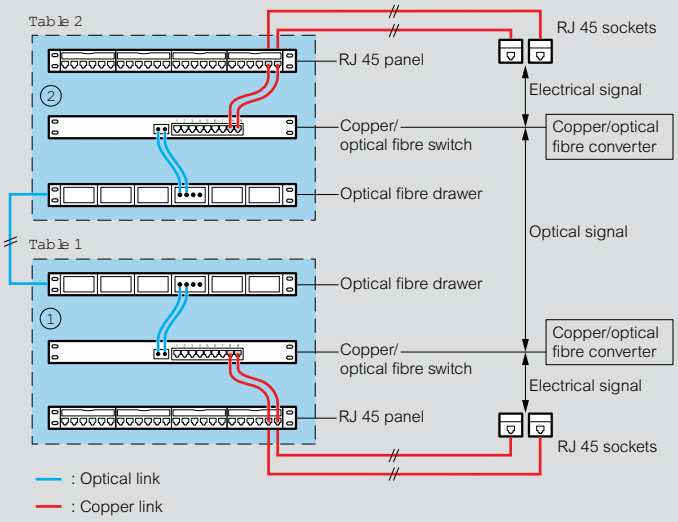
## standards and certification

### New fibre optic classes ISO 11801 2nd Ed.

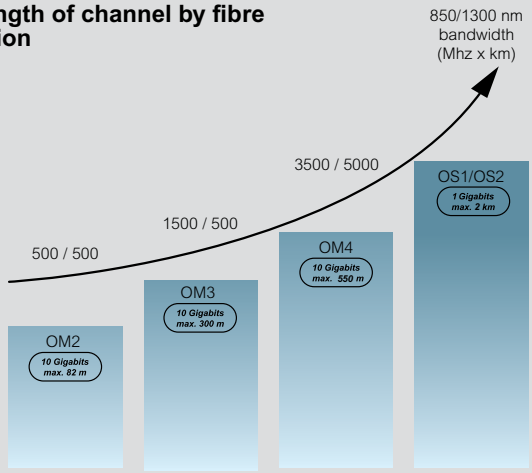
**Parameters of the fibre optic link (ISO 11801/EN 50173)**

| | Multimode | | Singlemode | |
|---|---|---|---|---|
| **Parameter** | **850 nm** | **1300 nm** | **1310 nm** | **1550 nm** |
| **Fibre attenuation dB/km** | 3.5 max. | 1.5 max. | 1.0 | 1.0 |
| **Bandwidth MHz.km** | 200 min. | 500 min. | n/a | n/a |
| **Connector attenuation dB** | 0.75 max. | 0.75 max. | 0.75 max. | 0.75 max. |
| **Return loss dB** | 20 min. | 20 min. | 26 min. | 26 min. |

### Typical layout of a fibre optic link between 2 distribution blocks




### Maximal length of channel by fibre optic application




| Applications | Multimode | | | Singlemode |
|---|---|---|---|---|
| | OM2 | OM3 | OM4 | OS1/OS2 |
| **10 Gigabits Ethernet (S/R base)** | 82 m | 300 m | 550 m(1) | NA |
| **Giga Ethernet (LX base)** | 550 m | 550 m | 550 m | 2 km |
| **Giga Ethernet (SX base)** | 550 m | 550 m | 1100 m | NA |

TIA 568
IEEE 802.3 applications
1: Engineered solution using a max. cabled fibre attenuation of 3.0 dB/km. If not distance is 400 m

### Compliance of LCS² systems with standards and certifications

LCS² systems and components (de-embedded) conform to the following standards:
- TIA/EIA 568C
- EN 50173-1 and EN 50173-2
- ISO/IEC 11801 version 2

The LCS² system supports 10GBase-T applications up to 100 m in a transmission channel
Conforms with standards ISO/IEC 24750, TIA TSB 155 and IEEE 802.3
The EA link class of the LCS² system also conforms with amendment 1 (04/2008) of standard ISO 11801 and its components conform with amendment 2
LCS² systems are certified by expert independent laboratory 3P

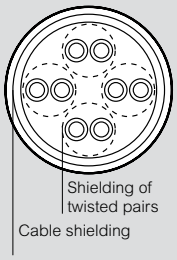
### Main characteristics of LCS² systems

| | LCS² 6A | | LCS² 6 | | LCS² 5e |
|---|---|---|---|---|---|
| **Frequency** | 500 Mhz | | 250 MHz | | 100 Mhz |
| **Speed** | 10 Gbps | | 1 Gbps | | 1 Gbps |
| **Wiring** | Copper | FO | Copper | FO | Copper |
| **Connectors** | RJ 45 | SC-LC… | RJ 45 | SC-LC… | RJ 45 |
| **Max. cable length** | 100 m | variable | 100 m | variable | 100 m |

### New names for LAN cables (according to ISO 11801-2)

They correspond to: "type of cable shield"/ "type of twisted pair shield"
TP monitoring (for twisted pairs)

| Type of cable | | Cable shielding | Twisted pair shielding |
|---|---|---|---|
| **old name** | **new name** | | |
| SSTP | S/FTP | S: screen made up | F: screen formed a metal braid of an aluminium and polyester ribbon |
| SFTP | SF/UTP | SF: combination of ribbon + braid | U: no screen |
| STP | U/FTP | U: no screen | F: screen formed of an aluminium and polyester ribbon |
| FTP | F/UTP | F: screen formed of an aluminium and polyester ribbon | U: no screen |
| UTP | U/UTP | U: no screen | U: no screen |



## Zone distribution boxes

**Compliance with standards:**

Zone distribution box: TIA/EIA 568
UTE C 15-900
NF C 15-100 - NF C 20-730
EN 50-174.2
ISO 11801
EN 50173
IEC 60950

Cords and cables: ISO 11801 id.2.0, EN 50173-1, TIA/EIA 568

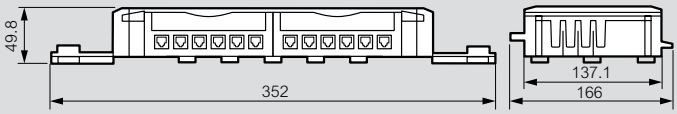
**General characteristics:**

- 6 or 12 incoming ports (depending on Cat.No)
RJ 45 wiring
- 4, 8 or 12 outgoing ports (depending on Cat.No) maximum
Connection of mixed cords via RJ 45 connector
(RJ 45/stripped)
- UTP and FTP versions
- Cat. 5e, 6 and $6_A$
- for computer applications; telephone, access control, etc

**Technical characteristics:**

- Material: Polycarbonate PC hood
Polypropylene PP base
- Colour: RAL 7035
- Weatherproofing protection index: IP 21
- Mechanical impact protection index: IK 07
- Holding strength of connector units in the box: 100 N
- Cables anchored on support using Colring cable ties

**Dimensions**




**Performance**

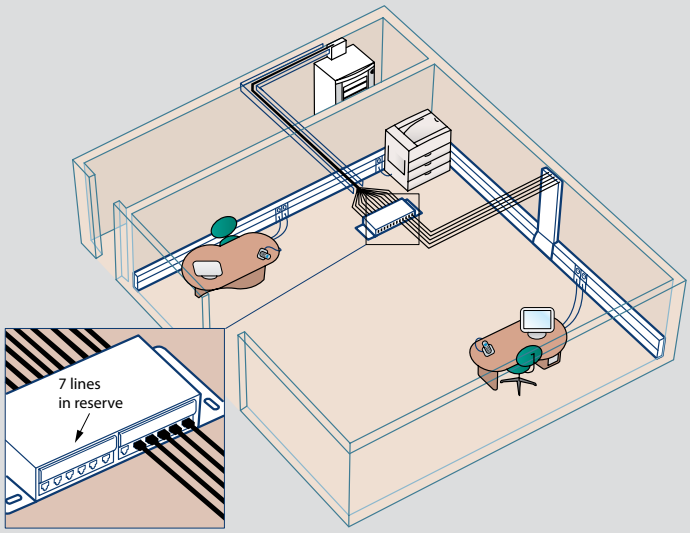
Maximum recommended lengths of links to ensure high performance of the systems with the use of RJ 45 sockets with copper feedthroughs and/or RJ 45 sockets

| | Associated lengths (m) | | |
|---|---|---|---|
| | Cords | Cables | Links |
| Cat. $6_A$ | 8<br>15<br>20 | 70<br>60<br>55 | 78<br>75<br>75 |
| Cat. 6 | 8<br>15<br>20 | 70<br>60<br>55 | 78<br>75<br>75 |
| Cat. 5e | 8<br>15<br>20 | 75<br>65<br>60 | 83<br>80<br>80 |

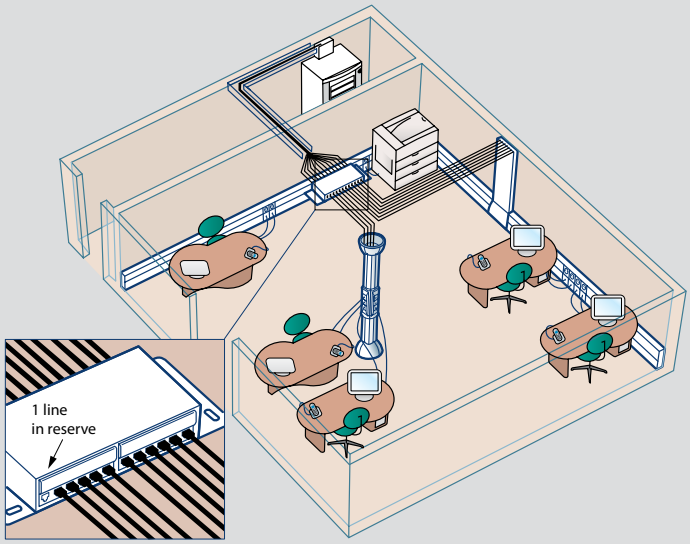
We recommend selecting the shortest wiring lengths for more flexibility regarding cord length in the event of reconfiguration

**Application example**

A zone distribution box is installed to connect the RJ 45 sockets and meet the future requirements of the installation




Connection to additional RJ 45 sockets is done by adding RJ 45 - RJ 45 cords between the unit and the RJ 45 sockets with copper feedthrough



## Flush-mounting 10/100 Base-T Ethernet switches

| | 0 779 00 | 0 779 01 |
|---|---|---|
| **Power supply** | 230 V | PoE |
| **Speed** | 100 Mbps | |
| **Standards** | 802.3/802.3u | 802.3u<br>802.3 af |
| **Common technical characteristics** | • Operating temperature: from 0°C to +40°C<br>• Max. permissible humidity level: 95%<br>• Auto MDI-X (takes crossed and straight cords)<br>• Orange LED: - on: speed of 100 Mbps<br>- off: speed 10 Mbps<br>• Green LED on: traffic | |

## Wi-Fi access points

### An 802.11 a and b/g/n solution

| **Radio communication standard** | 802.11 b/g | 802.11 a | 802.11 b/g/n or 802.11 a/n |
|---|---|---|---|
| **Power supply standard Power over Ethernet** | 802.3 af | | |
| **Frequency band** | between 2.40 and 2.48 GHz | 5 GHz | 2.4 GHz or 5 GHz |
| **Number of available channels** | 13 | 8 | 40 MHz or 20 MHz |
| **Max. gross speed** | 54 Mbps | 54 Mbps | 300 Mbps |

## Benefits of a Legrand Wi-Fi access point

- Possibility of simultaneous operation on 2 frequencies, a and b/g
New products: invited access: used to allocate a network dedicated to visitors
Provides a max. gross speed of up to 2 x 54 Mbps in simultaneous mode
- Very high security level: WPA2 encryption (802.11i) and authentication (802.1x)
- Possibility of roaming (moving from one access point to another without breaking the link)
- Quality of service (priority automatically given to voice, then video and finally data)
- Easy to configure and make secure: using the CD supplied with the access point

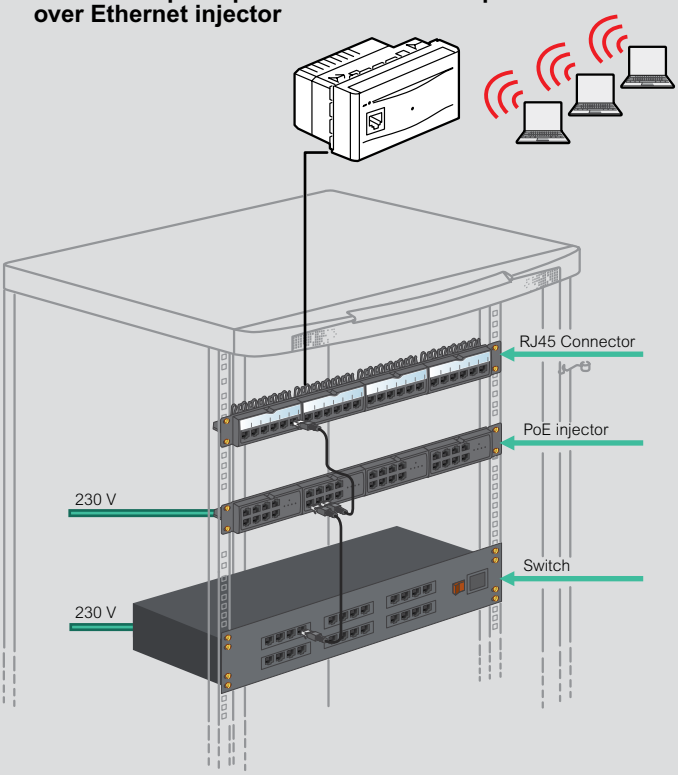
## Installation

In all supports able to take a Arteor mechanism (trunking, columns, flush-mounting boxes, floor boxes, etc)
Do not place access points behind anything that could limit the antenna's range
Access points are connected tool-free via an RJ 45 connector

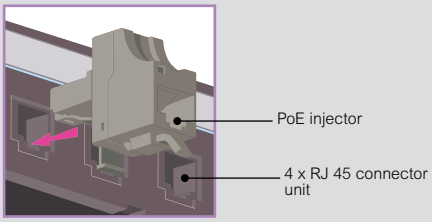
## Sizing

- Provide 1 access point for 1 localised requirement (in entrance hall)
- Provide 1 access point per 100 m² for overall coverage and a maximum gross speed
- Provide 1 access point with an RJ 45 socket for a desk used by visitors

## Installation principle for a Wi-Fi access point with Power over Ethernet injector

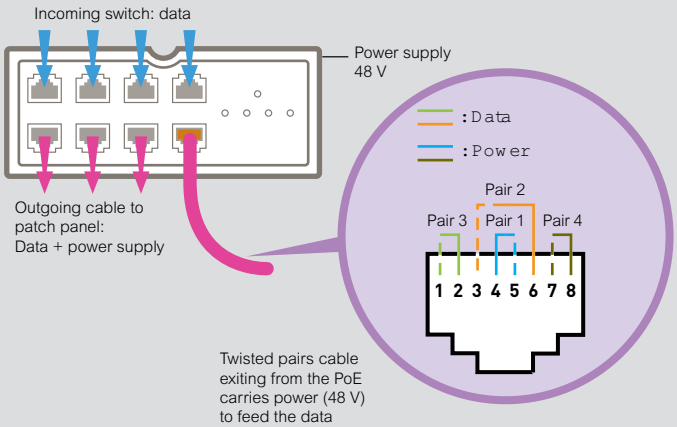



Particular case of the 1 port PoE: Clips directly onto a port on any patch panel A single cord is necessary to connect it to a port on the switch




## Operation of PoE injector

A PoE injector has one input and one output per access point to be supplied




## Legrand services

The Relations Pro(1) service will work with you and guide you in setting up your VDI sites, offering:
- help with sizing the installation
- on-site assistance for integrating products and making important installations secure
Advisors are also available to answer all your technical questions

1: 0810 48 48 48 (local call rate) Monday to Friday 8am to 6pm

## Technical characteristics

- Connection of connectors on 900 µm fibre
- Maximum attenuation: 0.3 dB
- Ideal for high-speed systems: 10 gigabit Ethernet
- Operating temperature: 0 to 65°C
- Shallow connectors

## Advantages:

- High quality finish
- Can be reused 5 times
- Shallow connector, depth less than 40 mm
- Connector factory pre-polished and does not require any glue
- No special tools, easy to transport
- Speed of installation: simple connection process, quick training

It takes less than five seconds to fit the connector

## The basic steps

### Preparation of the fibre:

Stripping

Cleaving

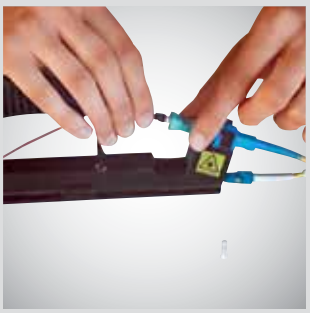
Inspection

### Connection:

1/ Insert the fibre into the connector

2/ Slide the switch on the connector - the splice is done

3/ Slide the boot onto the connector

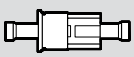


Finally, the visual fault locator is used to check the connection.

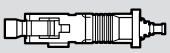
## Rapid crimping connectors with tool case Cat.No 0 326 90

### Types of connector

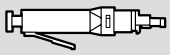
- ST connector: Helical shape locked by "push and turn" bayonet type connector



- SC connector: Rectangular shape "push-pull" latch type locking
  Suitable for a large number of active devices
  Recommended in the generic standards ISO/IEC 11801 and EN 50173



- LC connector: Rectangular shape tab locking
  Half the size of a conventional connector



# Legrand cabling system LCS²

## LCS² 19"cabling and server freestanding cabinets

### General characteristics

Extendable metallic cabinets. RAL 7016 textured polyester coating providing excellent resistance to corrosion and scratching
Front door made of safety glass, front and rear microperforated metal doors for server cabinets
Protection index (weatherproof) against solid objects and liquids: IP 20.
Protection index against mechanical impact: IK 08
Perforations in 19" uprights: 9.5 x 9.5 mm
Loading capacity: 420 kg for cabling cabinet
630 kg for server cabinet

### Compliance with standards

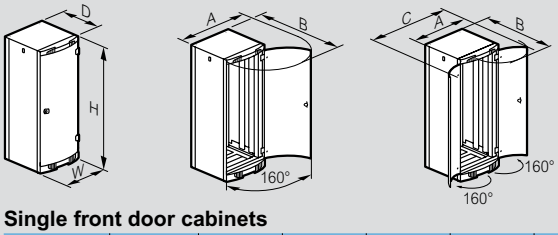
LCS² cabinets comply with the following standards:

| | |
|---|---|
| **IEC 60529 EN 60529** | (NF C 20-010) Degrees of protection provided by enclosures (IP code) |
| **IEC 62262 EN 62262** | (EN 50102, NF C 20-015) Degree of protection provided by enclosures of electrical equipment against external mechanical impacts (IK code) |
| **IEC 60950-1 EN 60950-1 C 77-210-1** | Safety of data processing equipment |
| **EIA-310-E** | Cabinets, enclosures, panels and associated equipment (ANSI/EIA/310-E-2005) |
| **IEC 60297-3-100 DIN 41414-7** | (NF C 20-150, NF C 20-151) Sizes of mechanical structures of the 482.6 mm (19 in) series |

LCS² cabinets can be integrated into installations complying with the following standards:

| | |
|---|---|
| **EN 50173-1** | Information technology - Generic cabling systems |
| **EN 50174-1 and 2 C 90-480-1 and 2** | Information technology - Cabling installation |
| **ISO IEC 11801** | Information technology - Generic cabling for customer premises |
| **NF C 15-100 Part 4-41** | Low voltage electrical installations - Recommendations |
| **IEC 60364-4-41** | Low voltage electrical installations<br>- Protection for safety<br>- Protection against electric shock |

### Overall dimensions (mm)




**Single front door cabinets**

| Cat.Nos | Capacity | H(1) | W | D | A | B |
|---|---|---|---|---|---|---|
| 0 463 00 | 24 U | 1226 | 610 | 659 | 1138 | 1208 |
| 0 463 06 | 29 U | 1448 | | | | |
| 0 463 12 | 33 U | 1626 | | | | |
| 0 463 18/30 | 42 U | 2026 | | 859 | | 1408 |
| 0 463 19 | | | 810 | 657 | 1525 | |
| 0 463 21 | | | | 857 | | 1608 |
| 0 463 22/33 | | | | 1057 | | 1808 |
| 0 463 23 | | | | 857 | | 1608 |
| 0 463 28 | 47 U | 2248 | | 1057 | | 1808 |
| 0 463 29 | | | | | | |

**Double front door cabinets**

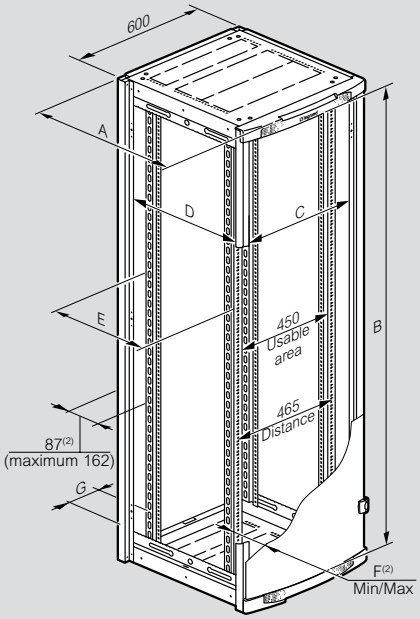
| Cat.Nos | Capacity | H(1) | W | D | A | B | C |
|---|---|---|---|---|---|---|---|
| 0 463 41 | 42 U | 2026 | 810 | 657 | 1165 | 815 | 1535 |
| 0 463 42 | | | | 857 | | 1015 | |
| 0 463 43 | | | | 1057 | | 1215 | |

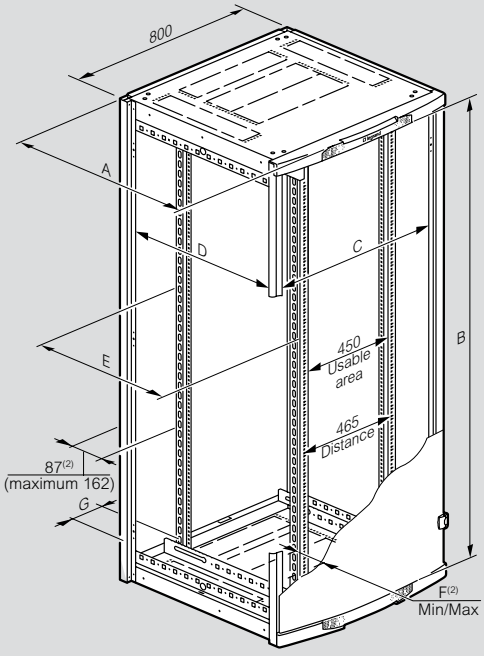
**Server cabinets**

| Cat.Nos | Capacity | H(1) | W | D | A | B |
|---|---|---|---|---|---|---|
| 0 463 85 | 42 U | 2026 | 610 | 1086 | 1160 | 1655 |
| 0 463 86 | 42 U | 2026 | 810 | 1096 | 1550 | 1858 |

1: Without adjustment levelling feet (+ 15 to 45 mm with feet)

### Usable dimensions




2: Continuous adjustment with adjustments in widths of 12.5 mm

**Single front door cabinets**

| Cat.Nos | Capacity | A | Usable area B | Usable area C | Usable area D | E | F(2) Min. | F(2) Max. | G |
|---|---|---|---|---|---|---|---|---|---|
| 0 463 00 | 24 U | 659 | 1086 | 490 | 490 | 425 | 118 | 193 | 41 |
| 0 463 06 | 29 U | | 1308 | | | | | | |
| 0 463 12 | 33 U | | 1486 | | | | | | |
| 0 463 18/30 | 42 U | 859 | 1886 | | 690 | 625 | 122 | 197 | 141 |
| 0 463 19 | | 657 | | 690 | 490 | 425 | | | |
| 0 463 21 | | 857 | | | 690 | 625 | | | |
| 0 463 22/33 | | 1057 | | | 890 | 825 | | | |
| 0 463 23 | 47 U | 857 | 2108 | | 690 | 625 | | | |
| 0 463 28 | | 1057 | | | 890 | 825 | | | |
| 0 463 29 | | | | | | | | | |

**Double front door cabinets**

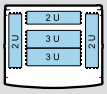
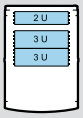
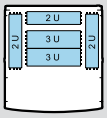
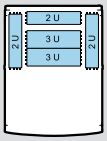
| Cat.Nos | Capacity | A | Usable area B | Usable area C | Usable area D | E | F(2) Min. | F(2) Max. | G |
|---|---|---|---|---|---|---|---|---|---|
| 0 463 41 | 42 U | 657 | 1886 | 690 | 490 | 425 | 122 | 197 | 141 |
| 0 463 42 | | 857 | | | 690 | 625 | | | |
| 0 463 43 | | 1057 | | | 890 | 825 | | | |

**Server cabinets**

| Cat.Nos | Capacity | A | Usable area B | Usable area C | Usable area D | E | F(2) Min. | F(2) Max. | G |
|---|---|---|---|---|---|---|---|---|---|
| 0 463 85 | 42 U | 1086 | 1886 | 490 | 890 | 825 | 75 | 150 | 41 |
| 0 463 86 | | 1096 | | 690 | | | | | 141 |

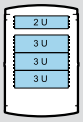
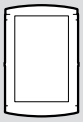
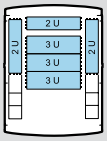
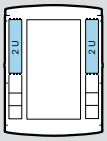
## LCS² cabling cabinet cable entries (mm)

Pre-cut at the top and bottom in 19" format (usable area 451 mm)

| | Width 600 | Width 800 |
|---|---|---|
| Depth 600 |  |  |
| Depth 800 |  |  |
| Depth 1000 | - |  |

## LCS² server cabinet cable entries (mm)

Pre-cut at the top in 19" format (usable area 451 mm)
Bottom central cut (805 x 450 mm)

| | Top | Bottom |
|---|---|---|
| Width 600 |  |  |
| Width 800 |  |  |

## Weight of cabling cabinets (kg)

Weights shown correspond to net weight (without packaging)

| Cat.Nos | Weight Cabinet | Weight Extension cabinet |
|---|---|---|
| 0 463 00 | 69 | - |
| 0 463 06 | 77 | - |
| 0 463 12 | 84 | - |
| 0 463 18/30 (ext) | 99 | 72 |
| 0 463 19 | 110 | - |
| 0 463 21 | 114 | - |
| 0 463 22/33 (ext) | 127 | 90 |
| 0 463 23 | 151 | - |
| 0 463 28 | 138 | - |
| 0 463 29 | 163 | - |
| 0 463 41 | 114 | - |
| 0 463 42 | 127 | - |
| 0 463 43 | 151 | - |

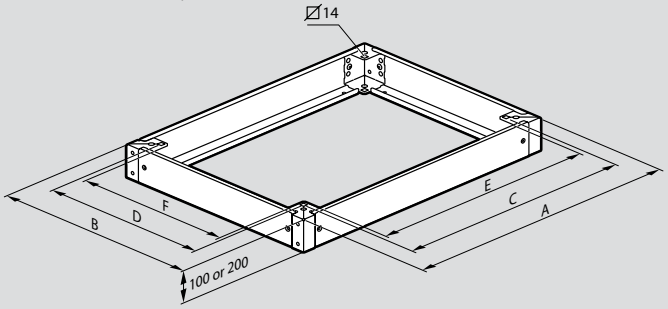
## Weight of server cabinets (kg)

Weights shown correspond to net weight (without packaging)

| Cat.Nos | Weight Cabinet |
|---|---|
| 0 463 85 | 155 |
| 0 463 86 | 166 |

## Cabinet plinths (mm)

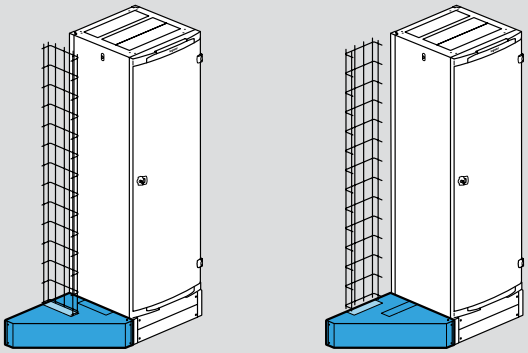
Base kit + side traps

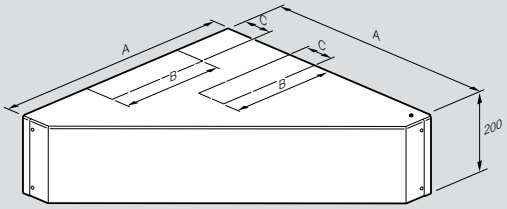



| Cabinet dim. Width x Depth | Overall | | Mounting | | Usable area | |
|---|---|---|---|---|---|---|
| | A | B | C | D | E | F |
| 600 x 600 | 599 | 599 | 478 | 478 | 449 | 449 |
| 600 x 800 | 599 | 799 | 478 | 678 | 449 | 649 |
| 800 x 600 | 799 | 599 | 678 | 478 | 649 | 449 |
| 800 x 800 | 799 | 799 | 678 | 678 | 649 | 649 |
| 600 x 1000 | 599 | 999 | 478 | 878 | 449 | 849 |
| 800 x 1000 | 799 | 999 | 678 | 878 | 649 | 849 |

## Linking interface (mm)

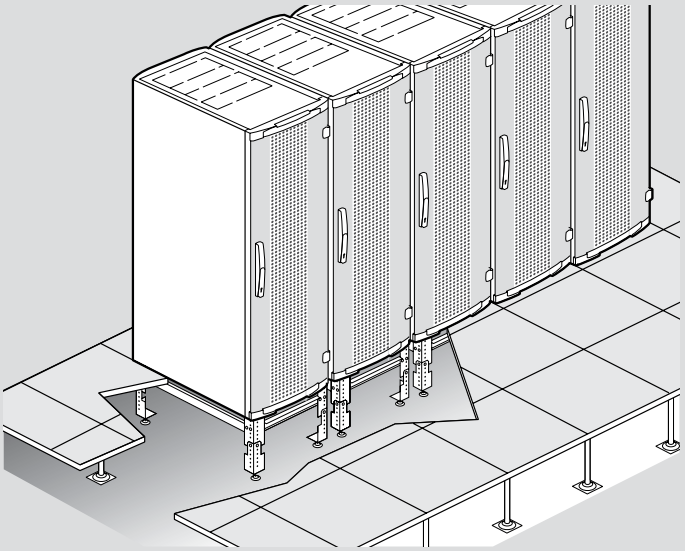
Left or right assembly of a cabinet fitted with a 200 mm high base
Reversible interface cover

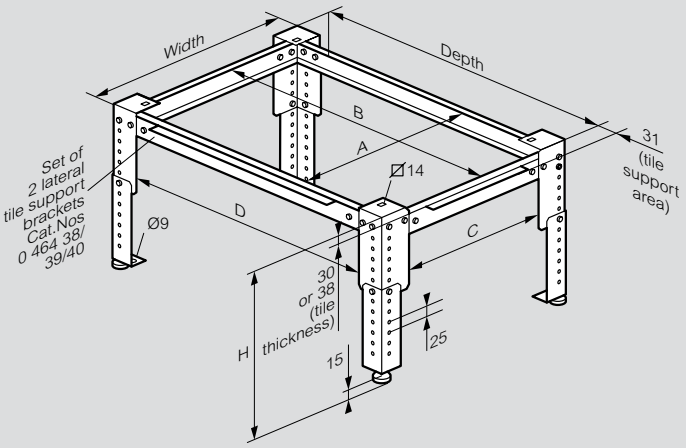





| Cabinet dim. Depth | A | B | C |
|---|---|---|---|
| 600 | 595 | 435 | 120 |

## Adjustable height plinths

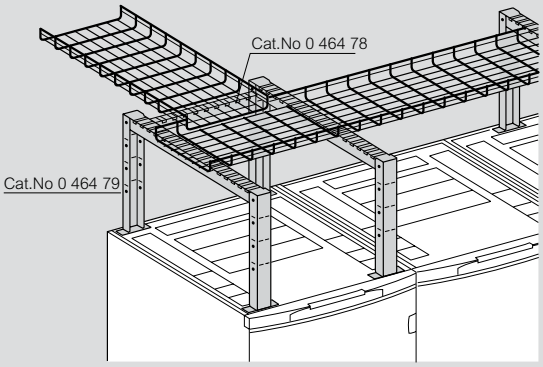


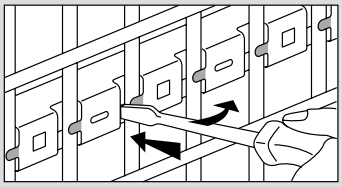



| Cat.Nos | Width x Depth | H(1) | | Usable area | | | | Distance (width x depth) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Min. | Max. | A | B | C | D | With cabinet | To the ground |
| 0 464 30 | 600 x 600 | 200 | 350 | 530 | 530 | 435 | 435 | 478 x 478 | 520 x 520 |
| 0 464 31 | 600 x 800 | | | | 730 | | 635 | 478 x 678 | 520 x 720 |
| 0 464 32 | 600 x 1000 | | | | 930 | | 835 | 478 x 878 | 520 x 920 |
| 0 464 33 | 800 x 600 | | | 730 | 530 | 635 | 435 | 678 x 478 | 720 x 520 |
| 0 464 34 | 800 x 800 | | | | 730 | | 635 | 678 x 678 | 720 x 720 |
| 0 464 35 | 800 x 1000 | | | | 930 | | 835 | 678 x 878 | 720 x 920 |

1: Adjustable in steps of 25 mm + fine tuning

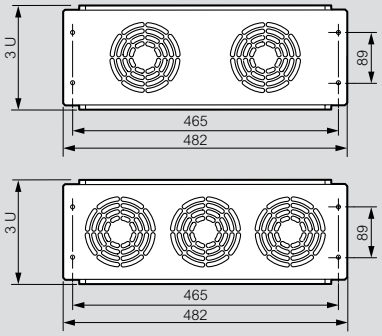
## Supports for cable guides on server cabinets



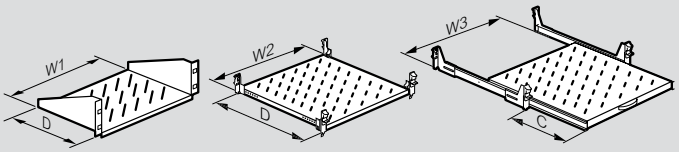
Cable guides can be installed quickly on the supports Cat.Nos 0 464 72/73/74/78/79

## 19" plates with fans (mm)




| Cat.Nos | Ventilation zone | |
|---|---|---|
| | Number of fans | Output (m³/h) |
| 0 464 87 | 2 | 180 |
| 0 464 88 | 3 | 270 |

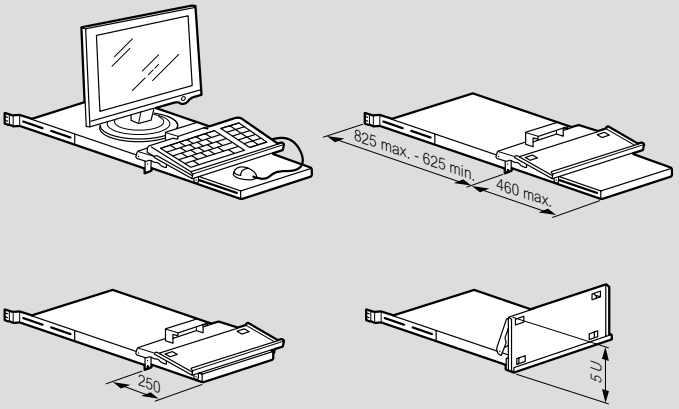
## Shelves (mm)



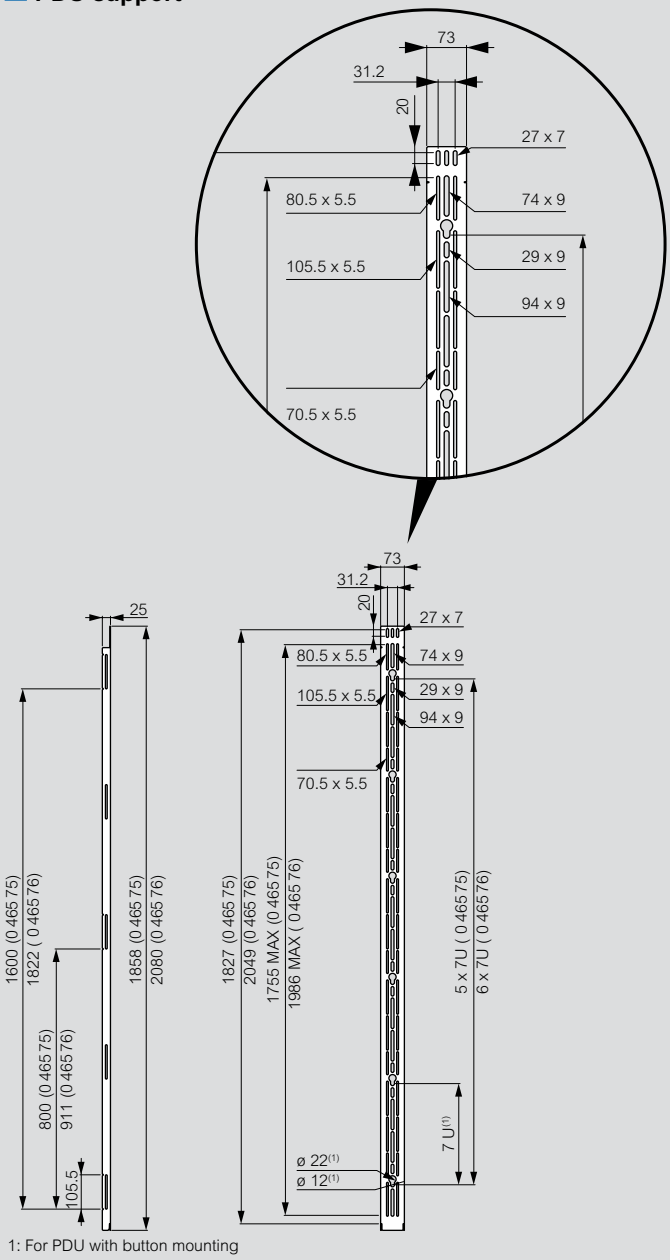

| Cat.Nos | D | Usable width | | | C |
|---|---|---|---|---|---|
| | | W1 | W2 | W3 | |
| 0 462 23(1) | 120 | 216 | | | |
| 0 465 00 | 115 | 435 | | | |
| 0 465 01 | 200 | 435 | | | |
| 0 465 02 | 360 | 435 | | | |
| 0 465 05 | 425 | | 440 | | |
| 0 465 06 | 625 | | 440 | | |
| 0 465 07 | 825 | | 440 | | |
| 0 465 08 | 425 | | | 425 | 320 |
| 0 465 09 | 625 | | | 425 | 420 |
| 0 465 10 | 625 | | | 425 | 420 |
| 0 465 17 | 820 | | 425 | | |
| 0 465 18 | 820 | | | 380 | 650 |

1: Fixing centre 236.5 mm

## Keyboard support shelf (mm)



## PDU support

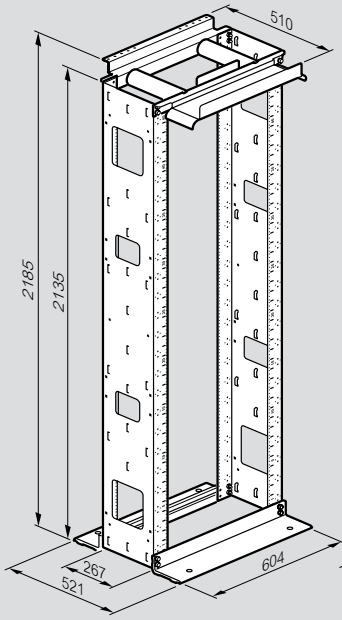



1: For PDU with button mounting

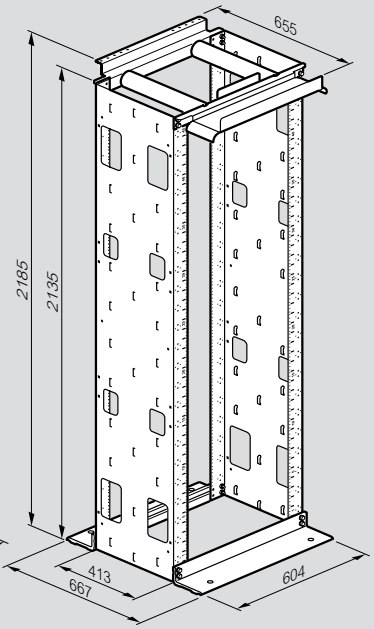
## 19" Racks

**Permissible load: 15 kg/U**

**0 464 06**

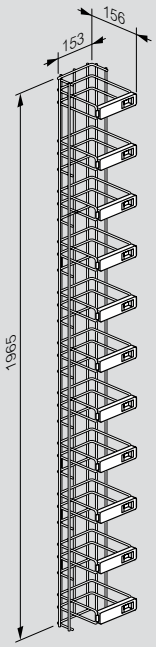



**0 464 07**

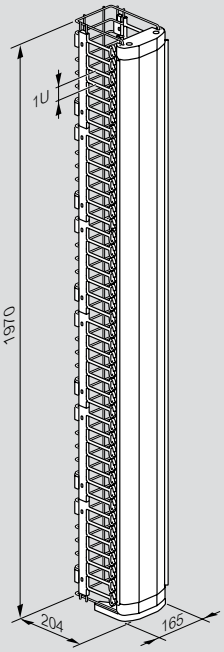



## Cord management grids

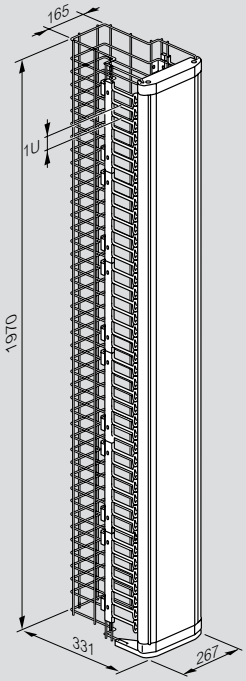
**0 464 25**




**0 464 26**



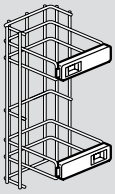

**0 464 27**

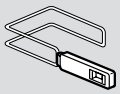


## 0 464 25

**Swing latch replacement installation**

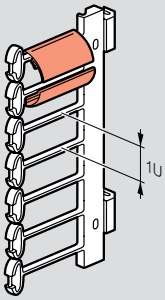
Installation can be either right or left hand swing out



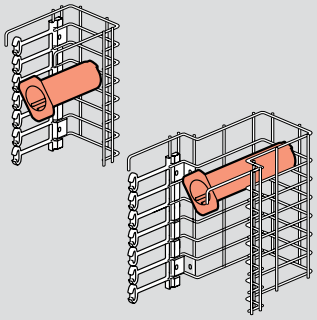


## 0 464 26/27

**Bend limiting clips**

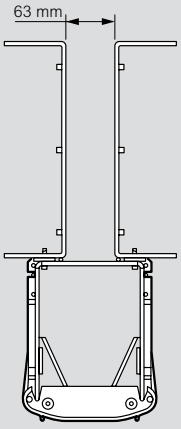



**Cord coiling support**

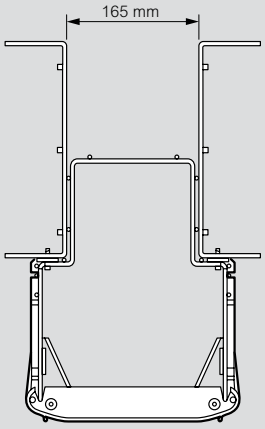


## Joining racks with grid

**0 464 25/26**

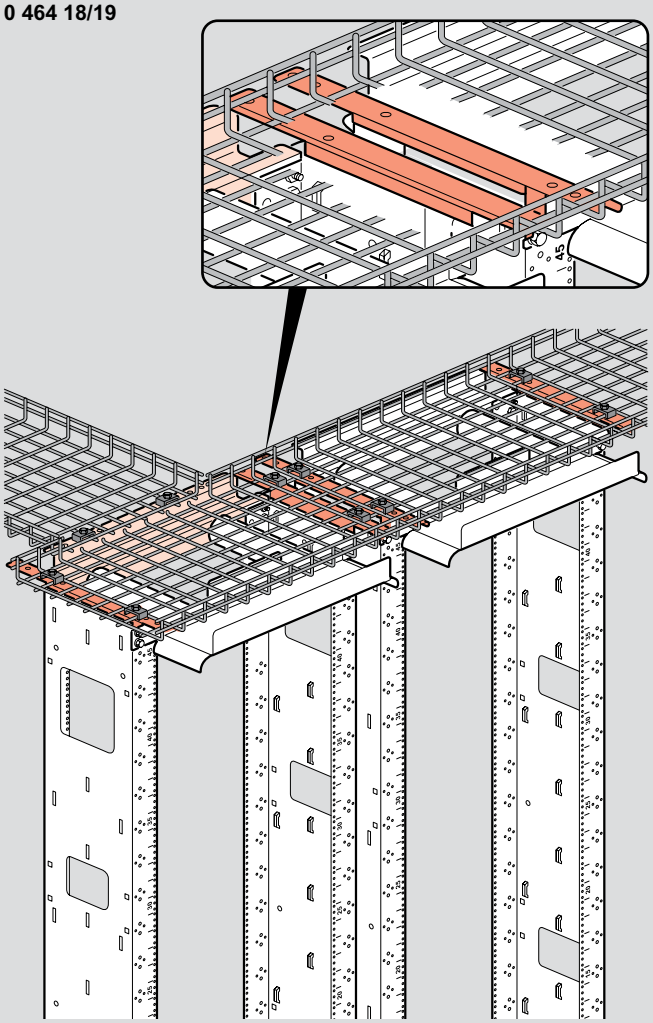



**0 464 27**



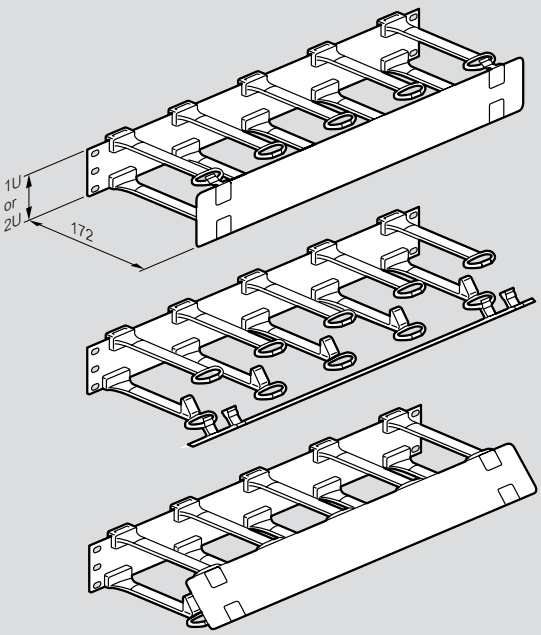

## Cable tray support

**0 464 18/19**



## 19" cord management panels

**0 465 70/71**



## General characteristics

Metallic wall-mounting cabinets
RAL 7016 textured polyester coating providing excellent resistance to corrosion and scratching
Front door made of safety glass
Protection index (weatherproof) against solid objects and liquids: IP 20
Protection index against mechanical impact: IK 08
Perforations in uprights: 9.5 x 9.5 mm
Permissible load: 3 kg/U (or 48 kg for a 19" cabinet 16 U)
12 kg for the 10" cabinet 6 U

## Compliance with standards

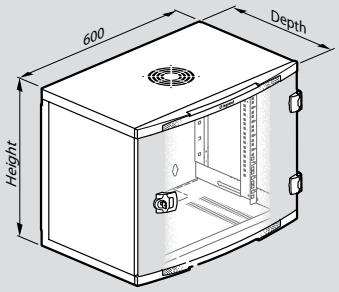
LCS² cabinets comply with the following standards:

| | |
|---|---|
| **IEC 60529 EN 60529** | (NF C 20-010) Degrees of protection provided by enclosures (IP code). |
| **IEC 62262 EN 62262** | (EN 50102, NF C 20-015) Degrees of protection provided by enclosures of electrical equipment against external mechanical impacts (IK code). |
| **IEC 60950-1 EN 60950-1 C 77-210-1** | Safety of data processing equipment. |
| **EIA-310-E** | Cabinets, enclosures, panels and associated equipment (ANSI/EIA/310-E-2005). |
| **IEC 60297-3-100 DIN 41414-7** | (NF C 20-150, NF C 20-151) Sizes of mechanical structures of the 482.6 mm (19 in) series |

LCS² cabinets can be integrated into installations complying with the following standards:

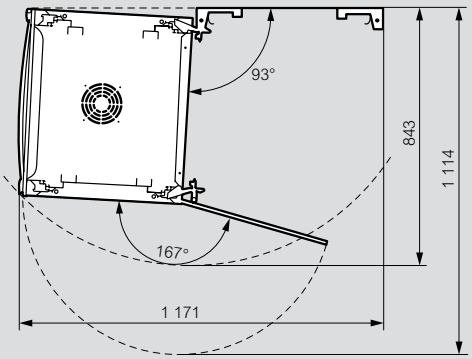
| | |
|---|---|
| **EN 50173-1** | Information technology - Generic cabling systems. |
| **EN 50174-1 and 2 C 90-480-1 and 2** | Information technology - Cabling installation. |
| **ISO IEC 11801** | Information technology - Generic cabling for customer premises |
| **NF C 15-100 Part 4-41** | Low voltage electrical installations - Recommendations. |
| **UTE C90-483** | Residential cabling for communication networks |
| **IEC 60364-4-41** | Low voltage electrical installations<br>- Protection for safety<br>- Protection against electric shock |

## Overall dimensions (mm)

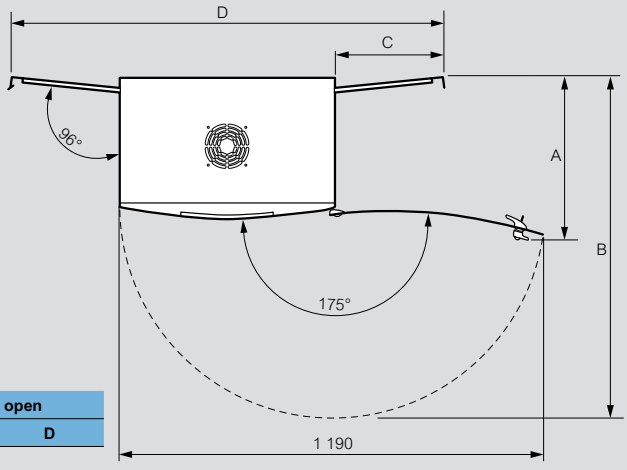



| | Cat.Nos | Capacity | Height | Width | Depth |
|---|---|---|---|---|---|
| **19" fixed cabinets** | 0 462 00 | 6 U | 350 | 600 | 400 |
| | 0 462 01 | 9 U | 500 | | |
| | 0 462 02 | 12 U | 600 | | |
| | 0 462 03 | 16 U | 800 | | |
| | 0 462 06 | 9 U | 500 | | 580 |
| | 0 462 07 | 12 U | 600 | | |
| | 0 462 08 | 16 U | 800 | | |
| | 0 462 09 | 21 U | 1000 | | |
| **19" pivoting cabinets** | 0 462 11 | 9 U | 500 | 600 | 615 |
| | 0 462 12 | 12 U | 600 | | |
| | 0 462 13 | 16 U | 800 | | |
| | 0 462 14 | 21 U | 1000 | | |
| **10" cabinet** | 0 462 20 | 6 U | 352 | 314 | 300 |

### Pivoting bottom opening

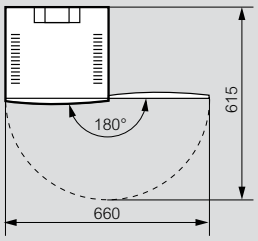



### Front door and side panel opening



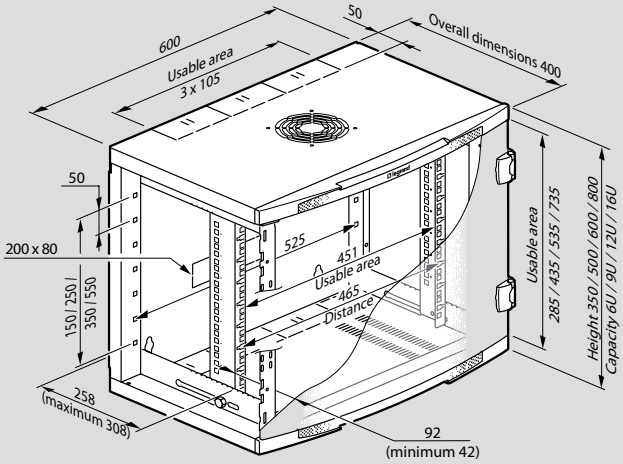

| | Cat.Nos | Doors open | | Panels open | |
|---|---|---|---|---|---|
| | | A | B | C | D |
| **19" fixed cabinets** | 0 462 00 | 400 | 962 | 305 | 1205 |
| | 0 462 01 | | | | |
| | 0 462 02 | | | | |
| | 0 462 03 | | | | |
| | 0 462 06 | 580 | 1140 | 482.5 | 1565 |
| | 0 462 07 | | | | |
| | 0 462 08 | | | | |
| | 0 462 09 | | | | |
| **19" pivoting cabinets** | 0 462 11 | 600 | 1179 | 482.5 | 1565 |
| | 0 462 12 | | | | |
| | 0 462 13 | | | | |
| | 0 462 14 | | | | |

### 10" cabinet door opening Cat.No 0 462 20

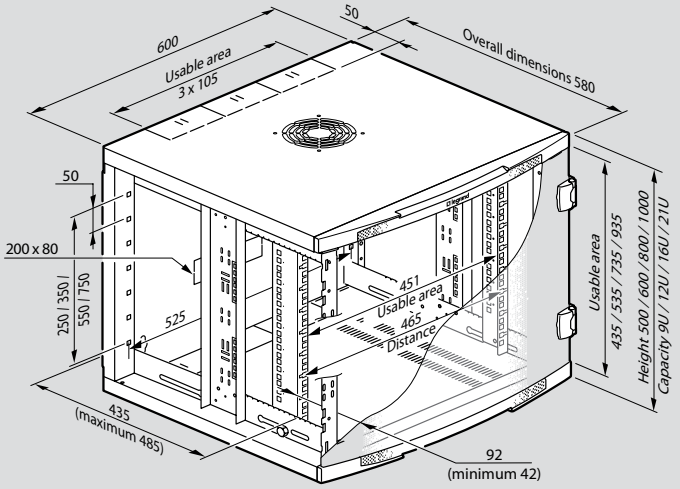


## Usable dimensions (mm)

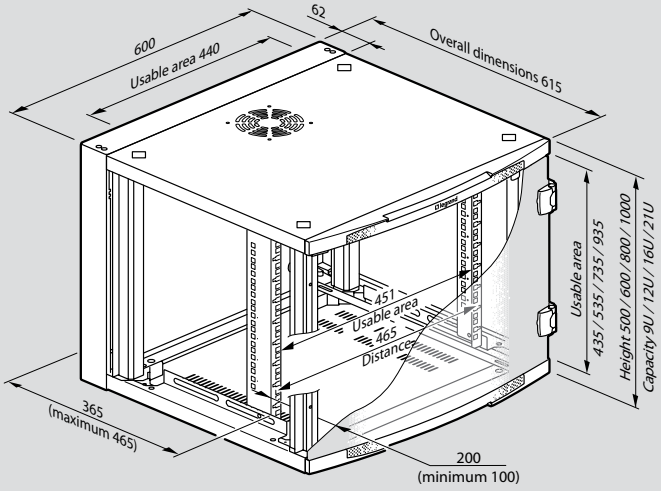
### 19" LCS² fixed cabinets depth 400 mm



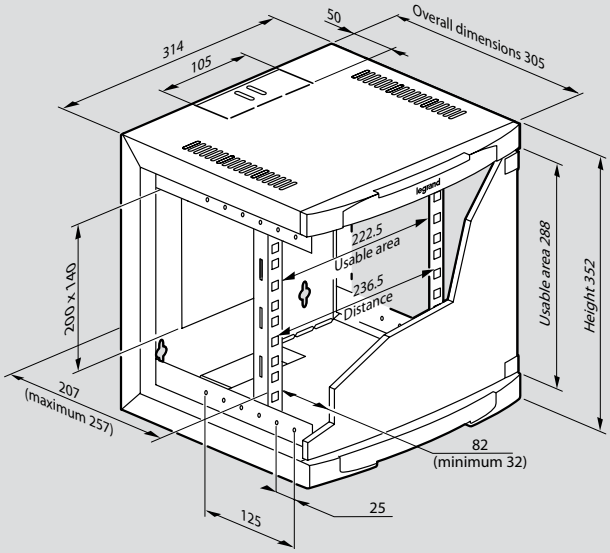

### 19" LCS² fixed cabinets depth 580 mm



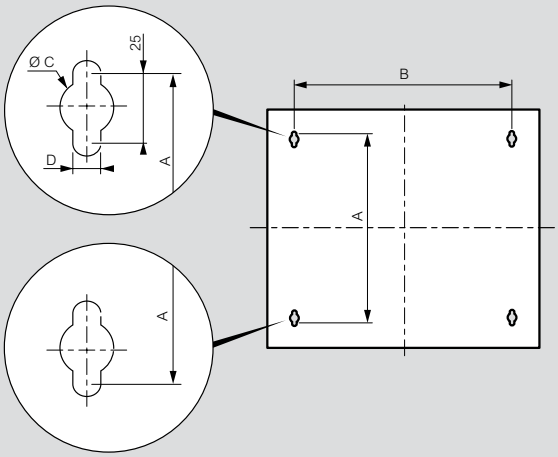

### 19" LCS² pivoting cabinets depth 600 mm




### 10" LCS² cabinet depth 300 mm




## Fixing of cabinets (mm)



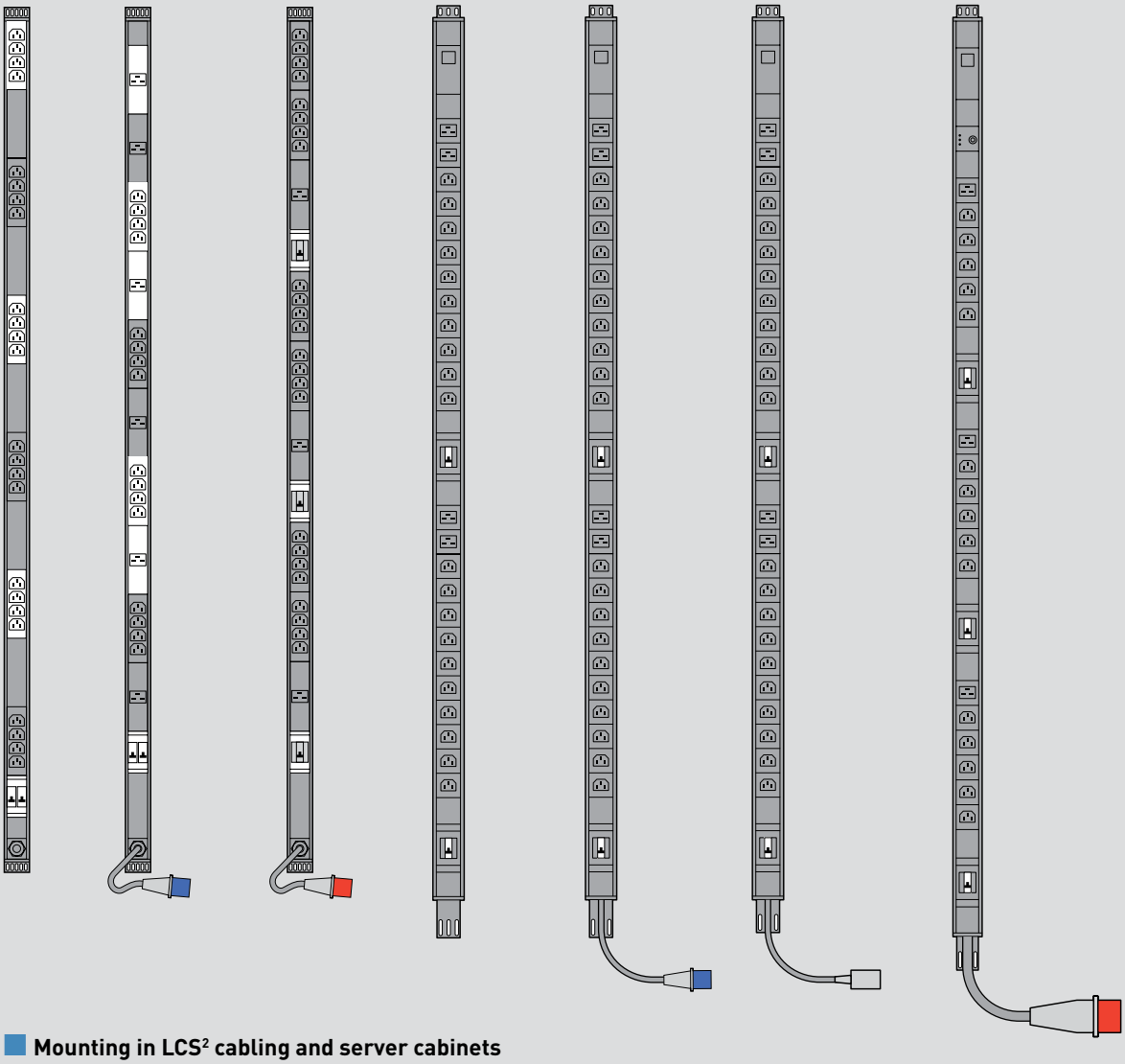

| | Capacity | A | B | C | D |
|---|---|---|---|---|---|
| 19" fixed cabinets | 6 U | 275 | 408 | 20 | 11 |
| | 9 U | 425 | | | |
| | 12 U | 525 | | | |
| | 16 U | 725 | | | |
| | 21 U | 925 | | | |
| 19" pivoting cabinets | 9 U | 425 | 500 | 18 | 9 |
| | 12 U | 525 | | | |
| | 16 U | 725 | | | |
| | 21 U | 925 | | | |
| 10" cabinets | 6 U | 275 | 250 | 15 | 6.5 |

## Weight (kg)

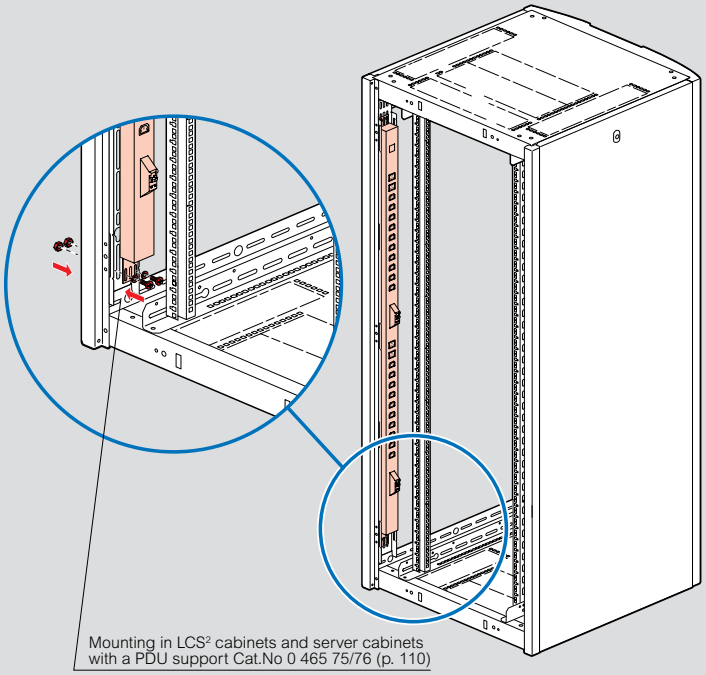
| | Cat.Nos | Weight |
|---|---|---|
| 19" fixed cabinets | 0 462 00 | 16.7 |
| | 0 462 01 | 20.4 |
| | 0 462 02 | 22.8 |
| | 0 462 03 | 26 |
| | 0 462 06 | 25.7 |
| | 0 462 07 | 32.7 |
| | 0 462 08 | 41.5 |
| | 0 462 09 | 52.5 |
| 19" pivoting cabinets | 0 462 11 | 31.8 |
| | 0 462 12 | 40 |
| | 0 462 13 | 47.3 |
| | 0 462 14 | 59 |
| 10" cabinet | 0 462 20 | 8 |

## Vertical Power Distribution Units configuration

0 465 81 0 465 84 0 465 85 0 465 93 0 465 94 0 465 95 0 465 96

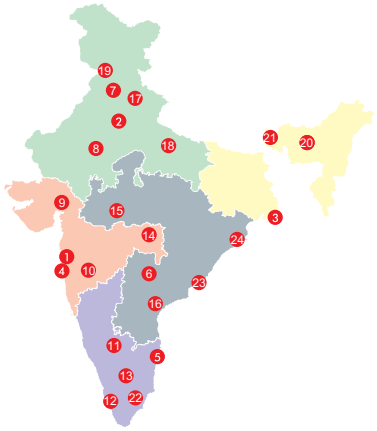


## Mounting in LCS² cabling and server cabinets



Mounting in LCS² cabinets and server cabinets with a PDU support Cat.No 0 465 75/76 (p. 110)

NOTES




## Head office

**1.** 61 & 62, 6th Floor,
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Website : www.legrand.co.in

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Fax : (011) 2699 0047

**3.** Bhakta Towers, 2nd & 3rd Floor,
Plot No. KB 22, Salt Lake, Sector - 3,
**KOLKATA** – 700 098.
Tel : (033) 4021 3535 / 36
Fax : (033) 4021 3537

**4.** C/203, Corporate Avenue, Atul Projects,
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Andheri Ghatkopar Link Road,
Andheri – East, **MUMBAI** – 400 099.
Tel : (022) 3385 6200

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Office Block Vijaya Forum Mall, 183,
N.S.K. Salai, Vadapalani
**CHENNAI** – 600 026.
Tel : (044) 3024 7200

**6.** 205-208, 2nd Floor,
Block - II, White House,
Kundan Bagh, Begumpet,
**HYDERABAD** – 500 016.
Tel : (040) 2341 4398 / 67, 4567 1717
Fax : (040) 6636 6974

## Branch offices

**7.** SCO 1-2-3,
Second Floor, Sector 17B,
**CHANDIGARH** – 160 017.
Tel : (0172) 305 8631 / 32 / 33 / 34 / 35
Fax : (0172) 501 9008

**8.** 507-510, Vth Floor, Soni Paris Point,
Jai Singh Highway, Banipark,
**JAIPUR** – 302 016.
Telefax : (0141) 511 3129

**9.** 504, Sakar IV,
Opp. M. J. Library, Ellis Bridge,
**AHMEDABAD** – 380 006. Gujarat
Tel : (079) 2658 6561 / 2
Fax : (079) 2658 6563

**10.** 402, Swastik Chambers,
Near Ashwamegh Marriage Hall,
Behind HP Petrol Pump,
Off Karve Road, Erandwane,
**PUNE** – 411 004.
Tel : (020) 6729 5600 / 601
Fax : (020) 6729 5604

**11.** IInd Floor, Al-Latheef Building,
2/1, Union Street, Off. Infantry Road,
**BANGALORE** – 560 001.
Tel : (080) 2286 1081, 4113 3293 / 4
Fax : (080) 2286 1078

**12.** J. B. Manjooran Estate,
Door No 50/1107A9, 3rd Floor,
Bye Pass Junction, Edappally,
**COCHIN** – 682 024.
Tel: 0484 2801921, 2802921, 6580921
Fax: 0484 2801921, 2802921

**13.** B-5, 1st Floor, Thirumalai Towers,
723, Avanashi Road,
(Opp to hotel Residency),
**COIMBATORE** – 641 018.
Tel : 0422 2220283 / 2223634
Fax : 0422 2223164

**14.** Plot No.95, II Floor, Shreyash Heights,
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Tel : (0712) 662 7857 / 58
Fax : (0712) 662 7859

**15.** 204-205, Megapolis Square,
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Fax : (0731) 393 1653

**16.** MF-2, Datta's Lords House,
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**VIJAYAWADA** – 520 010.
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Fax : (0866) 669 9393

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**18.** Cabin No.104/105,
Trade Point,
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Saran Chamber 1,
5, Park Road, Hazratganj,
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Tel : (0522) 223 9044 / 7285
Fax : (0522) 223 9124

**19.** Cabin No. 9,
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Madhok Trade Centre,
Madhok Complex,
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**20.** House No. 97,
Ground Floor,
Rajgarh Main Road,
Opp. City Heart Nursing Home,
**GUWAHATI** – 781 007.
Tel : (0361) 245 8498

**21.** 94, Udham Singh Sarani,
Ground Floor, Ashrampara,
**SILIGURI** – 734 001.
Tel : 94341 91635 / 98009 77780

**22.** Aparna Towers, 1st Floor,
2/3, Bypass Road,
**MADURAI** – 625 010.
Telefax : (0452) 230 8414

**23.** 404, Eshwar Plaza,
Dwaraka Nagar, Main Road,
**VISHAKHAPATNAM** – 530 016.
Tel : (0891) 663 5652
Fax : (0891) 663 9363

**24.** Plot No. 359,
Saheed Nagar, 2nd Floor,
**BHUBANESWAR** – 751 007.
Tel : (0674) 254 0623

CIN U31909MH2010PTC206487

LCS²/2000/10/2016

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**customer.care@legrand.co.in**

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