LCS^3

3 DIMENSIONS OF EXCELLENCE

PERFORMANCE • SCALABILITY • EFFICIENCY

DATA CENTER
LOCAL AREA NETWORK

THE GLOBAL SPECIALIST
IN ELECTRICAL AND DIGITAL BUILDING INFRASTRUCTURES

legrand®

LCS³

3 DIMENSIONS
OF EXCELLENCE

PERFORMANCE • SCALABILITY • EFFICIENCY

Legrand Group

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4 **Your multi-specialist partner for all your IT networks**

6 **An extensive expertise in digital infrastructures**

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LEGRAND
GROUP

A global player

As the global specialist in electrical and digital building infrastructures, Legrand offers a comprehensive range of solutions and services tailored to numerous applications.

IMPROVING LIVES BY TRANSFORMING SPACES, THE ESSENCE OF OUR PURPOSE

The Group's mission is to improve lives by transforming the spaces where people live, work and meet, with electrical and digital infrastructures and connected solutions that are simple, innovative and sustainable.

#LegrandImprovingLives

Transforming spaces where people live, from individual and collective housing to hotels and more.

Transforming spaces where people work, including data centers, offices and industrial sites.

Transforming spaces where people meet, from housing to shops, hospitals, schools, universities and more.

THE LEGRAND GROUP IN A NUTSHELL

SALES IN CLOSE TO **180** COUNTRIES

AN ACTIVE INTERNATIONAL PRESENCE ESTABLISHED IN OVER **90** COUNTRIES

5% OF TOTAL BUDGET USED IN R&D

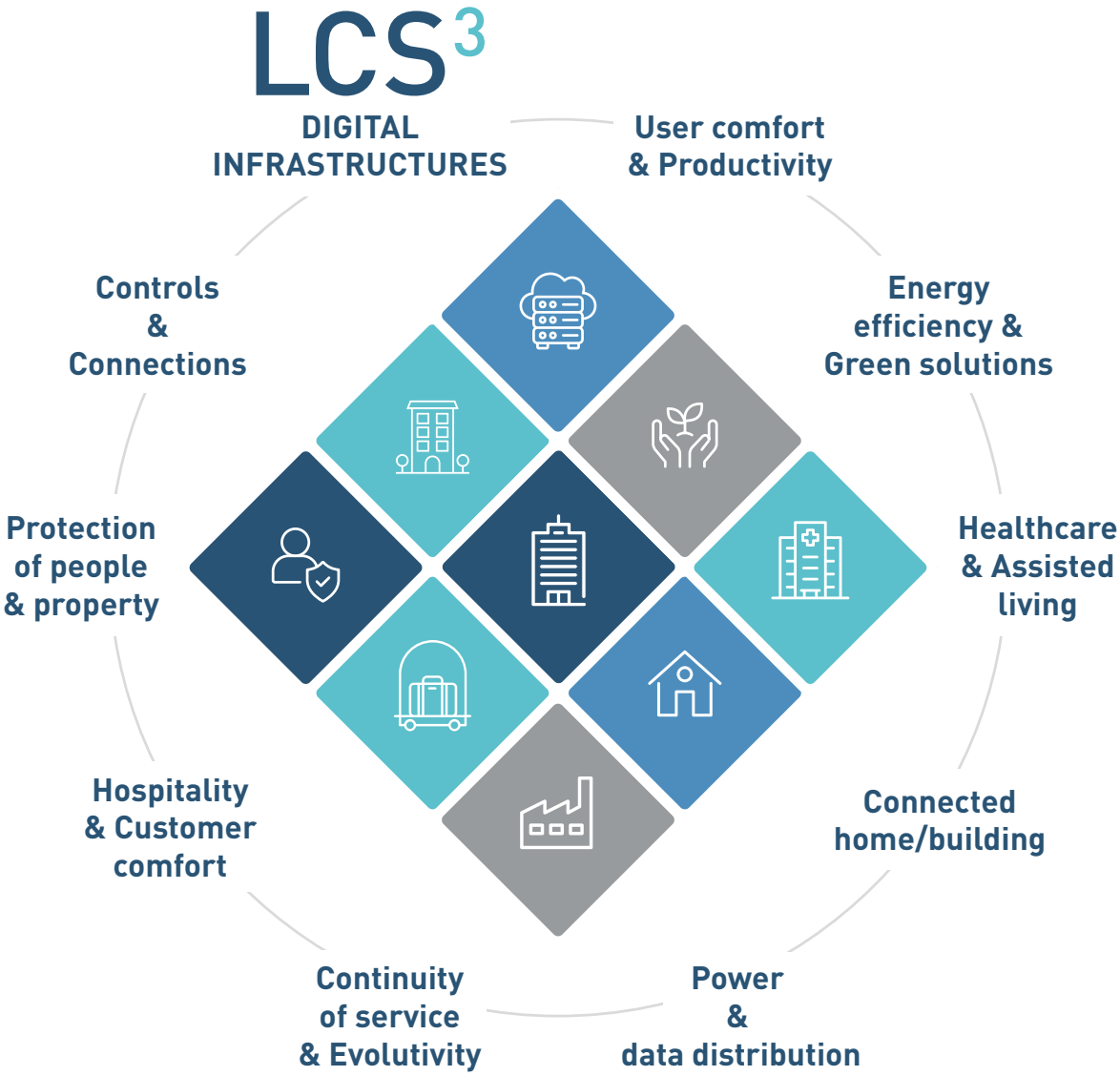
€6,994 MILLIONS IN TOTAL SALES IN 2021

OVER **36,700** EMPLOYEES WORLDWIDE

EXPERTISE AND COMMITMENTS, OUR MEANS TO ACHIEVE IT

The scope of its offering, its technological expertise, its leading positions, its international presence and the power of its brands combine to make Legrand a worldwide benchmark.
The meaning and values the Group's purpose statement conveys are integral to the development of each product and solution, and to each decision at Legrand. They also underpin the commitments the Group makes to its customers, to its employees, to its partners and to society as a whole.

By covering all needs, including emerging ones shaped by changing lifestyles and working habits, the Group's comprehensive, innovative and high-performance portfolio of solutions provides answers to the technological, societal and environmental challenges that we all face every day.

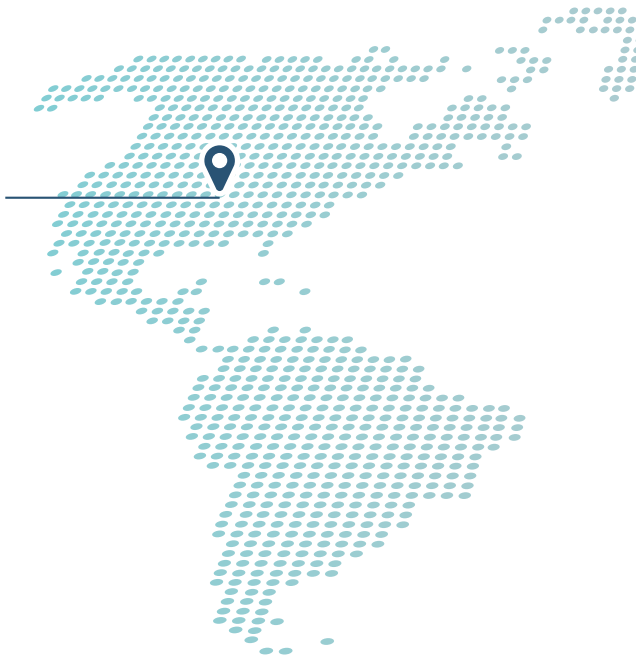


LEGRAND
GROUP

Your multi-specialist partner for all your IT networks

Its investment in the development and design of structured cabling systems and solutions has enabled the Legrand group to expand its offer and achieve the highest level of performance. Legrand cabling systems currently provide high-quality connectivity to more than 200 million devices, making the Legrand group a world leader in communication networks for data transmission.

A PORTFOLIO OF SPECIALIST BRANDS



- **AFCO systems** (USA)
  An industry leader in the design, engineering and manufacture of racks, cabinets, enclosures, and air containment systems.
- **C2G** (USA)
  An industry leader in end-to-end connectivity solutions serving commercial applications in a variety of markets.
- **Electrorack** (USA)
  A leading manufacturer of enclosures, cabinets, power and cooling for commercial data communications applications.
- **Luxul** (USA)
  The leading innovator of simple-to-deploy professional grade IP networking solutions for use by custom installation professionals.
- **Middle Atlantic Products** (USA)
  A manufacturer of exceptional support and protection products to mount integrated AV systems in residential, commercial, broadcast, and security applications.
- **Milestone AV Technologies LLC** (USA)
  A frontrunner in Audio Video (AV) infrastructure and power with strong leading positions in high-value segments.
- **Server Technology** (USA)
  A leading provider of customer-driven and innovative power/access/control solutions for monitoring and managing critical IT assets for continual availability.
- **Starline** (USA)
  A worldwide provider of electrical power solutions for the data center, retail, healthcare, higher education and industrial markets.

- **Raritan** (USA)
  A leading provider of intelligent rack PDUs, transforming how companies manage their data center power chains. The solutions increase the reliability and intelligence of data centers.

- **Legrand** (France)
  A global leader in network infrastructure solutions, especially with a broad range of copper and fiber connectivity, based on decades of experience. The Legrand product line features flexible, efficient solutions, united by superior design, to ensure that your data center or building network operates flawlessly.

- **Minkels** (Netherlands)
  A knowledge-driven producer and worldwide supplier of high-quality solutions for data center infrastructure, including racks and containment solutions.

- **Clever** (China)
  A leading Power Distribution Units, network power management, and related power distribution solution provider.

- **Valrack** (India)
  A manufacturer of cabinets providing vital customized support for telecom, wind power, railways, pharma, power industries.

- **Compose** (Netherlands)
  A specialist for passive data communication solutions, relating to the cabling of data centers, buildings and fiber optic infrastructures (FTTx).

- **Geiger** (Germany)
  With its 25-year success story, Geiger is able to provide customer value in the field of scalable and highly available communication and data center infrastructure from the idea to the implementation.

- **Modulan** (Germany)
  A provider of custom cabinets for data centers.

- **Estap** (Turkey)
  A manufacturer of enclosures and cabinets for data communication equipment.

- **SJ Manufacturing** (Singapore)
  A data center specialist on racks, containment and caging now promoted under Legrand brand.

- **Trical** (New Zealand)
  A front-runner in electrical and digital enclosures and switchboards for residential and commercial buildings.

LEGRAND
GROUP

An extensive expertise in digital infrastructures

Legrand's complete global solutions for data communication perfectly address the key challenges for digital networks: network performance, protection and accessibility of every infrastructure. Our LCS³ system offers copper and fiber global solutions for structured cabling both in data center and LAN.

LOCAL AREA NETWORKS

SOLUTIONS FOR STRUCTURED CABLING

- **Housing solutions**
  (19" freestanding and wall-mounting cabinets, open racks, PDUs, micro data centers, etc.)
- **Copper solutions**
  (RJ45 connectors, patch panels, cables and patch cords, PoE switches, etc.)
- **Fiber solutions**
  (Connectors, equipped & modular panels, bend-insensitive cables, etc.)

DATA CENTER & SERVER ROOM

SOLUTIONS FOR STRUCTURED CABLING IN SERVER ROOMS

- **Housing solutions**
  (Server cabinets, aisle containment, cooling units and cold corridor, open racks, PDUs, etc.)
- **Copper solutions**
  (Preterminated, etc.)
- **Fiber solutions**
  (Preterminated, intelligent patching, high-density fiber optic solutions, etc.)

LCS³

AUDIO VIDEO SYSTEM

A WIDE RANGE OF TECHNOLOGIES TO SUIT THE LOCATION AND THE USER EQUIPMENT

- **Racks and enclosures**
- **Preterminated audio/video sockets** (HDMI, display port, USB, RCA, JACK, etc.)
- **Cords and adaptors**

A GLOBAL OFFER REACHING ALL DIMENSIONS OF EXCELLENCE:

- Performance
- Scalability & Maintenance
- Efficiency
- Astuteness
- Flexibility
- Reliability & Safety

LCS³

A GLOBAL OFFER

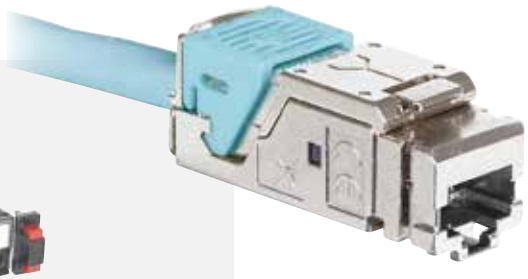
Cabling system: Performance

Legrand's LCS³ system offers you a complete range of copper solutions as well as fiber optic solutions designed to deliver advanced network performance:

- 25 Gbps and 40 Gbps Ethernet applications (Copper system)
- 40 Gbps, 100 Gbps and 400 Gbps Ethernet applications (Fiber optic system)
- MTP/MPO high density and up to Cat. 8 solutions (Copper and Fiber optic systems)

COPPER SYSTEM

▸ CAT. 8 TRANSMISSION **UP TO 40 GBPS**



Cable & connector compliant with ISO/IEC 11801 standards

Cat. 8 toolless connector: up to 2500 connection/disconnection cycles

FIBER OPTIC SYSTEM

▸ MTP/MPO SOLUTION TRANSMISSION **UP TO 400 GBPS**

High density connection with 12 or 24 fibers compliant with IEEE 802.3ba.

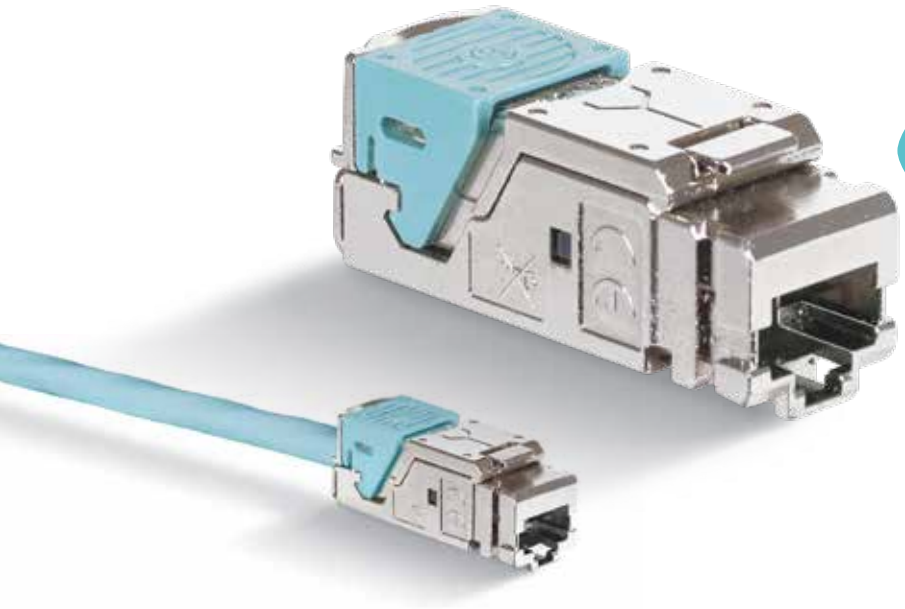
MPO/MTP fiber optic drawers. Up to 96 LC on 1U. Available in 1U, 2U and 4U.

COPPER SYSTEM OPTIMUM PERFORMANCE WITH CAT. 8

CAT.8 CONNECTORS

The toolless Cat. 8 STP connectors with transmission speed (bit rate) from 25 Gbps to 40 Gbps, are integral to the performance of the LCS³ system.

- In accordance with ISO/IEC 11801 series standards
- Tested up to 2500 connection/disconnection cycles
- A perfect connection in just a few seconds



CONNECTION & CABLING

To maximize performance, combine the Legrand Cat. 8 connector together with the Legrand Cat. 8 cable supporting up to 40 Gbps over a single cable.

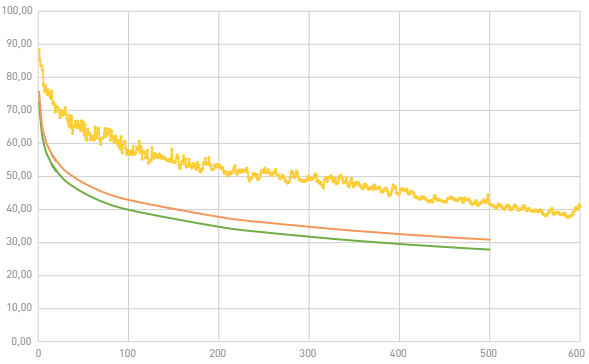
The Cat. 8 cable is terminated with an improved dedicated RJ45 connector which can support future performance.
The performance is 4 times better than that of a Cat. 6A cable with up to 2000 MHz bandwidth.

- Double screening to avoid interference and loss of data
- Dedicated to higher capacity in data centers and equipment rooms
- Compliant with ISO/IEC 11801 series standards

Legrand guarantees the following performance on end-to-end links of Cat. 6A/Class EA:
3dB margin on Channels, on Return Loss (RL) and Near End Cross Talk (NEXT) performance, for the complete frequency range, based on ISO/IEC limits.

- No marginal results (shown with Asterisk on test results) on Permanent Links
- Valid on standard compliant 2 connectors channels

NEXT



Standard limit — LCS³ Guarantee — LCS³ Typical NEXT

RETURN LOSS

Standard limit — LCS³ Guarantee — LCS³ Typical RL

APPLICATIONS DISTANCES ACCORDING TO CATEGORY OF CABLING

Application \ Frequency[1]	LCS³ Cat.5e 100MHz	LCS³ Cat.6 250MHz	LCS³ Cat.6A 500Mhz	LCS³ Cat.8 2000MHz
1000Base-T	100m	100m	100m	100m
2.5Gbase-T	Possible[2]	Possible[2]	100m	100m
5Gbase-T	Possible[2]	Possible[2]	100m	100m
10Gbase-T	N/A[4]	Possible[3]	100m	100m
25Gbase-T	N/A[4]	N/A[4]	Possible[5]	30m
40Gbase-T	N/A[4]	N/A[4]	Possible[5]	30m

[1] Maximum frequency defined in the standards

[2] Follow ISO/IEC TR 11801-9904 or TIA TSB 5021 to evaluate possibility on installed links. Distance will depend on many factors.

[3] Follow ISO/IEC TR 24750 or TIA TSB 155-A to evaluate possibility on installed links. Distance will depend on many factors.

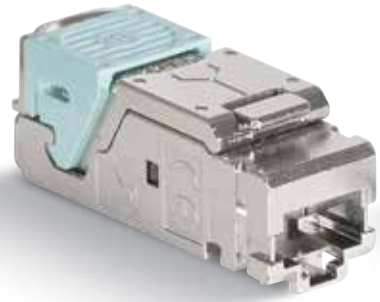
[4] Not Available.

[5] Follow ISO/IEC TR 11801-9905 to evaluate possibility on installed links. Distance will depend on many factors.

COPPER SYSTEM
PoE CERTIFICATION

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

The LCS³ connectors are PoE++ Third Party certified.



PoE++ Third Party certified

TABLE OF PoE TYPES ACCORDING TO CABLING REQUIREMENTS AND POWER AVAILABILITY

Name (Common name)	Type 1 (PoE)	Type 2 (PoE+)	Type 3 (PoE++)	Type 4 (PoE++)
IEEE Standard	802.3af (2003)	802.3at (2009)	802.3bt (2018)	802.3bt (2018)
Minimum Category Required	Category 3	Category 5e	Category 5e	Category 5e
Number of Pairs for Power	2	2	2 or 4	4
Maximum Current per Pair	350 mA	600 mA	600 mA	960 mA
Guaranteed maximum Power at PSE Output	15.4 W	30.0 W	60.0 W	90.0 W
Guaranteed maximum Power at PE Input	13 W	25.5 W	51.0 W	71.3 W
Diagram with maximum current per wire (mA)	175 175 175 175	300 300 300 300	300 300 300 300 300 300 300 300	480 480 480 480 480 480 480 480

Pair with outgoing current | Pair with returning current | Pair without current

There are subdivisions of PoE called Classes. Below is a table of these Classes with correspondence to the PoE Types and the power available. It's important to note that the difference of power between the PD and the PSE does not represent an average efficiency, but only a worst case with maximum distance and highest resistance cabling.

Class	1	2	3	4	5	6	7	8
Type	Type 1			Type 2	Type 3[1]		Type 4[2]	
PSE maximum output average power (W)	4	7	15.4	30	45	60	75	90
PD Input Average Power (W)	3.8	6.5	13.0	25.5	40.0	51.0	62.0	71.3
PD Peak operating Power (P)	5.0	8.4	14.4	28.3	42.0	53.5	65.1	74.9

Notes: [1] Type 3 can also support Classes 1 to 4. [2] Only single signature PD shown

COMMITMENTS ON PoE

Legrand solutions are complying as per below:

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

Confident in the design and quality of our solutions, we overperform and guarantee the full 90m Permanent Link* under PoE maximum power of 90W for shielded LCS³ systems. Our PoE guide provides clear installation conditions and allows Legrand to give a 25-year warranty on applications including PoE.

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

QUALITY & PROTECTION

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

WANT TO KNOW MORE ABOUT PoE AND INCREASE THE POWER OF YOUR NETWORK?

CONTACT YOUR LOCAL SALES REP TO GET OUR PoE INSTALLATION GUIDES!

FIBER OPTIC SYSTEM LEGRAND'S MTP SYSTEM

HIGH-SPEED SOLUTION

With data centers, increased data rates have become priority requirement. The IEEE has introduced parallel optics as an alternative to higher bandwidth fiber, starting with 40Gbps and now reaching 800Gbps Ethernet.
To answer this need Legrand has introduced the MTP (Multiple-Fiber Push-On/Pull-Off compatible MPO) fiber solution to the catalogue. It guarantees speed, resistance, high performance and high density.

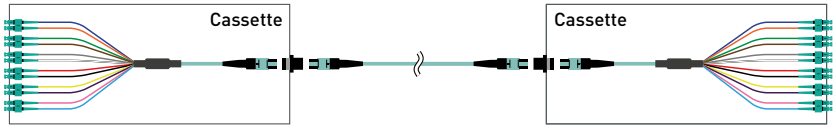
40/100/400 GIGABIT ETHERNET CONNECTIVITY AND CABLE

Identified by IEEE, TIA and ISO/IEC as the solution for non-duplex applications. The term MPO is the generic name while the term MTP is a specific higher performance version with lower insertion loss.

MTP connector features:

- a high-speed connection with 12 fibers (2x12 for 24 fibers and with cassettes 8 fibers compatible)
- precise and safe connection
- optimized cable management
- high-density fibers
- scalable system for future upgrades
- simple maintenance operations
- ease of extraction. No complex installation on site - plug and play
- the MTP is a multi-core connector. 1 cable = 1 connector

WITH STANDARD ACTIVE EQUIPMENT, WE NEED TO CONVERT THE MTP TO LC OR SC



OPTICAL PERFORMANCE

MTP® connectors	Multimode Ultra Performance*	Single-mode Ultra Performance*
IL/Master	0.1 dB typical (all fibers) 0.35 dB maximum (single fiber) [2] [3]	0.1 dB typical (all fibers) 0.35 dB maximum (single fiber) [1] [4]
IL Max/Random*	0.35 dB (single fiber)	0.35 dB (single fiber)
Optical return loss[5]	> 20 dB	> 60 dB (8° angle-polished)

[1] As tested in accordance with ANSI/TIA-455-171 Method D3 / IEC 61300-3-4
[2] As tested in accordance with ANSI/TIA-455-171 Method D1 / IEC 61300-3-4
[3] As tested on 50µm fibers at a wavelength of 850 nm in accordance with IEC 61280-4-1
[4] Complies with IEC 61755-3-31/GRADE B
[5] As tested in accordance with IEC 61300-3-6 and ANSI/TIA-455-107A

* Performance is guaranteed only with other components of the same Legrand range (Core, Ultra and Quantum). Mixing ranges or use of components of other brand may lead to a different performance of the system. The uncertainty value for field measurement with LSPM testing using a reference cord defined in ISO/IEC 14763-3 applies to field testing with proposed Legrand testing cords. Refer to the Fiber Optic Testing Guide for Legrand Solutions.

LC, SC, LC APC, SC APC connectors	Multimode Ultra Performance*	Single-mode Ultra Performance*
IL Max/Master*	0.15 dB	0.15 dB
IL Max/Random *****	0.2 dB	0.25 dB
Typ. IL/Master*	0.08 dB	0.12 dB
Typ. IL/Random *****	0.10 dB	0.12 dB
Return loss (UPC/APC)	> 25 dB	> 55/65 dB

* IEC 61300-3-4

** IEC 61300-3-34

*** Performance is guaranteed only with other components of the same Legrand range (Core, Ultra and Quantum). Mixing ranges or use of components of other brand may lead to a different performance of the system. The uncertainty value for field measurement with LSPM testing using a reference cord defined in ISO/IEC 14763-3 applies to field testing with proposed Legrand testing cords. Refer to the Fiber Optic Testing Guide for Legrand Solutions.

COMMON DATA CENTER APPROACHES

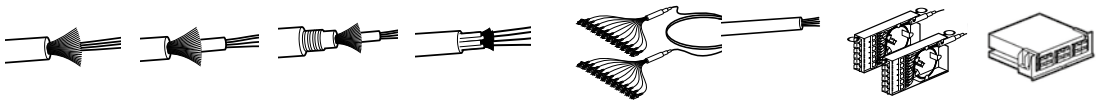
Multimode fiber systems have been the most cost-effective fiber solution to use in the data center because the transceivers are much less costly than single-mode transceivers. Multimode transceivers use a vertical cavity surface emitting laser (VCSEL) light source, which is easy to manufacture and package. Multimode fiber systems have a shorter reach than single-mode systems, however surveys have shown that more than 80% of data centers links extend to 100m or less. Although single-mode cable is less expensive, after factoring in the total system cost of multimode versus single-mode, multimode is still far more cost efficient.

MAXIMUM DATA RATE ACCORDING TO FIBER TYPE AND NUMBER OF CORES USED

	OM3	OM4	OM5	OS1a	OS2
2-core	1Gbps: 550m 10Gbps: 300m 25Gbps: 70m 50Gbps: 70m	1Gbps: 550m 10Gbps: 400m 25Gbps: 100m 50Gbps: 100m 100Gbps: 100m	1Gbps: 550m 10Gbps: 400m 25Gbps: 100m 50Gbps: 100m 100Gbps: 100m	1Gbps to 400Gbps: 2km	1Gbps: 5km 10Gbps to 400Gbps: 10km
4-core	100Gbps: 70m	100Gbps: 100m 200Gbps: 100m	100Gbps: 100m 200Gbps: 100m	100Gbps: 500m	100Gbps: 500m
8-core	40Gbps: 100m 100Gbps: 70m 200Gbps: 70m 400Gbps: 100m	40Gbps: 150m 100Gbps: 100m 200Gbps: 100m 400Gbps: 100m	40Gbps: 150m 100Gbps: 100m 200Gbps: 100m 400Gbps: 150m	200Gbps: 500m 400Gbps: 500m 800Gbps: 500m	200Gbps: 500m 400Gbps: 500m 800Gbps: 2km
16-core	400Gbps: 100m 800Gbps: 70m	400Gbps: 100m 800Gbps: 100m	400Gbps: 100m 800Gbps: 100m	800Gbps: 100m 1.6Tbps: 500m	800Gbps: 2km 1.6Tbps: 2km

Data in orange: draft applications (distances may vary at time of publication)

HIGH PERFORMANCE ON ALL STANDARD AND ON-DEMAND PRETERMINATED SYSTEMS

Connectivity	TYPES
Trunks	Tight buffer · Loose tube · Loose tube corrugated steel tape · Break-out · Fan-out · Micro-cable 250 microns · Cassette · Cassette Fan-out  **TYPE OF FIBER** OS1/OS2, OM1, OM2, OM3, OM4, OM5, etc. · **NUMBER OF FIBERS** 2, 4, 6, 8, 12, 16, 24, On demand, etc. · **CHOICE OF TERMINATION** LC, SC, SC APC, MTP etc. · **PLEASE CONTACT US** for any specific requirements.
Cabling	**High density (HD)**
Panels & cassettes Splice panel	**MTP to LC or SC. Cassette to cassette without MTP** 
Cables/Patch cords	OM2, OM3, OM4, OM5 & OS2 Microcable loose tube

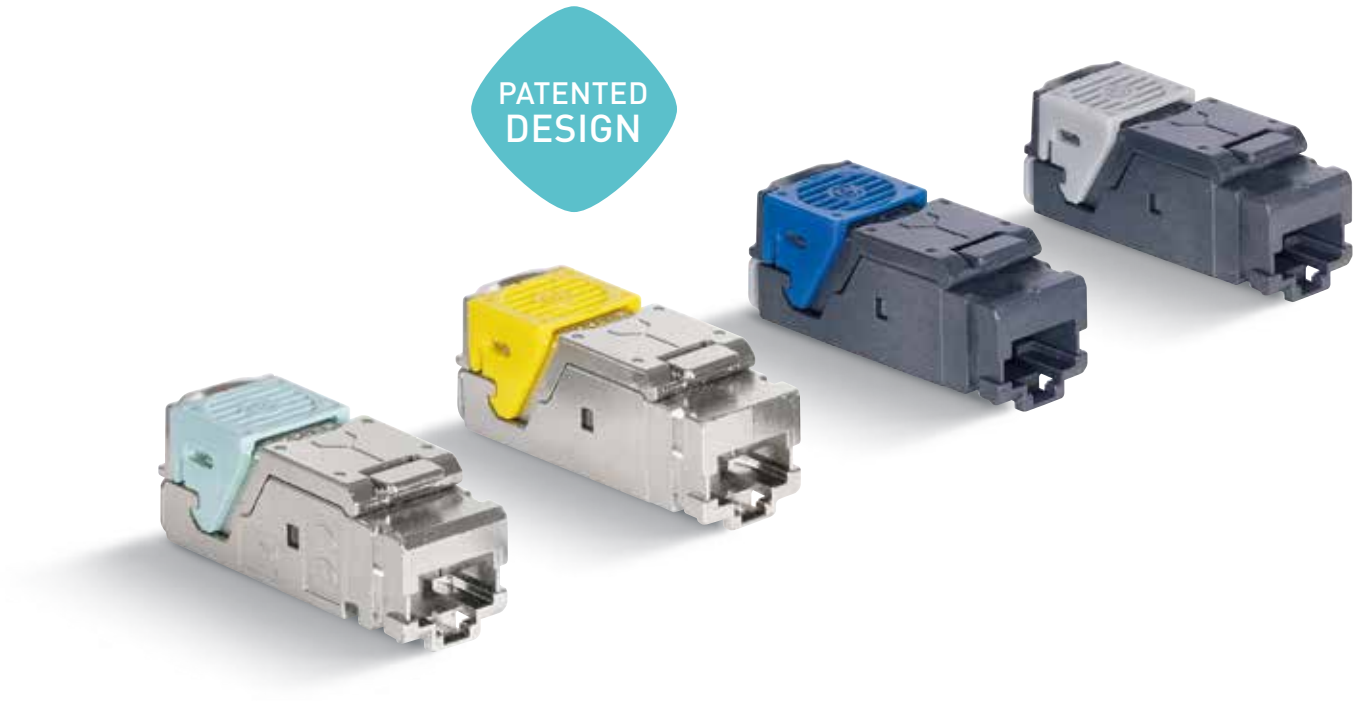
LCS³

A GLOBAL OFFER

Cabling system

Scalability & Maintenance

Legrand's LCS³ range offers you innovative systems to facilitate wiring and installation, while offering increased data rates with both the copper solution and the fiber optic solution.



COPPER SYSTEM RJ45 CONNECTORS

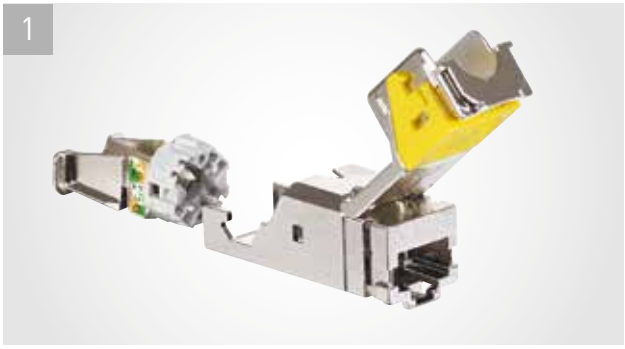
The **TOOLLESS CONNECTORS** with toolless fast connection are available in all categories for installation both on patch panels and in the workstation. A perfect connection can be obtained in a few seconds, guaranteeing optimum performance of the link from the patch panel to the workstation.

The toolless connectors are colour-coded so their category can be safely identified:

- Cat. 8: aqua
- Cat. 6A: yellow
- Cat. 6: blue
- Cat. 5e: grey

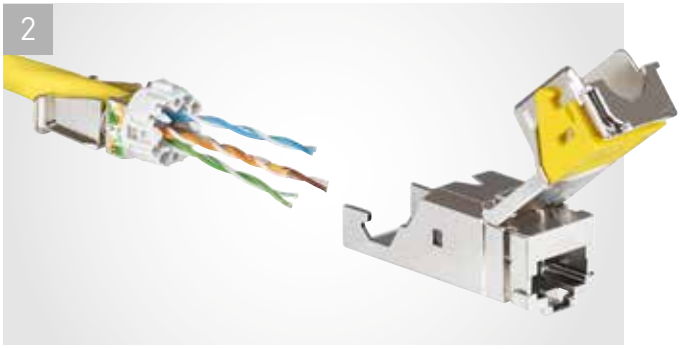
TOOLLESS CONNECTOR CONNECTION PHASES

1



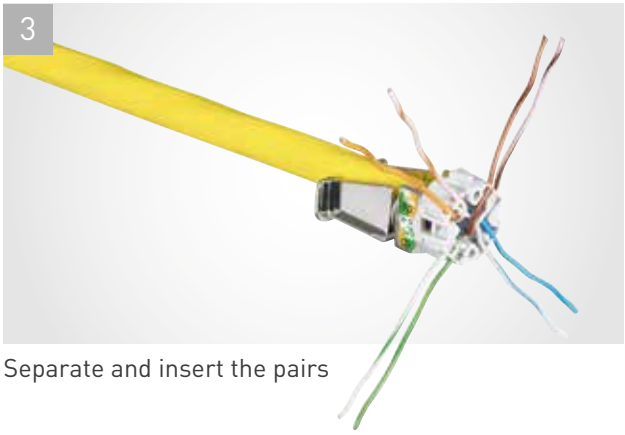
Take the wire housing

2



Pass the cable through the back of the wire housing

3



Separate and insert the pairs

4

Cut the pairs

5

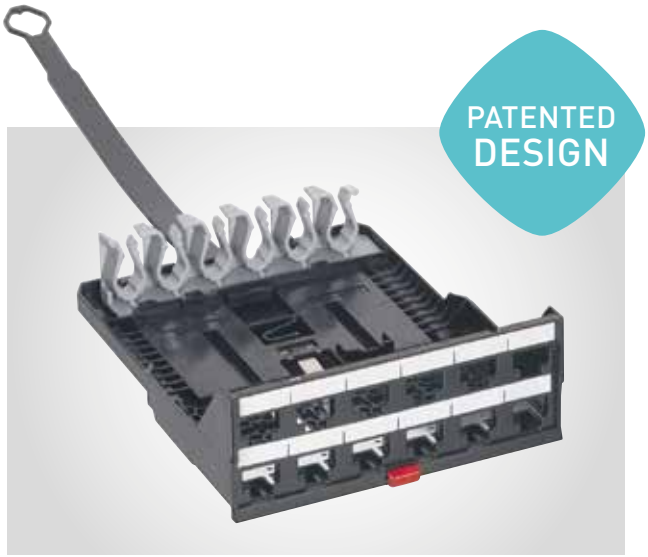
Install the wire housing without pushing

6

Push down the lever and lock the connector

COPPER SYSTEM PATCH PANELS

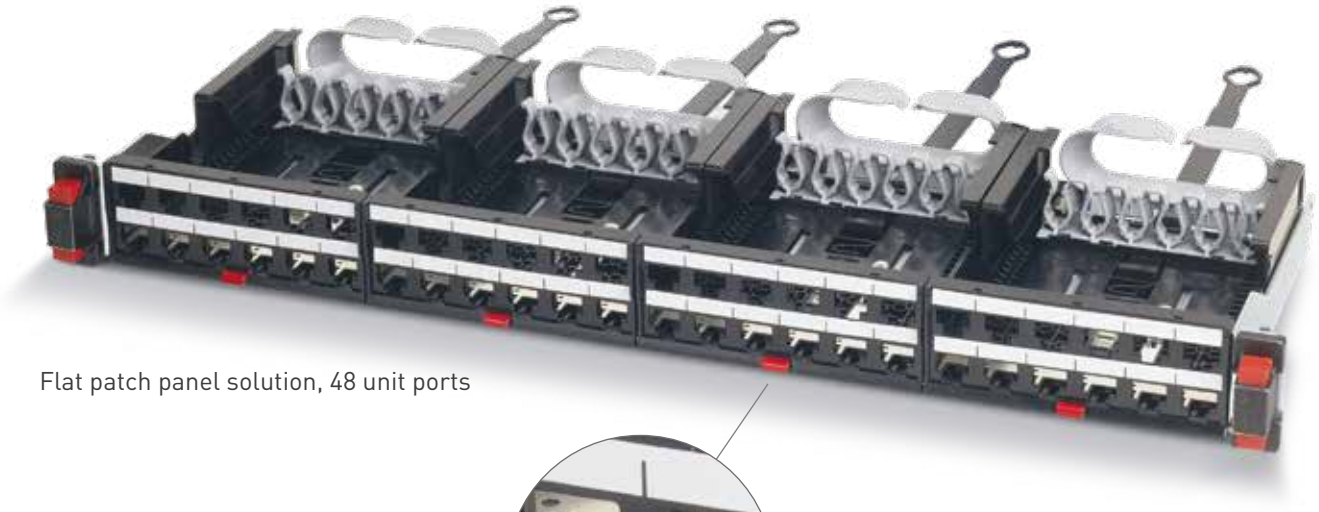
The patch panels have been designed and produced to optimize space, with up to 48 ports per unit and make maintenance and future upgrades easier.
They are available in both flat and angled versions.
They have a quick system for pulling out the unit and an innovative cable guiding system for tidy and easy cable management.



Block of 12 connectors for patch panel

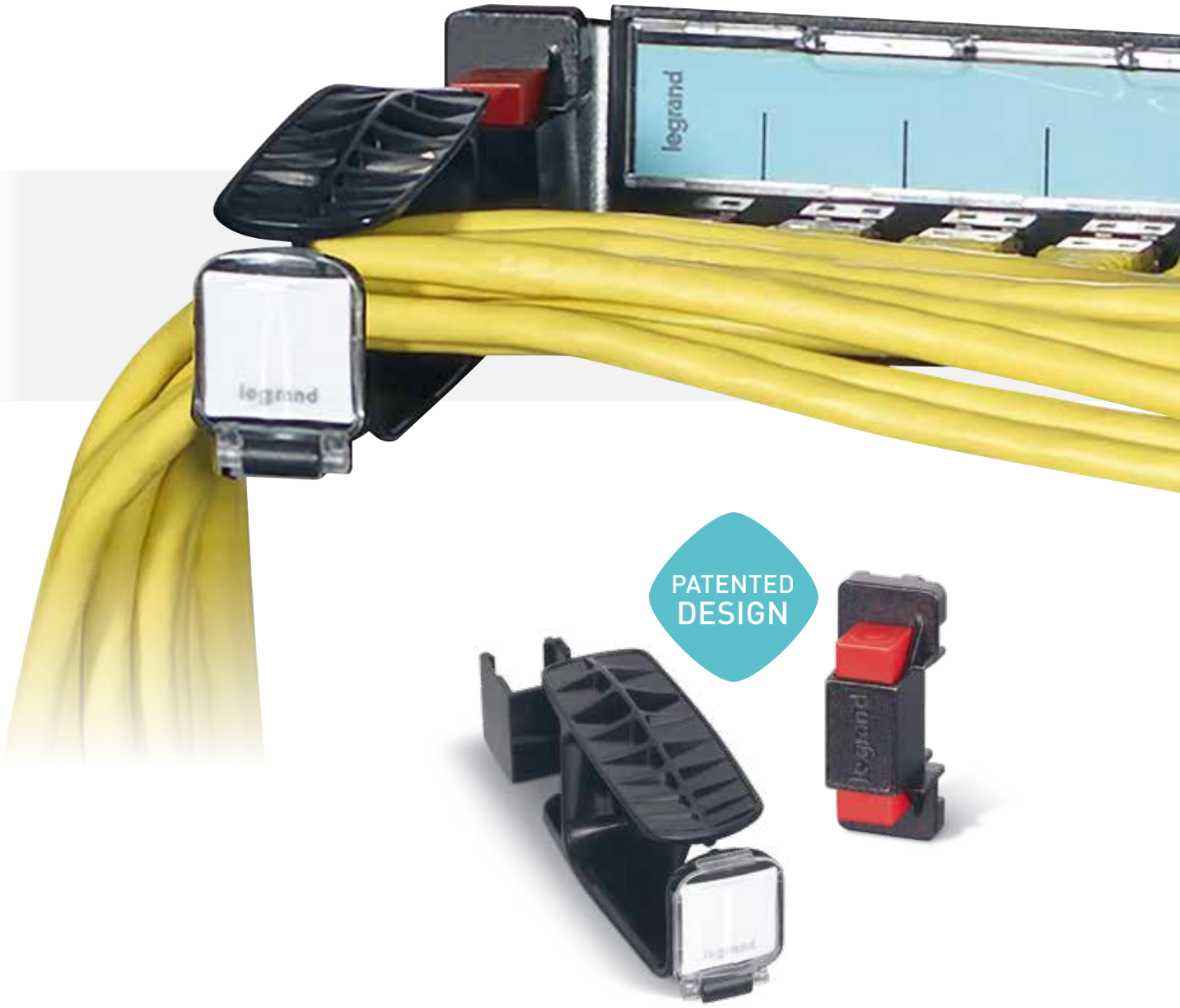
INNOVATIVE CASSETTES

- Sliding cassettes: easier maintenance
- Fast push-button extraction
- Innovative modular cassette system
- Easy maintenance: hands free solution, cassette maintained after extraction
- **Easy to mix with Legrand fiber optic solutions**



Flat patch panel solution, 48 unit ports

Fast push-button extraction



PATENTED DESIGN

QUICK-FIX SYSTEM

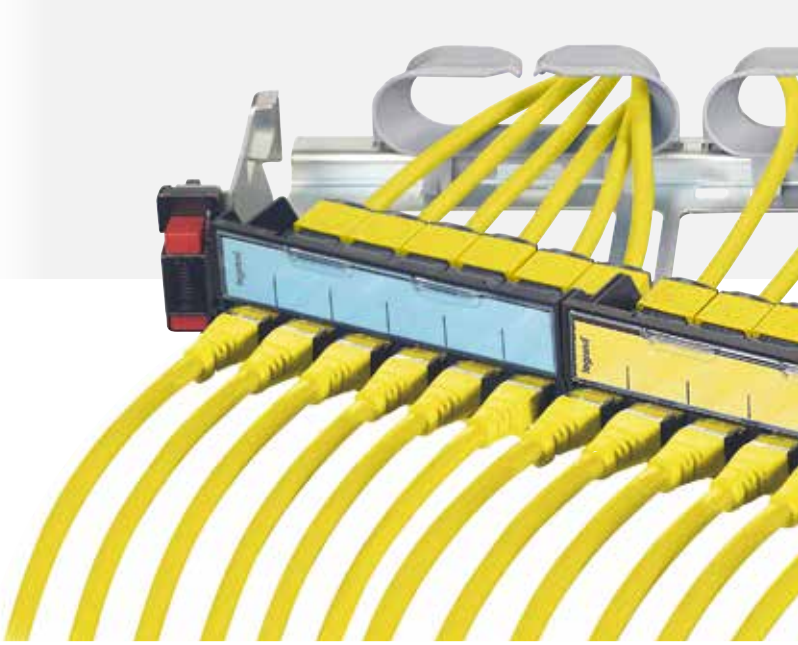
Innovative quick-fixing solution:
- Push and connect system
- Automatic earth connection
- In-rack cabling optimized
- Accessory for patch cords with rotating system for angle adjustment and label holder

Compatible with all panels (flat, angled, HD)

ANGLED PATCH PANEL SOLUTION FROM 24 TO 48 PORTS PER UNIT

Patch panels with an angled design which allows the cable to run into each side of the rack, creating a correct cable radius of curvature.

This avoids the need to manage the cables horizontally, and allows the patch cords to be carried directly in the vertical cavities.



Tidy cable management

Quick-fix system

Simple and efficient
identification of the ports

Also available
in the 24-port version

FIBER OPTIC SYSTEM
MEET-ME ROOM SOLUTIONS

An ever-increasing number of data centers are being used, and at ever higher bandwidths, to meet the growing demand for computing capacity.

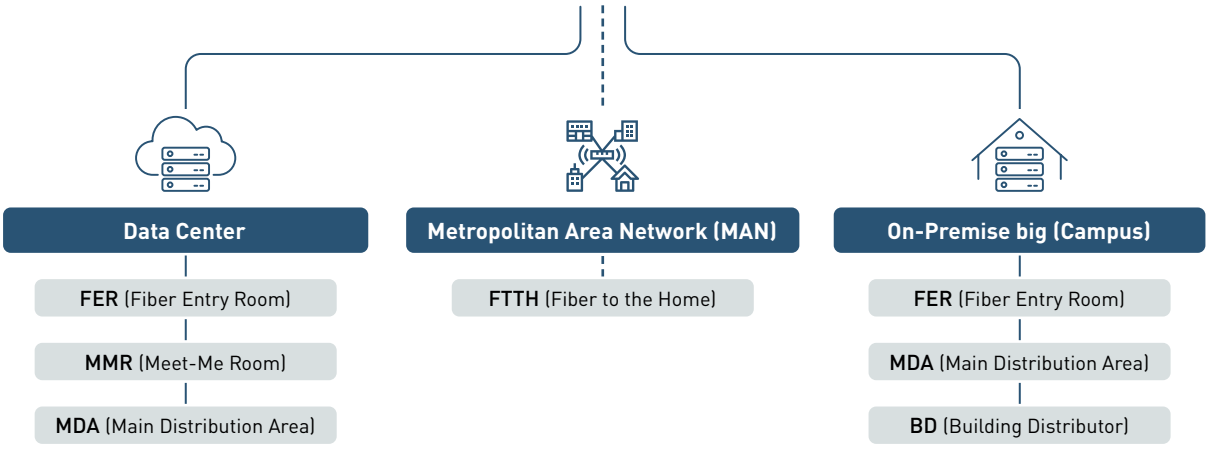
And whether it's a regional data center, a colocation data center or a hyperscaler, access to the outside world and therefore fiber connectivity is vital for this.

COMBINING HIGH DENSITY AND HIGH QUALITY

The Legrand LCS³ Meet-Me Room portfolio offers a fully scalable solution that seamlessly responds to both the high fiber numbers used in this type of environment and the high quality and reliability that comes with it.

The innovative concept also offers the possibility of adding extra functionalities where necessary, such as WDM Mux/Dmux or PON integration.
With this, the concept also offers excellent application possibilities in so called Telco environments or for example on-premise connectivity.

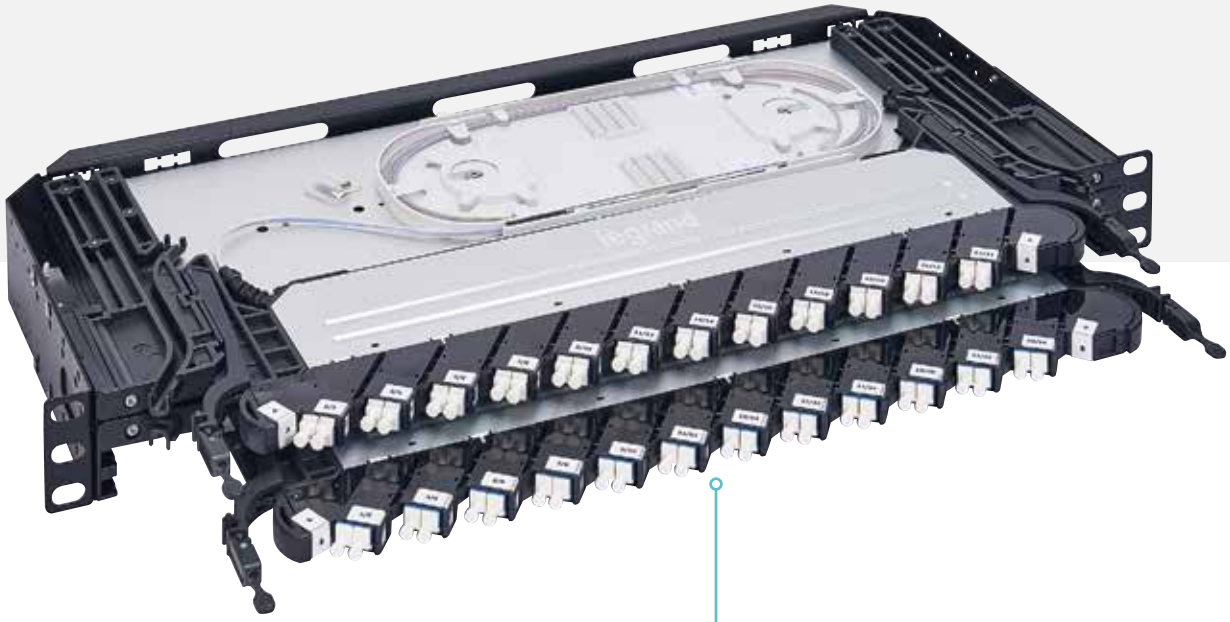
TYPICAL DEPLOYMENT OPTIONS LEGRAND MEET-ME ROOM PORTFOLIO



OPTIMIZED AND SIMPLIFIED PATCHING

A good network does not only stand or fall with a good connectivity solution, also all preconditions have to be fulfilled correctly. The Legrand Meet-Me Room portfolio therefore consists of an Optical Distribution Frame (ODF) with optimized patch management, especially designed for high density applications. Even with more than 4,000 patches in an ODF frame, this allows the patches to be ranked in a structured way.

Letter marking to spot storage and facilitate cord management

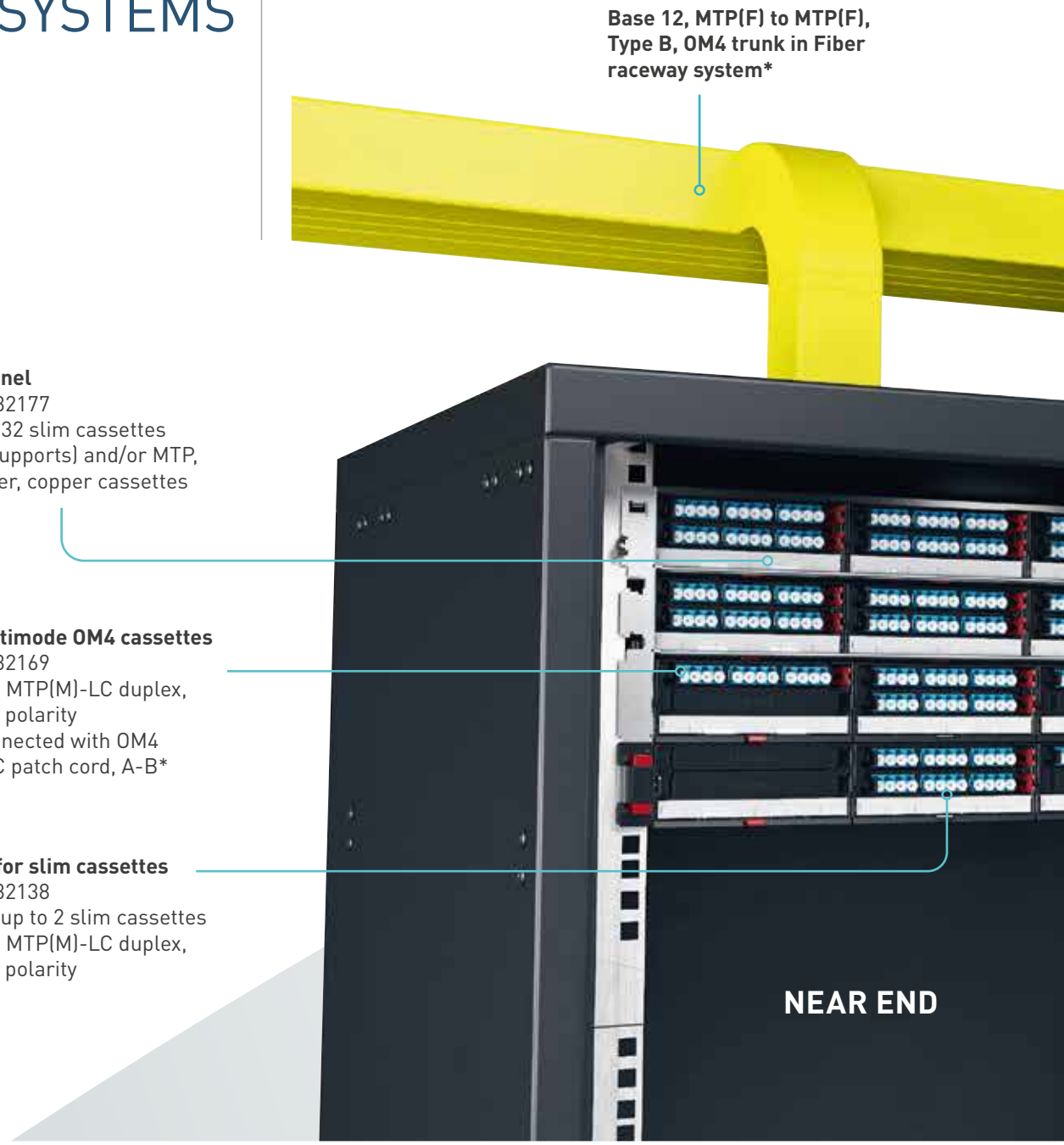


In order to simplify patching, the Meet-Me Room ODF patch panels are equipped with a slide-forward function, which makes the patch surface easily accessible, even in case of full patching.

A unique advantage of the Meet-Me Room patch panel is the ability to use it fully front loaded. Patch cabling and incoming cabling are fed in from the front, separated from each other, so that moves, adds and changes are easy to perform.

FIBER OPTIC SYSTEM CREATING FULL HD SYSTEMS

Legrand boosts its high density offer for building networks and data center applications within LCS³ fiber systems. From 1U to 4U, they support the fiber and equipment port density required for all networks with high and even ultra high density.



* Configurated offer possible on request

Slim multimode OM4 cassettes
Cat.No 032169
12 fibers, MTP(M)-LC duplex, universal polarity
To be connected with OM4 duplex LC patch cord, A-B*

1U HD panel
Cat.No 032175
Can hold 8 slim cassettes (into 4 supports) and/or MTP, splice fiber, copper cassettes

Support for slim cassettes
Cat.No 032138
Can take up to 2 slim cassettes 12 fibers, MTP(M)-LC duplex, universal polarity

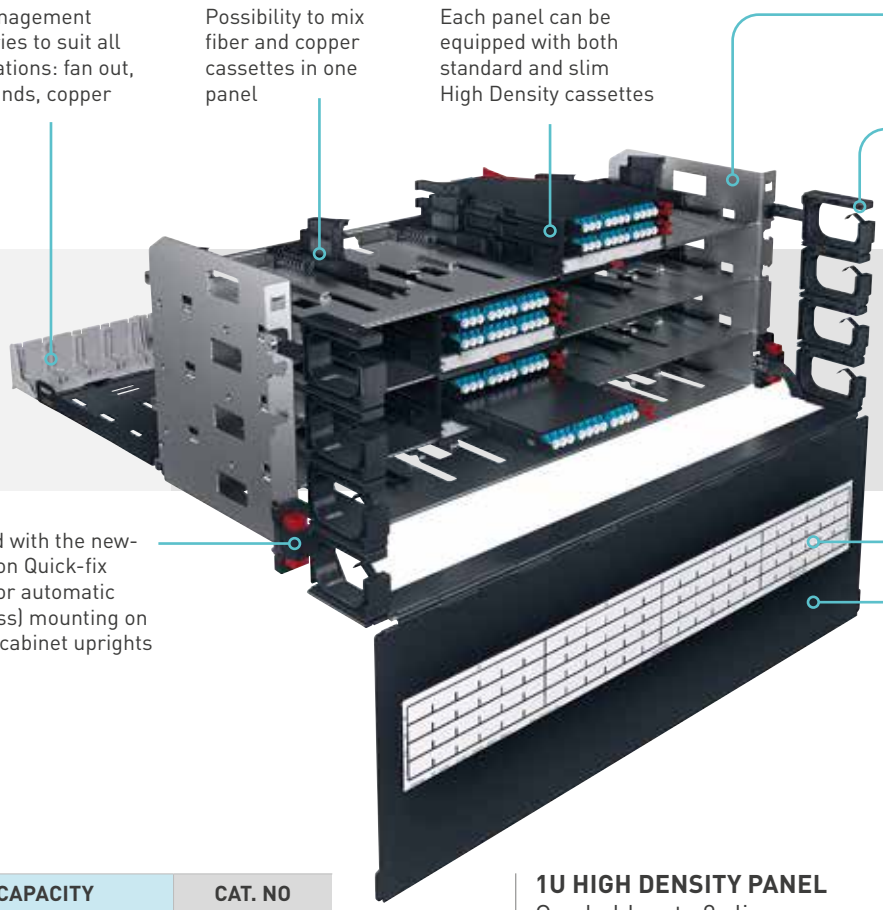
FIBER OPTIC SYSTEM HIGH DENSITY MODULAR PANELS

FROM 1U TO 4U

Optimize space and connectivity with our three HD modular panels! These quick-fixing solutions (automatic mounting and automatic grounding on 19'' uprights) offer you optimum capacities per U: 96 in LC version, 48 in SC version and 24 in ST version! Keeping link connections accessible and manageable, they offer slim and mix-media cassettes.

4U HIGH DENSITY PANEL

Can hold up to 32 slim cassettes (into 16 supports)



CAPACITY	CAT. NO
1U High Density panel	032175
2U High Density panel	032176
4U High Density panel	032177

1U HIGH DENSITY PANEL

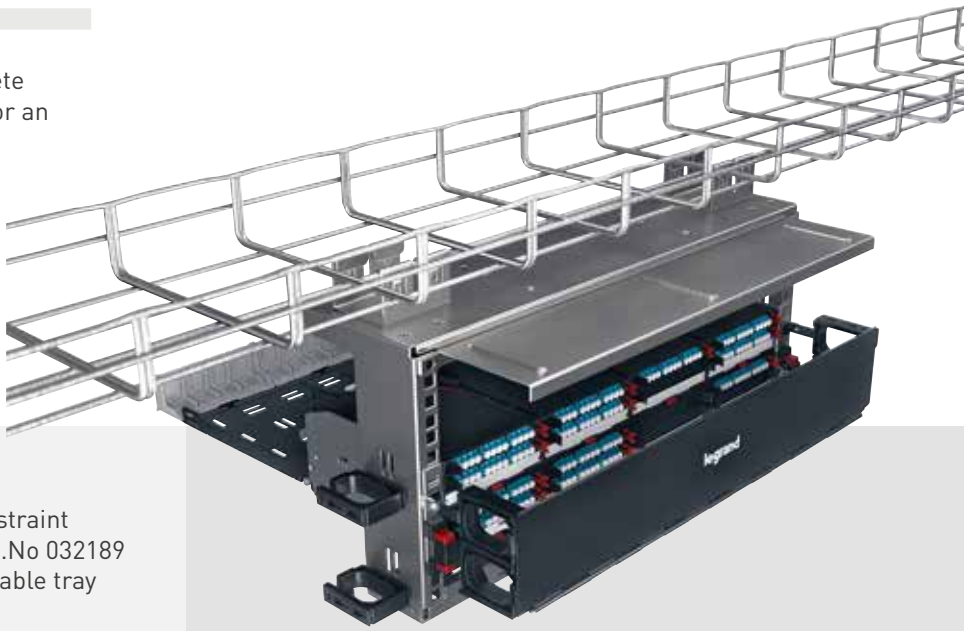
Can hold up to 8 slim cassettes (into 4 supports)

2U HIGH DENSITY PANEL

Can hold up to 16 slim cassettes (into 8 supports)

FLEXIBILITY OF INSTALLATION

Our high density modular panels offer complete freedom of installation: opt for a top-of-rack or an in-rack installation depending on your site constraints and your infrastructure's configuration!



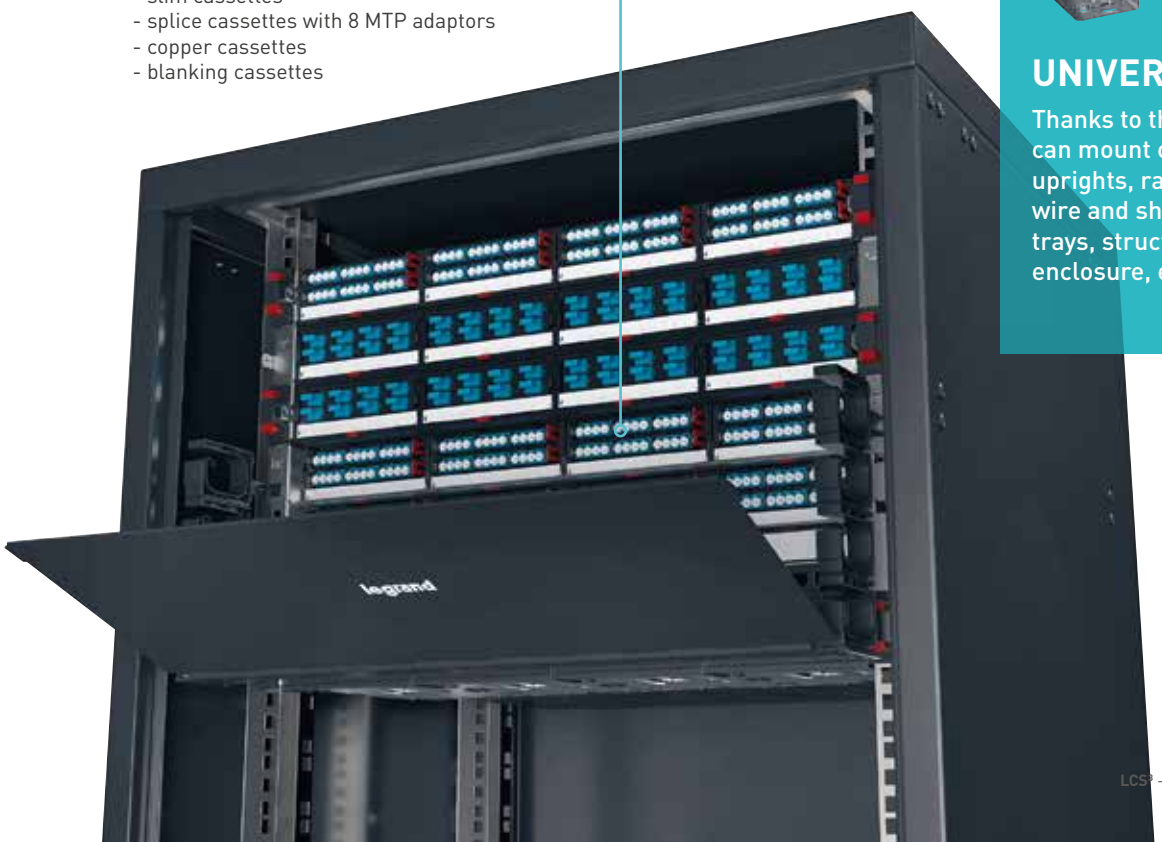
TOP-OF-RACK INSTALLATION

Optimize space and meet any technical constraint thanks to the overhead solution! The kit Cat.No 032189 enables you to fix the modular panels to a cable tray (Cablofil) above of the enclosure.

IN-RACK INSTALLATION

Easily mount the modular panels directly into the LCS³ enclosures and equip them with any type of cassettes in order to meet your specific needs!

1U, 2U and 4U panels equipped with:
- slim cassettes
- splice cassettes with 8 MTP adaptors
- copper cassettes
- blanking cassettes



UNIVERSAL FIXING

Thanks to the Zero-U kit, you can mount cassettes on 19" uprights, raised access floors, wire and sheet metal cable trays, structural uprights of the enclosure, etc.

FIBER OPTIC SYSTEM CASSETTES

SLIM SOLUTIONS FOR GREATER CONNECTIVITY

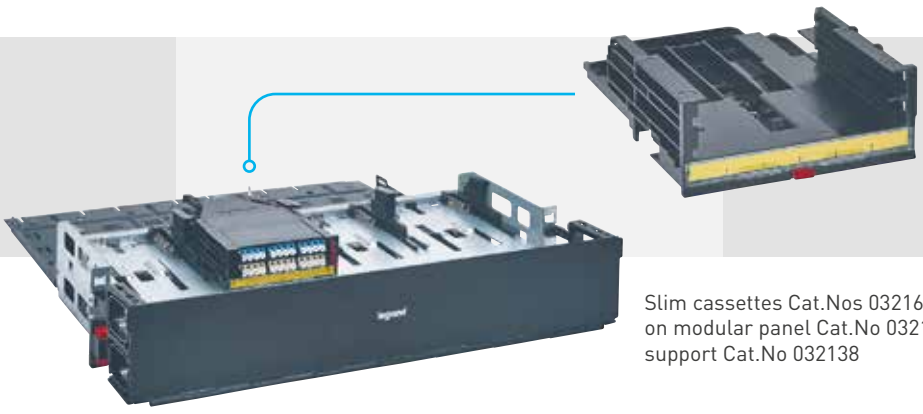
Optimize space and increase the connectivity capacity of your infrastructure with the slim cassettes! Easy to install and to maintain from rear and front, they prove to be agile and flexible under all circumstances.

- Mounting either on High Density modular panels or in Zero-U kit
- Single-mode and multimode MTP solutions that can be mixed on the same support
- Sliding cassettes individually removable from front and rear: accessible and easily manageable
- Equipped with extraction button for easy maintenance: reduced time, cost and risk of MAC
- High-performance with low insertion loss
- Universal polarity offering flexibility in case of changes

TYPE	CAT. NO
12 LC OM5 multimode	On demand
12 LC OM4 multimode	032169
12 LC OM3 multimode	032168
12 LC OS2 single-mode	032170
Blanking module	032139

OM4 multimode slim cassette - Cat.No 032169

OS2 single-mode slim cassette - Cat.No 032170



Slim cassettes are to be mounted on HD modular panels with support Cat. No 032138. The support can take up to 2 slim cassettes.

Slim cassettes Cat.Nos 032169/70 mounted on modular panel Cat.No 032176 with support Cat.No 032138

FIBER OPTIC PATCHING KITS

ZERO-U KIT FOR UNIVERSAL FIXING

The Zero-U kit Cat.No 032103 enables you to mount cassettes on 19" uprights, raised access floors, wire and sheet metal cable trays, structural uprights of the enclosure, etc.
The kit can take up to 2 slim High Density cassettes Cat.Nos 032168/69/70 or 1 universal High Density cassette Cat.No 032159 or 032160.

- Efficient solution to optimize space without the need to add an enclosure
- Compatible with 1U, 2U and 4U High Density modular panels
- Easy mounting on cable trays (such as Cablofil) thanks to quick-fixing solutions

1U TO 4U KIT FOR OVERHEAD FIXING

No space available in your LCS^3 enclosure? The innovative kit Cat.No 032189 enables you to fix the High Density modular panels on wire cable trays, above the enclosure.

- Perfect toolless fitting on cable trays. Can also be installed on roofs of racks
- Maintains duplex multimode fiber architecture
- Scalable (move, add, change) and efficient (space optimization) system
- Easy installation and maintenance
- Can be equipped with fiber optic and copper solutions
- Compatible with automatically removable cassettes
- Accommodates the same solutions as 19'' patch panels

FIBER OPTIC SYSTEM READY FOR FUTURE APPLICATIONS!

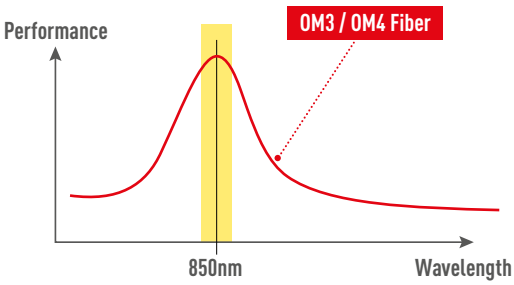
With our on-demand OM5 offer, we meet all your requirements in terms of connectivity! The infrastructure can easily evolve from 25 G or 50 G to 100 G and to 400 G thanks to parallel and multiplexing applications.

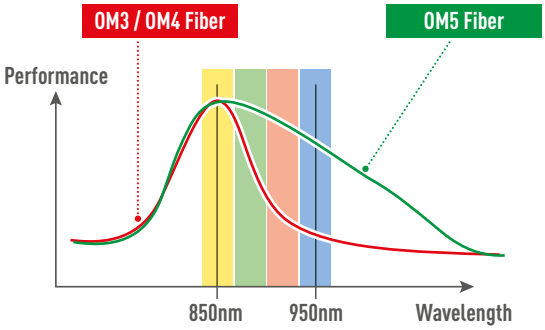
OM5 multimode MTP adaptor

OM5 12 LC multimode block

PERFORMANCE AND WAVELENGTH

OM3 and OM4 fibers are optimized according to the wavelength traditionally used: 850nm.
To accept the 4 signals used in multimode WDM, OM5 has been redesigned to accept wavelengths from 850nm to 950nm. The diagrams below provide a graphical representation.





APPLICATION UPGRADES

By considering all the current applications, either standardized or recognized through multi-source agreements, as well as draft applications to be standardized soon, we can establish the following evolutions of the applications optimized per type of multimode cabling:

1 Duplex channel for single wavelength (typically duplex LC connector with OM3 or OM4 fiber):
10GBASE-SR → 25GBASE-SR → 50GBASE-SR*

2 Duplex channel for multiple wavelength (typically duplex LC connector with OM5 fiber):
10GBASE-SR → 25GBASE-SR → 40G-SWDM4 → 50GBASE-SR → 100G-BiDi or 100G-SWDM4*

3 Multiple fiber solution for parallel optics (typically MPO connector with OM3 or OM4 fiber):
40GBASE-SR4 → 100GBASE-SR4 → 200GBASE-SR4*

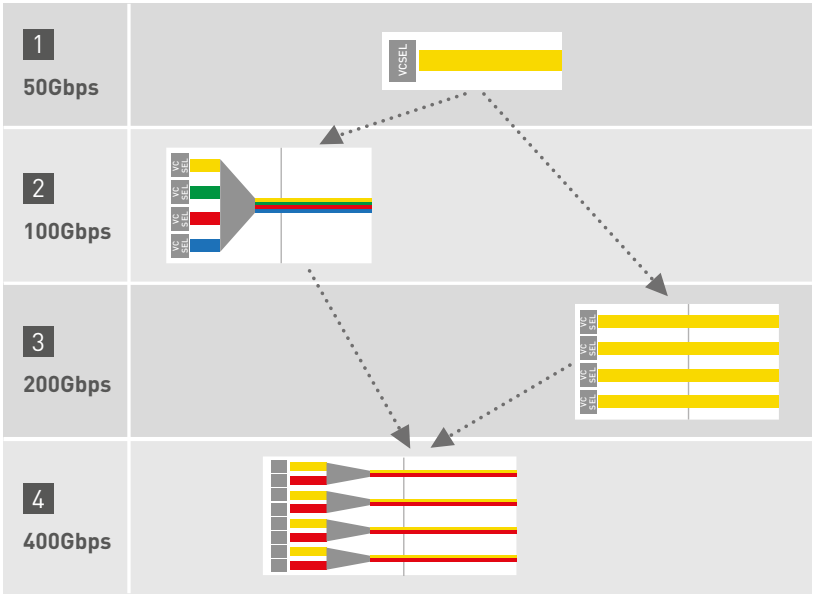
4 Multiple fiber solution for parallel optics and multiple wavelengths (typically MPO connector with OM5 fiber):
40GBASE-SR4 → 100GBASE-SR4 → 200GBASE-SR4 → 400GBASE-SR4.2 or 400G-BD4.2*

THE BEST OF BOTH WORLDS

To ensure the maximum lifespan of the fiber cabling, it is important to select the right fiber type and design. Today, a duplex OM4 channel can only expect to reach 50Gbps to the maximum distance. To reach 200Gbps, two options are available: duplex channel for multiple wavelength or multiple fiber solution for parallel optics.

But to reach 400Gbps, the best solution is the combination of all technologies together.

To allow the multimode fiber infrastructure to reach 400Gbps, the best option today is to provide for the full range of technologies. This currently means using OM5 cables with MPO connectors.



*See TR ISO/IEC 11801-9908: "Guidance for the support of higher speed applications over optical fiber channels" for further information. Note that some multiple wavelength applications can function on OM3 and OM4, but to limited distance.

CONTACT US FOR MORE INFORMATION ABOUT THE CUSTOMIZED OFFER

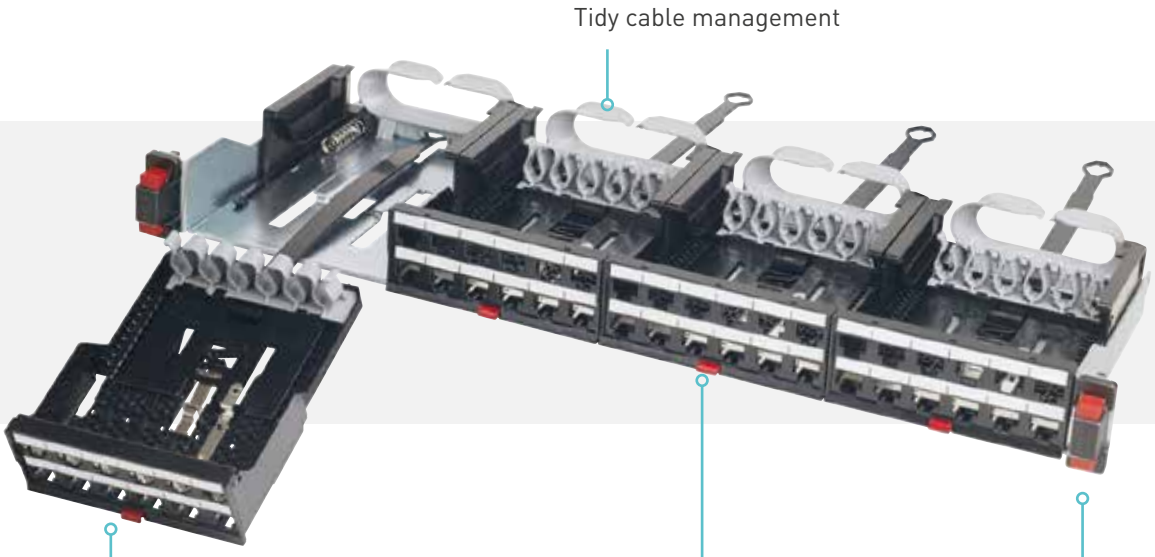
Efficiency

Legrand's LCS³ system offers you copper and fiber optic solutions designed to enhance your infrastructure's efficiency:

- 48 ports per unit for high density (Copper system)
- 90 LC per unit for high density (Fiber optic system)

COPPER SYSTEM
PATCH PANEL HD SOLUTION UP TO 48 PORTS PER UNIT

High-density patch panel. It has changed from 24 to 48 ports, guaranteeing a reduction in space occupied and making future upgrades easier. Designed to house 4 blocks of 12 connectors each.



COPPER SYSTEM
EASY INSTALLATION WITH CAT. 5e/6/6A FIELD PLUGS

These accessories are ideal for a link terminated with a plug on active equipment side (CCTV camera, Wi-Fi access point...).
It provides cost savings (faster installation) whilst ensuring an increased reliability.

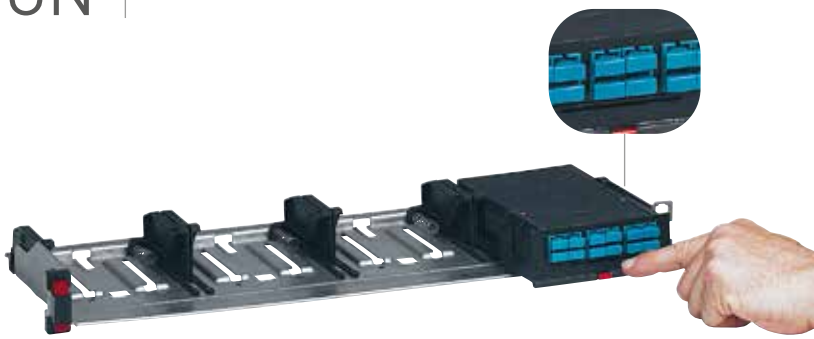
Cat. 5e & Cat. 6 UTP
RJ 45 field plugs

Cat. 5e & Cat. 6 FTP
RJ 45 field plugs

Cat. 6A STP toolless
RJ 45 field plug

FIBER OPTIC SYSTEM INNOVATIVE CASSETTES FOR EASY INSTALLATION

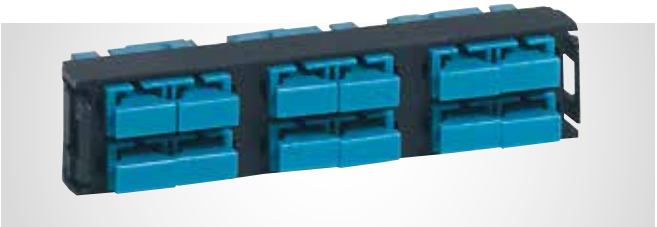
Legrand has launched innovative splicing cassettes which can be removed automatically by simply pressing them, simplifying installation and maintenance.



- For installation directly in modular panel Cat. No 032140.
- The splicing cassettes are removable from the front.

READY TO BE USED IN 1 CATALOGUE NUMBER!

- Pre-equipped cassettes with fitted fiber optic block (SC duplex or LC duplex, monomode or multimode)

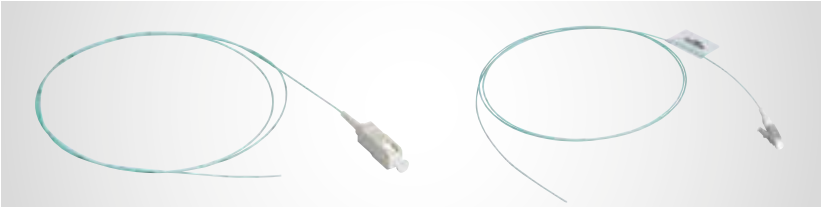


SC duplex high density fiber optic block for 12 multimode fiber optics

- Supplied with sets of 6 or 12 pigtails

Set of 12 OM3 LC-PC pigtails

- A very large offer of pigtails in 1 or 2 meters ; in OM3, OM4, OM5 on-demand, OS2 (OS1a compatible).
  Sets of 12 LC pigtails in OM3, OM4, OS2 (OS1a compatible)



OM3 (PC) pigtails, SC connectors

OM4 (PC) pigtails, LC connectors

LCS³

A GLOBAL OFFER

19" Enclosures

Easy

The digital revolution is happening: it's taking place both in our personal and business lives. The way we do our work, listen to music, interact with people, research products and buy services has almost entirely changed. And so have IT infrastructures to make this change possible.

An ever-increasing amount of data, faster processing speeds, larger storage requirements, the exponential rise in IoT and artificial intelligence, and so forth have posed new challenges; hence the need for clever solutions to ensure ever more efficient infrastructures.

Linkeo

NETWORK ENCLOSURE SYSTEM

CABINETS TO FIT YOUR SCS INSTALLATIONS AND YOUR BUDGET

LCS³

A GLOBAL OFFER

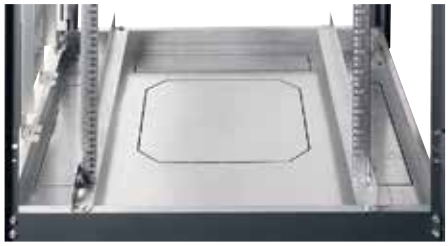
Linkeo
19" cabinets

A COMPLETE SOLUTION FOR COMMERCIAL SECTOR REQUIREMENTS

The new LINKEO 19" cabinets have been designed to be easy to install and totally functional.

With the wide range of accessories that can be used with LINKEO cabinets, you have the benefit of a complete offer to meet the requirements of all your projects.

1 19" uprights with U marking and adjustable depth



2 Pre-cut top and bottom cable entries
Cut-out in the roof for fan kits

3 All-glass door (reversible) which is screen-printed for a neat and attractive appearance

4 Removable side and rear panels with automatic earthing

5 Vertical cable tray (side and rear mounting) and optional PDU support

- Equipped with levelling feet
- Can be linked using a baying kit
- 2 delivery options: ready-assembled or flatpack

LCS³

A GLOBAL
OFFER

Linkeo 19"

Wall-mounting cabinets

A FULL RANGE!
CHOOSE YOUR LEVEL OF
ACCESSIBILITY INSIDE
THE CABINET

FIXED SIDE PANELS

19" version

10" version for small business applications

REMOVABLE SIDE PANELS

19" version

19" pivoting version

COMMON FEATURES

Reversible screen-printed safety glass door with integrated lock

- Supplied with 2 x 19" uprights, with adjustable depth and marking of the Us
- Additional 19" uprights as option

- Rear, top and bottom pre-cut cable entries to be equipped with brush (provided with the cabinet)
- Top perforations for natural ventilation (can be equipped with fan kit)

LCS³

A GLOBAL OFFER

Power Distribution Units

Flexibility

The PDU offer combines Legrand's quality and innovation with a wide range of applications. A standalone solution, this range integrates seamlessly into any installation, ensuring compliance with applicable standards.

SOLUTIONS FOR ANY CONFIGURATION

ZERO-U PDU

For data centers/server rooms

These are used in server cabinets where:
- there is a high density of active equipment
- electrical distribution quality is crucial

For vertical installation

1-U PDU 19"

For data centers, edge server rooms and computer rooms

These are used in patching and server enclosures where:
- there is a low density of active equipment to be powered
- ease of installation is an advantage

For vertical or horizontal installation

1-U PDU 10"

For small IT environments

These are mainly used in small-scale commercial applications where there are a limited number of computer workstations and a 10" cabinet is sufficient: small businesses, freelance professions, administrative services, etc.

For horizontal installation

ABOUT LEGRAND'S PDUS

GENERAL CHARACTERISTICS

- Anodized aluminium chassis: high-quality material, lightweight and rigid
- Modular design: expandable socket and function modules

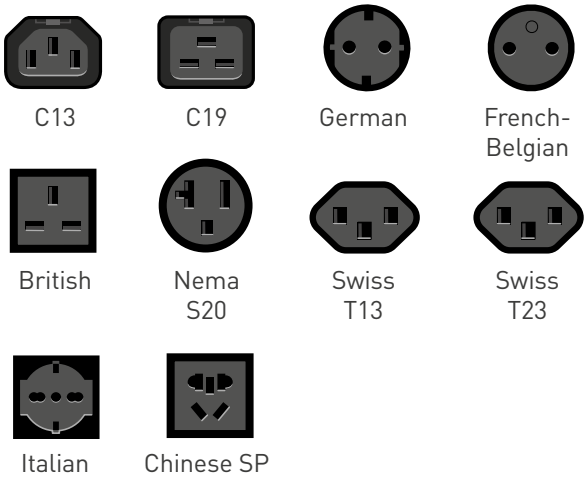
SAFETY

- High-quality electrics
- High-quality connection
- Sockets equipped with safety shutter
- Cord Locking system

POWER SUPPLY

- 16 A to 32 A, single - or three - phase
- PDUs incorporating both international and local type sockets

SOCKET STANDARDS



STANDARDS

IEC 60950 - Information technology equipment - Safety

IEC 60297-3 - Dimensions of mechanical structures of the 482.6 mm series (19 in)

IEC 60320-2-2 - Appliance couplers for C13 and C19 electrical equipment

IEC 60884-1 - French/Belgian and German standard plugs/sockets

BS 1363-2 - British standard plugs/sockets

IEC 60309 - Industrial plugs

Certification: CE, TSE, CCC

Environmentally-friendly products
Eco-design

LCS³

A GLOBAL OFFER

Power Distribution Units

Reliability & Safety

By bringing intelligence and innovation to the heart of networks, Legrand's PDU range ensures both reliability and safety in all types of infrastructure, from complete data centers to small-scale deployments.

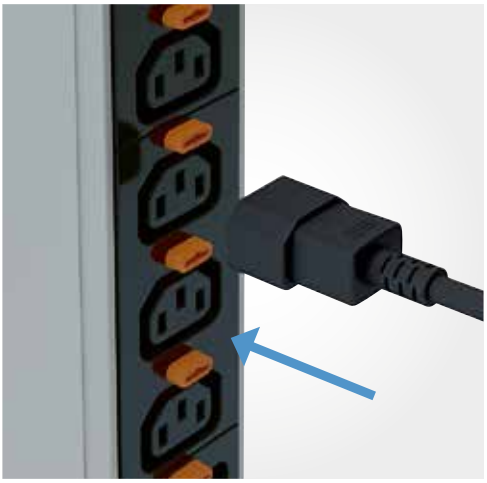
CORD LOCKING SYSTEM INNOVATION AT THE HEART OF PDUS FOR C13 & C19 SOCKET OUTLETS

Security of cable connection at rack level is a critical element which must be considered to ensure longevity of the installation. All Legrand PDUs have a power supply cord locking system which prevents accidental disconnection due to human error or vibration and guarantees absolute safety.

EASY IDENTIFICATION

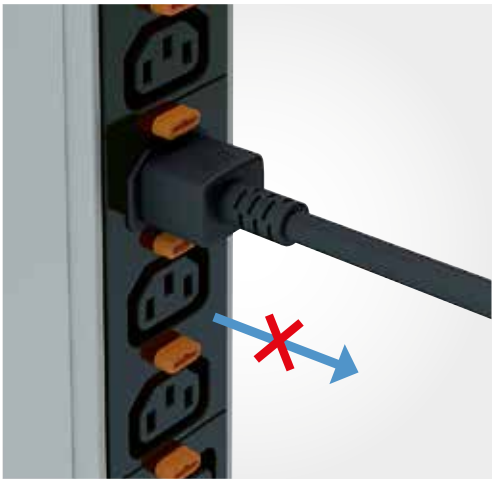
Very easy to identify thanks to the orange buttons next to each socket outlet

AN INNOVATIVE TECHNICAL SOLUTION



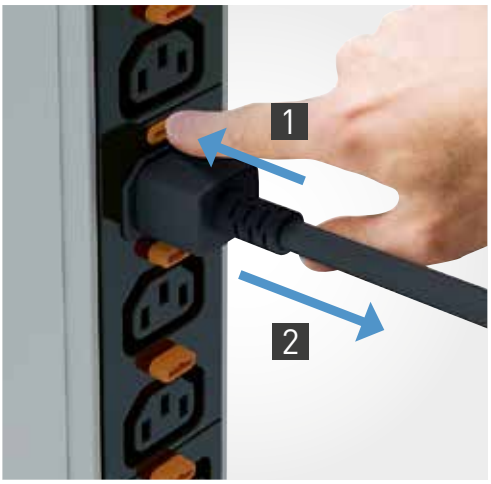
CORD CONNECTION

The cord is connected to the socket naturally in one smooth action



AUTO LOCKING

Cord held in place: once the power supply cord is connected, it locks automatically and cannot be removed

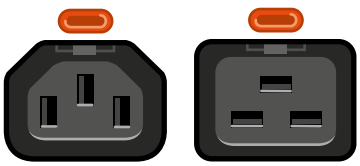


UNLOCKING

Easy removal: simply pressing the unlock button releases the cord from the socket

UNIVERSAL SYSTEM

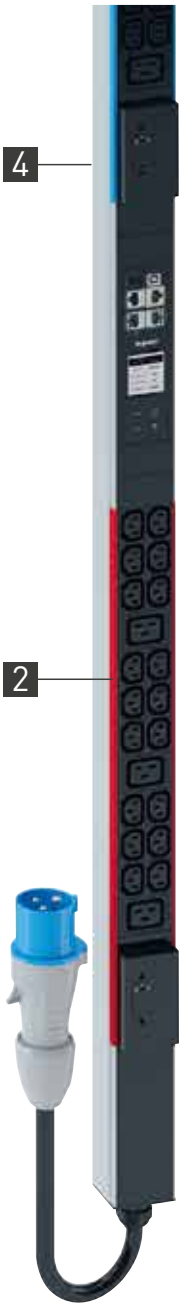
Takes all cords for standard C13 and C19 sockets



EXCLUSIVE TO LEGRAND

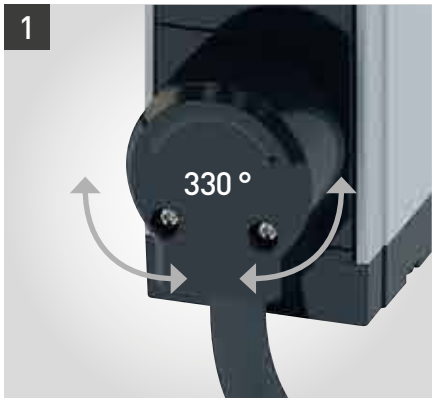
ZERO-U PDUS INNOVATION & PERFORMANCE: EXCLUSIVE INNOVATIONS

Every detail matters! Legrand's unique and original innovations help ensure optimum performance for the ZERO-U range of PDUs, in terms of safety, simplified setup and integration, consumption indicators, etc.



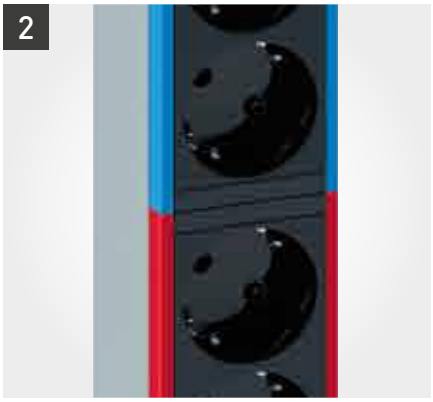
STANDARD STRUCTURE FOR BASIC PDUS

ROTATIVE CABLE ENTRY



Cable orientation
330° rotatable cable entry for perfect cable orientation and no interference in the cabinet

CIRCUIT MARKING

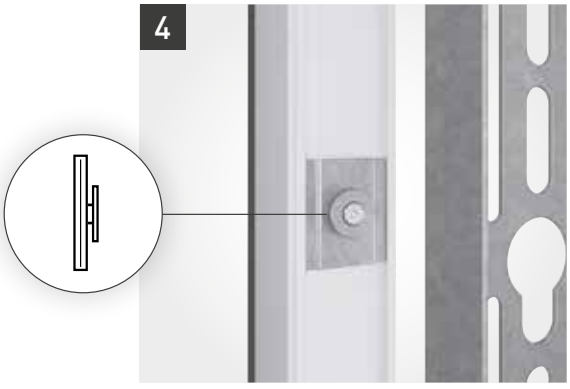


Circuit identification
Each circuit is colour-coded, with the colour visible on the front panel and along the edges of a module.
The colour corresponds to the specific MCB protecting the circuit.

ROTATIVE CABLE ENTRY

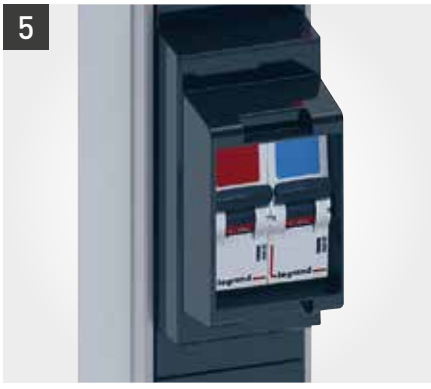
Enhanced protection
There are multiple solutions depending on power supply requirements

SCREWLESS MOUNTING



Fixed in buttonhole slots
ZERO-U PDUs simply clip vertically into buttonhole slots on the mounting bracket without the need for any screws.

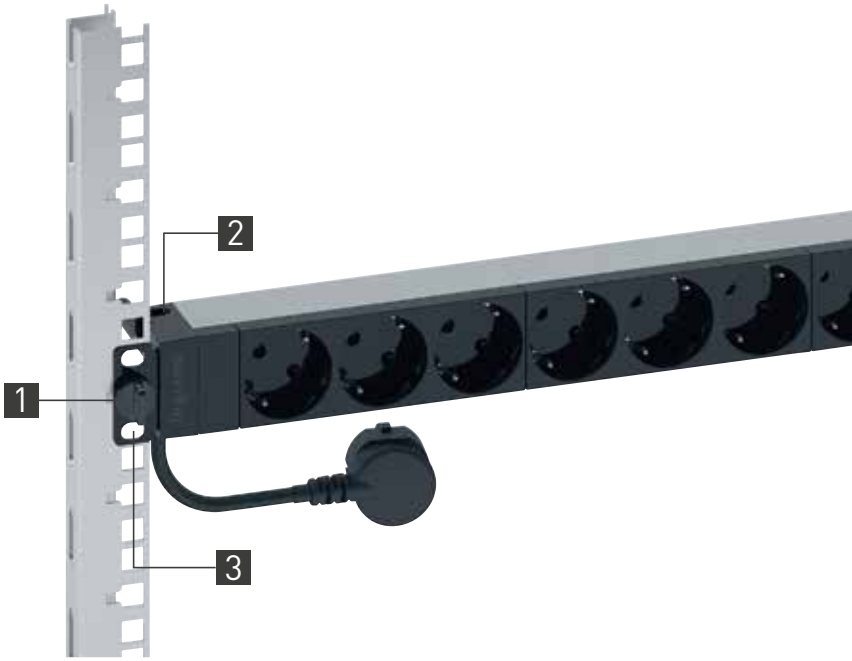
CIRCUIT BREAKER HOLDER



Enhanced protection
Circuits protected by a circuit breaker.
Holder with overhanging edges to prevent accidental breakages.
(Cover available on request)

1-U PDUS INNOVATION & CONVENIENCE: SIMPLE SETUP & INTEGRATION

The 19'' PDUs designed for installation in server cabinets and patch panels also incorporate the latest innovations for facilitating integration and maintenance, with clever mounting and operating features.

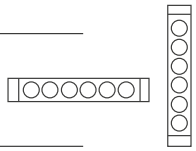


PDU 1 U 10”

Specially designed for local area networks, these PDUs feature the same innovations as the 19” range.

HORIZONTAL INSTALLATION

HORIZONTAL OR VERTICAL INSTALLATION



CORD LOCKING SYSTEM

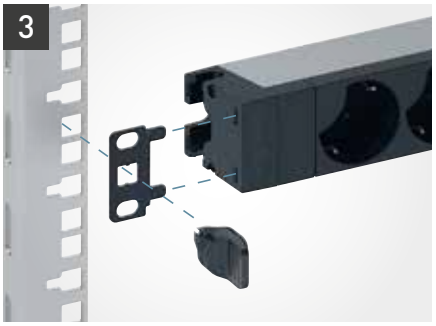
SNAP-ON FIXING

Toolless installation
Snap-on fixing on 19" uprights
No need for screws or nuts.
Toolless installation.

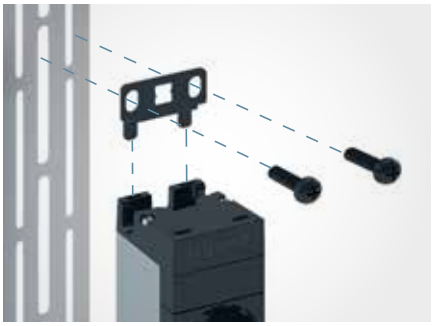
CABLE GUIDE

Optimising space
Cables are held firmly in place by a cable guide.

MOUNTING BRACKETS



Horizontal or vertical
Designed for horizontal toolless mounting, 1-U PDUs can also be mounted vertically simply by rotating the mounting lugs.



Vertical mounting requires a bolt and nut to fix the PDU securely to the bracket.

EXCLUSIVE TO LEGRAND

ACCESSORIES FOR PROTECTION: ENHANCED SAFETY CONTROL

Compatible with all the PDUs in the Legrand range, the complementary accessories allow you to control the socket power supply and protect against overvoltages.

SOCKET LOCKING CAP

Controlling access to the power supply
The locking cap can be used to lock access to a socket. A special key is required to unlock it. Locking caps are available for the following socket standards: C13, C19, German, French-Belgian, British.

SURGE PROTECTIVE DEVICE

Modular Surge Protection
The surge protection module protects equipment against overvoltages and incorporates hot swap technology. It can be used to replace a used module without interrupting the power supply to the other equipment connected to the PDU.

This is an essential accessory for business servers which need continuous protection. The module is equipped with a warning LED which indicates when it needs replacing.

✅ EXCLUSIVE TO LEGRAND

LCS³
A GLOBAL OFFER

Services & tools

Support you can rely on

It takes more than just sophisticated technological solutions to manage international projects successfully. What is really needed is the comprehensive and expert support of an experienced partner: from project design and choice of the right solution through to on-site logistics, installation and configuration, including any subsequent troubleshooting and maintenance.

YOUR PARTNER EVERY STEP OF THE WAY!

Legrand is ideally placed to offer this type of support, as all its products and solutions are developed and produced in close proximity to its customers.
Legrand also offers a wide range of special services and support tools which create genuine added value by making customers' day-to-day business significantly easier. This support is available at every stage of the project, whatever the customer touchpoint.

A diverse range of digital tools including websites, social media and news feeds so you can contact Legrand at any time and stay up to date with all essential news that is relevant to your projects.

Personal advice, technical support and documents, white papers, catalogues and e-catalogues, and BIM objects to help with product choice or drawing up bills of materials.

Training courses covering actual product expertise as well as the latest developments in technology, standards and regulations. Customized training courses available on request, either face to face or in virtual online classes.

Confident in the quality of its solutions, Legrand offers to warranty continuity of performance of its cabling system for copper and/or fiber optic over 25 years.

Technical appendices

Standards

Introduction to standards

Standards, by definition, are voluntary. Projects must always be compliant to:

- Laws
- Regulations
- Codes

Then standards are used as methods to ensure inter-operability of the systems used. These are chosen according to the needs of the project.

The international standard for telecommunications cabling infrastructure is the ISO/IEC 11801 series.

This standard is adopted by many countries after eventual translation.

The EN 50173 series is the equivalent European standard. It is adopted by all European countries.

While there are multiple national standards, the most significant is the ANSI/TIA, from North America (for both USA and Canada), and is voluntarily used in many other countries. These 3 series are described below.

In general, a project should be compliant to the national standard, if existing, and it may also be chosen to be compliant to the international standard to ensure full compatibility. But it would be unusual for a project in a country with a national standard to require only compliance to a national standard for another country. This would increase risks of noncompliance to national regulations and could add difficulty to source the products.

For example, some of the installation standards are adapted to specific construction methods or fire codes.

Below is a table of recommended and not recommended compliance options, for a project in country "A":

Condition	Recommended	Not recommended
Country "A" has a national standard	Compliance to country "A" standard only*	Compliance to country "B" standard only
	Compliance to country "A" standard and international standard	Compliance to country "A" standard and country "B" standard
Country "A" does not have a national standard	Compliance to international standard only	Compliance to country "B" standard only

* This is assuming that country "A" has absolutely all requirements in the standards. This is extremely rare and very often the national standards will cite international standard for information not available in national documents.

For performance measurements, compliance to multiple standards can be required for specific customer needs, provided that they can be done with a harmonized test method and compared to various test limits in the software after testing.

Because PoE compliance is linked not only to the performance standards, but also to electrical standards, codes and regulations, it is critical to always chose the correct framework to avoid safety risk.

This document does not state all standards but only the primary ones needed for a compliant installation.

In the process of a Legrand 25-year warranty outside of North America, compliance to ISO/IEC or CENELEC is required.

This warranty is not applicable in North America. Contact Legrand local support to obtain the correct documents if needed for this region.

ISO/IEC 11801 series

GENERAL INFORMATION

ISO/IEC 11801 series is the international standard for generic cabling for customer premises. It is the most extensive series and is directly linked to IEC documents.

GENERAL REQUIREMENTS

The general architectures and the performance are in the **ISO/IEC 11801-1**: General requirements. It covers:

- Balanced cabling channels and links performance
- Coaxial cabling channels and links performance
- Fiber cabling channels and links performance
- Component requirements to meet those needs, citing the IEC documents for details

DEFINITION OF THE PROJECT

First the project type must be selected:

- **ISO/IEC 11801-2**: Office premises
- **ISO/IEC 11801-3**: Industrial premises
- **ISO/IEC 11801-4**: Single tenant homes
- **ISO/IEC 11801-5**: Data centers

The **ISO/IEC 11801-6**: Distributed building services, may also be added as part of the project requirements if the cabling infrastructure covers not only cabling for information technology but also building services.

DESIGN AND INSTALLATION

These following 3 standards are required for compliance:

- **ISO/IEC 14763-2**: Planning and installation implementation.
- **ISO/IEC 14763-2-1**: Identifiers within administration systems
- **ISO/IEC 30129**: Telecommunications bonding networks for buildings and other structures

The ISO/IEC 11801-6: Distributed building services, may also be added as part of the project requirements if the cabling infrastructure covers not only cabling for information technology but also building services.

TESTING

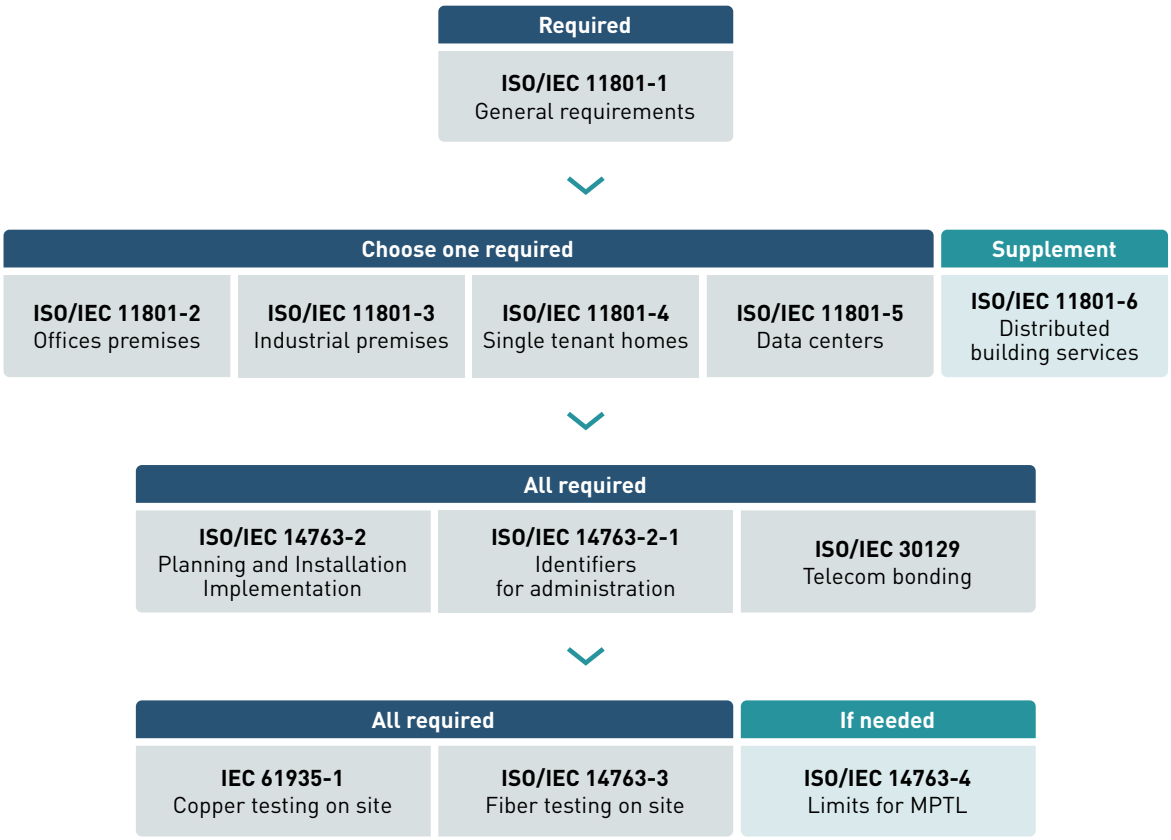
The copper testing is found in an IEC document: **IEC 61935-1**: Installed balanced cabling as specified in ISO/IEC 11801-1 and related standards.

ISO/IEC 14763-4 is a new addition covering limits for MPTL (Modular Plug Terminated Links).

The fiber testing is found in **ISO/IEC 14763-3**: Testing of optical fiber cabling.

DIAGRAM

The diagram of compliance is the following:



CENELEC EN 50173 series

GENERAL INFORMATION

The CENELEC EN 50173 series is the European standard for generic cabling for customer premises. It is extremely similar to ISO/IEC 11801 series with some adaptation for the European market. It is also linked to the IEC standards.

GENERAL REQUIREMENTS

The general architectures and the performance are in the EN 50173-1: General requirements. It covers:

- Balanced cabling channels and links performance
- Coaxial cabling channels and links performance
- Fiber cabling channels and links performance
- Component requirements to meet those needs, citing the IEC documents for details

DEFINITION OF THE PROJECT

First the project type must be selected:

- **EN 50173-2**: Office premises
- **EN 50173-3**: Industrial premises
- **EN 50173-4**: Single tenant homes
- **EN 50173-5**: Data centers

The **EN 50173-6**: Distributed building services, may also be added as part of the project requirements if the cabling infrastructure covers not only cabling for information technology but also building services.

DESIGN AND INSTALLATION

These following 4 standards are required for compliance:

- **EN 50174-1**: Installation specifications and quality assurance
- **EN 50174-2**: Planning and installation implementation
- **EN 50174-3**: Installation planning and practices outside buildings
- **EN 50310**: Telecommunications bonding networks for buildings and other structures

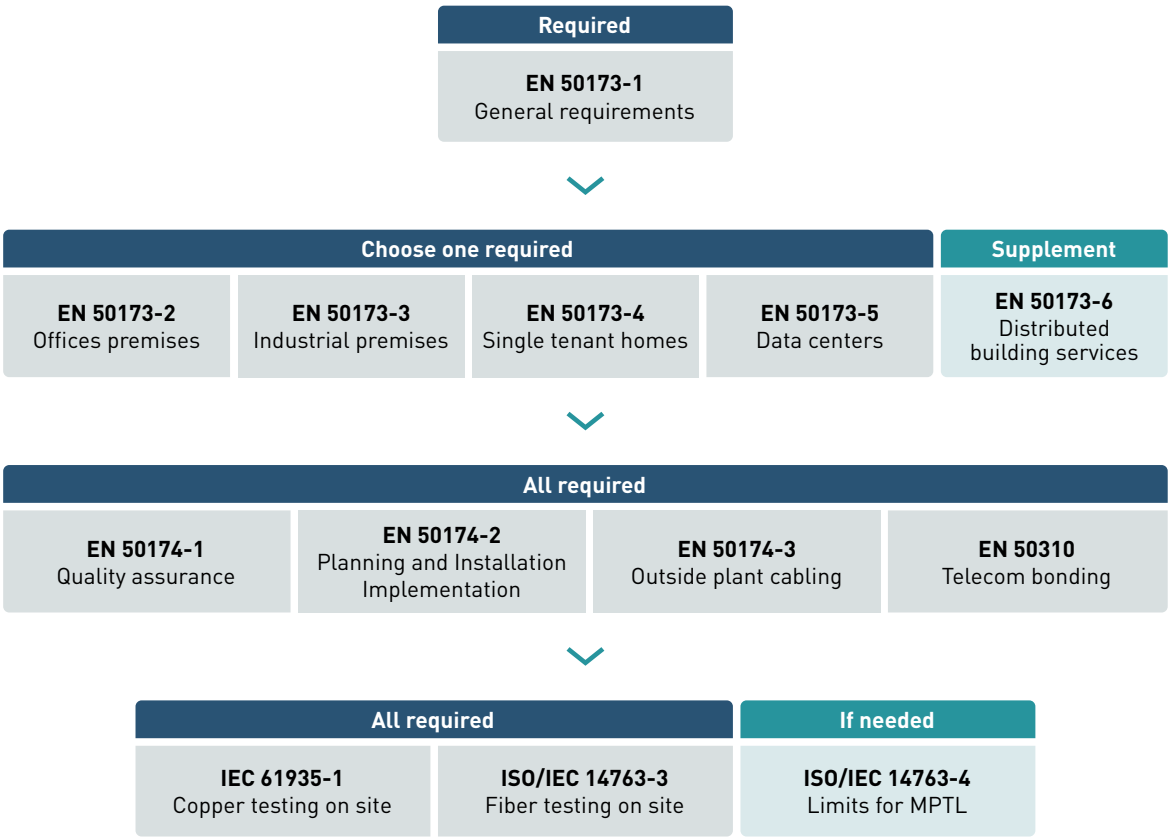
Indeed, the system must be installed properly, and the bonding network needs to be adapted.

TESTING

Testing is mostly absent or obsolete in the CENELEC documents. So testing should follow the same documents as ISO/IEC: **IEC 61935-1, ISO/IEC 14763-3, and ISO/IEC 14763-4.**

DIAGRAM

The diagram of compliance is the following:



ANSI/TIA 568 series

GENERAL INFORMATION

The ANSI/TIA 568 series is the North American standard for generic cabling for customer premises. It is also similar to ISO/IEC 11801 series but with some variations in the structure and details of performance. It is also linked to the IEC standards for copper inter-operability and reliability as well as for fiber performance and testing.

GENERAL REQUIREMENTS

The general architectures are found in the ANSI/TIA 568.0. The performances are in the:

- **ANSI/TIA 568.2**: Balanced cabling channels and links performance
- **ANSI/TIA 568.3**: Fiber cabling channels and links performance
- **ANSI/TIA 568.4**: Coaxial cabling channels and links performance

These include the component requirements to meet those needs, citing the IEC documents for details of reliability and inter-operability.

DEFINITION OF THE PROJECT

The ANSI/TIA documents have the following premise definitions:

- **ANSI/TIA 568.1**: Commercial buildings
- **ANSI/TIA 1005**: Industrial premises
- **ANSI/TIA 570**: Residential
- **ANSI/TIA 942**: Data centers
- **ANSI/TIA 1179**: Healthcare
- **ANSI/TIA 4966**: Educational

The **ANSI/TIA 862**: Intelligent building systems may also be added as part of the project requirements if the cabling infrastructure covers not only cabling for information technology but also building services.

DESIGN AND INSTALLATION

These following 4 standards are required for compliance:

- **ANSI/TIA 569**: Pathways and spaces
- **ANSI/TIA 606**: Administration
- **ANSI/TIA 758**: Outside plant cabling
- **ANSI/TIA 607**: Telecommunications bonding networks

Indeed, the system must be installed properly, and the bonding network needs to be adapted.

TESTING

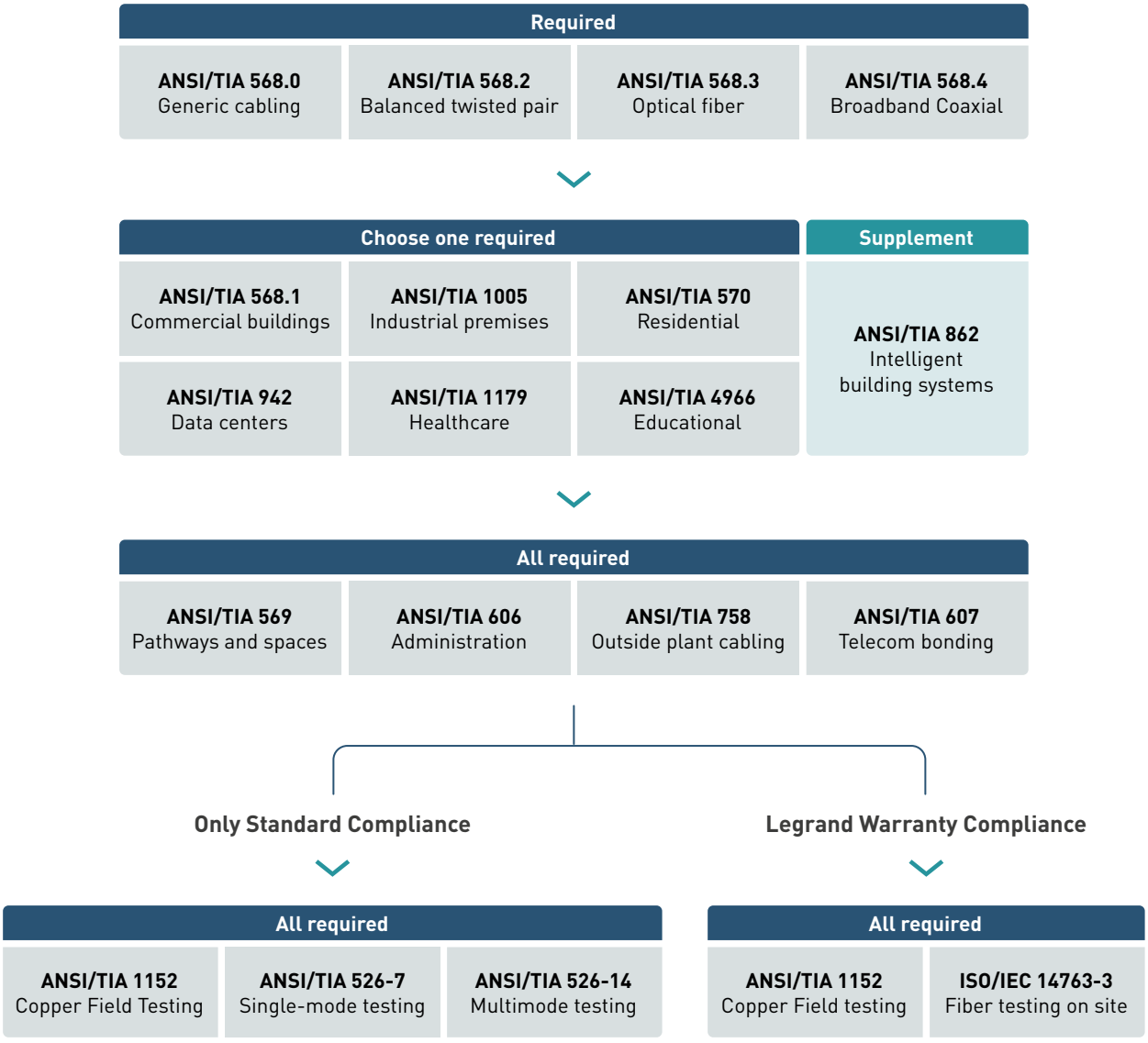
Copper testing limits are found in the **ANSI/TIA 568-2**, but the equipment requirements and the measurement methods are in the ANSI/TIA 1152.

Fiber testing is defined in the **ANSI/TIA 526-7** and **ANSI/TIA 526-14**. However, those are created from the **IEC 61280** series, which are also the base for the **ISO/IEC 14763-4** document.

The main concern of the ANSI/TIA documents is the lack of mandatory use of reference grade connectors for testing. The use of standard connectors leads to an uncertainty too high to ensure performance. So although there are currently available ANSI/TIA fiber testing documents, Legrand requires the use of reference cords for fiber testing, and therefore recommends the use of the **ISO/IEC 14763-3** standard, even for ANSI/TIA 568 compliance.

DIAGRAM

The diagram of compliance is the following:



Performance and architecture

Within customer premises, the importance of the cabling infrastructure is similar to that of other fundamental building utilities such as heating, lighting and mains power. As with other utilities, interruptions to service can have a serious impact. Poor quality of service due to lack of design foresight, use of inappropriate components, incorrect installation, poor administration or inadequate support can threaten an organization's effectiveness.

The standards for structured cabling systems provide:

a) users with an application-independent generic cabling system capable of supporting a wide range of applications.

b) users with a flexible cabling scheme making modifications both easy and economical.

c) building professionals (for example, architects) with guidance allowing the accommodation of cabling before specific requirements are known; that is, in the initial planning for either new construction or refurbishment.

d) industry and application standardization bodies with a cabling system which supports current products and provides a basis for future product development.

Such standards are, for example, ISO/IEC 11801 series, CENELEC 50173 series, ANSI/TIA 568 series.

They specify a multi-vendor cabling system which can be implemented with material from single and multiple sources, and related to:

a) standards for cabling components developed by committees, for example copper cables and connectors as well as fiber optic cables and connectors.

b) standards for the installation and operation of information technology cabling as well as for the testing of installed cabling (see Clause 2 and bibliography).

c) applications such as those developed by study groups of IEEE 802,

d) planning and installation standards which take into account the needs of specific applications for the configuration and the use of cabling systems on customer premises.

FIBER OPTIC

In fiber, the following are recognized in the standards:

Type		Comments
Multimode	OM1	Obsolete 62.5micron fiber. No longer recognized
	OM2	Legacy 50micron fiber. No longer recommended
	OM3	Original fiber designed for 10Gbps. Minimal recommended fiber
	OM4	Provides the same applications as OM3, but for longer distances
	OM5	New fiber optimized for multiple wavelengths (WDM) for new and future applications
Single-mode	OS1a	Indoor single-mode fiber
	OS2	Outdoor single-mode fiber

In general, although it supports legacy applications to longer distances, OM4 is installed for short links up to 100m for current applications, while OM5 is installed to allow a wider recent and future application compatibility.

For long distance, OS1a/OS2 is used depending on the environment.

COPPER

In copper, the following are recognized:

ANSI/TIA		ISO/IEC and CENELEC	
Components	Systems	Components	Systems
Category 3	Category 3	Category 3	Class C
Category 5e	Category 5e	Category 5	Class D
Category 6	Category 6	Category 6	Class E
Category 6A	Category 6A	Category 6A	Class EA
		Category 7	Class F
		Category 7A	Class FA
Category 8	Category 8	Category 8.1	Class I
		Category 8.2	Class II

However, for new installations, only Cat. 6 and better can be used for horizontal cabling, while only Cat. 6A and better can be used for data centers.

Categories 7, 7A and 8.2 are not recognized in ANSI/TIA standards since they do not use the universal RJ45 connector but rather 2 alternative non-compatible connectors that are not existing on active equipment. Legrand recommends not using those solutions as the global market share of less than 1% (source BSRIA) proves the lack of interest of the industry.

These Categories allow the following applications:

	Class D (Cat.5e)	Class E (Cat.6)	Class EA (Cat.6A)	Class I (Cat.8)
1000Base-T	100m	100m	100m	100m
2.5Gbase-T	Possible[1]	Possible[1]	100m	100m
5Gbase-T	Possible[1]	Possible[1]	100m	100m
10Gbase-T	N/A[3]	Possible[2]	100m	100m
25Gbase-T	N/A[3]	N/A[3]	Possible[4]	30m
40Gbase-T	N/A[3]	N/A[3]	Possible[4]	30m

[1] Follow ISO/IEC TR 11801-9904 or TIA TSB 5021 to evaluate possibility on installed links. Distance will depend on many factors
[2] Follow ISO/IEC TR 24750 or TIA TSB 155-A to evaluate possibility on installed links. Distance will depend on many factors
[3] Not Available
[4] Follow ISO/IEC TR 11801-9905 to evaluate possibility on installed links. Distance will depend on many factors

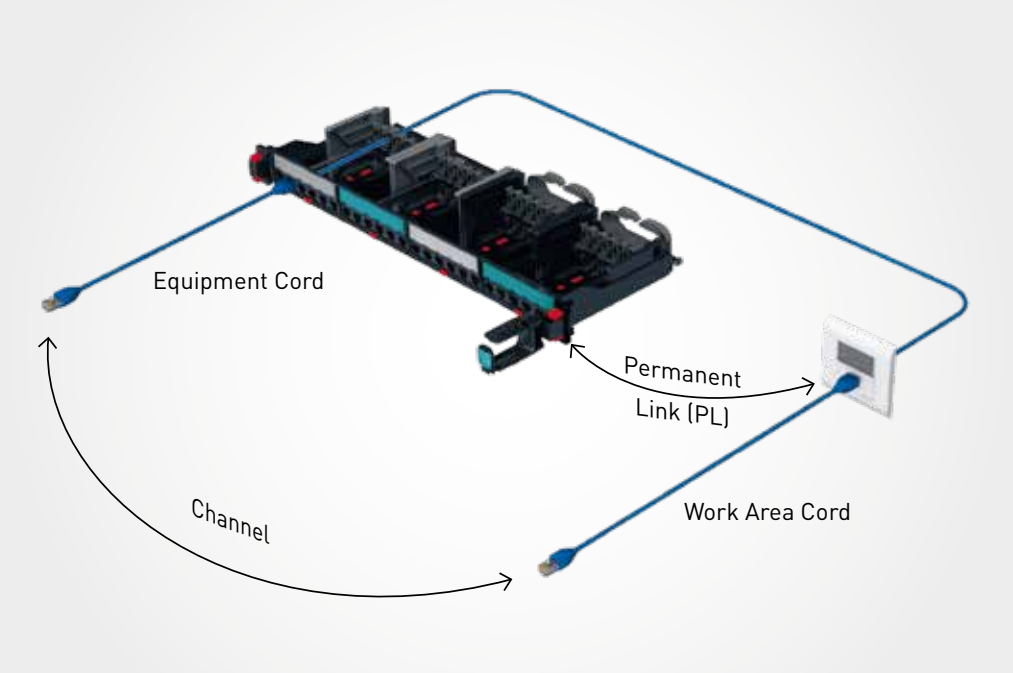
HORIZONTAL CABLING TOPOLOGIES

The standards recognize 2 main types of RJ45 copper connectors:

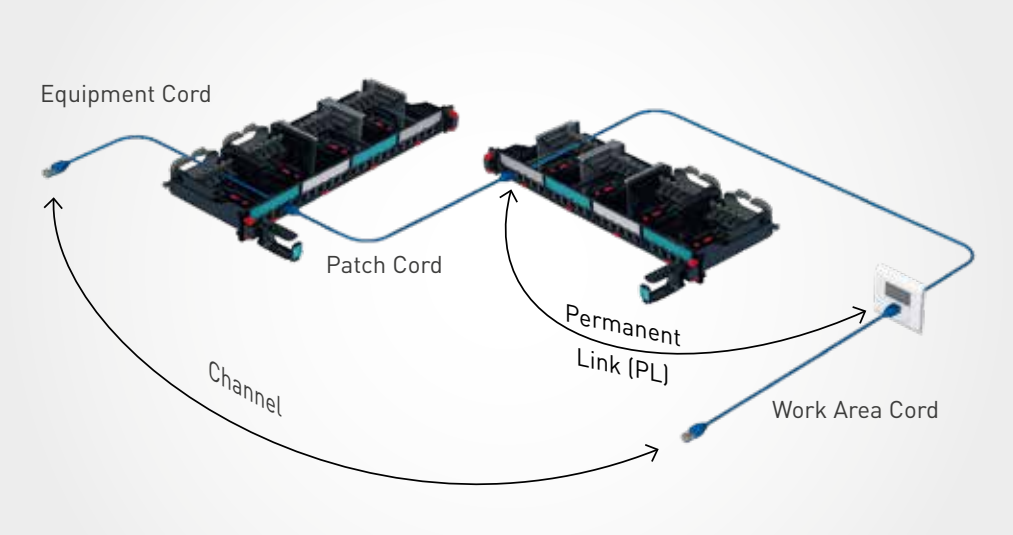
- The Fixed Connector: this is the female, also called a jack, that would be found in the patch panel or in the outlet
- The Free Connector: this is the male, also called a plug, that is used in cords

Until recently, a fixed cable of the Permanent Link could only be terminated on fixed connectors. This allowed testing of the permanent part of the cabling. Cords could then be connected on both sides to create a Channel to allow connection of the equipment.

Below is the basic configuration.



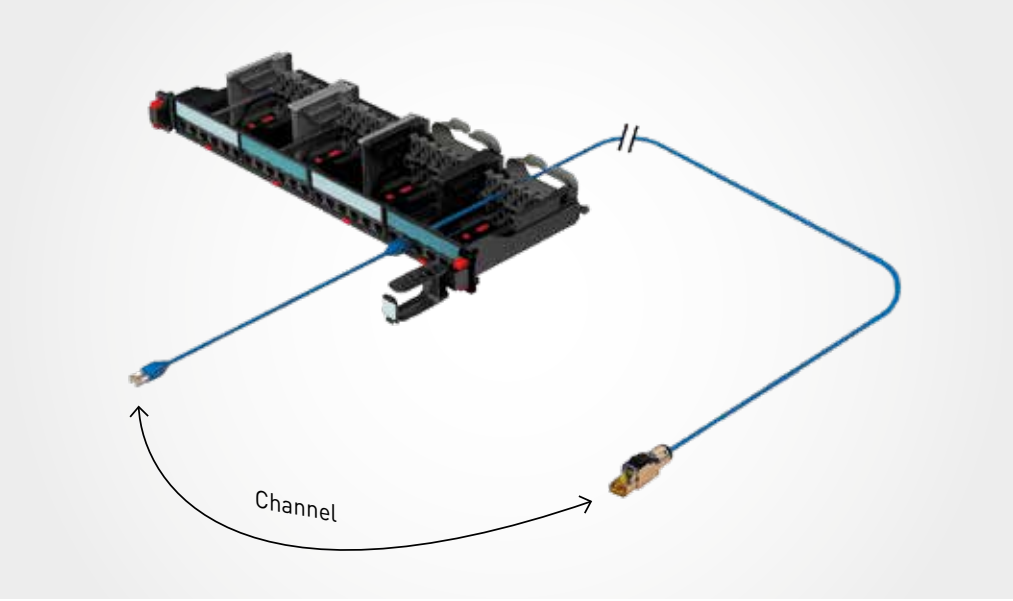
To provide better flexibility, the Channels were allowed up to 4 connectors as shows in the diagram below:



But they were never allowed fewer than the 2 connectors in the basic configuration.

The evolution of technologies has led to a growth of devices connected semi-permanently. This is generally in the false ceiling, and a connection is always done by a professional, rather than by anyone for typical outlets. Examples of such devices and Wi-Fi access points and IP cameras.

This leads to questions whether the mandatory outlet is justified: why not avoid it and connect a plug (free connector) at the end of the cable to directly attach the end device? This is called the Modular Plug Terminated Link (MPTL) and has been recently added as a recognized solution in the standards. Below is a diagram of an MPTL:



The MPTL requires a specific plug (free connector) of the same Category of the link. In exchange for lowering the flexibility which is not required in such application, it provides an increased reliability with fewer products, less space required, simplified compliance to fire reaction requirements, and last but not least, a cost saving.

Legrand field installable plugs for MPTL

Cat. 5e & Cat. 6 UTP
RJ 45 field plugs

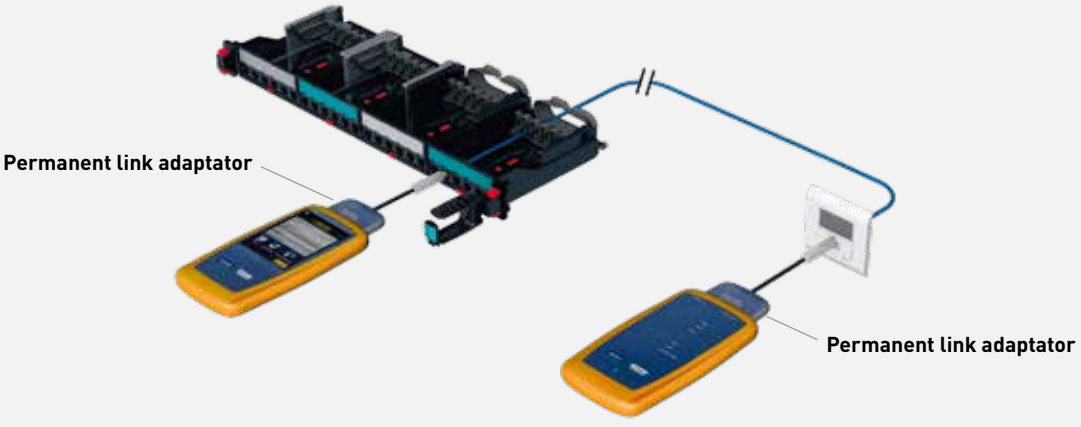
Cat. 5e & Cat. 6 FTP
RJ 45 field plugs

Cat. 6A STP toolless
RJ 45 field plug

Caution must be used when testing such links. It is not a Permanent Link and is not a Channel. It must be tested as an MPTL with the correct adaptors and test limits.

For certification of a new cabling, only Permanent Link, and now MPTL, are recognized.

Below is the diagram of the Permanent Link testing:



Below is the diagram of the MPTL testing:

Channel can be tested for verification only, before connection of the active equipment, but it is not a certification test as it's linked to the cords used.

CONCLUSION

Structured cabling standards are intended to provide inter-operability and flexibility in the communications infrastructure. Since technologies evolve, so do standards.

Customers should always consider using the latest products for the best life expectancy of the infrastructure.

They should also consider the recent architectures to provide solutions best adapted to their needs, such as the MPTL extremely well adapted for devices connected semi permanently.

Fiber considerations when migrating to 100 Gigabit Ethernet and higher

Multimode fiber systems have been the most cost-effective fiber solution to use in the data center because the transceivers are much less expensive than single-mode transceivers. Multimode transceivers use a vertical cavity surface emitting laser (VCSEL) light source, which is easy to manufacture and package. Multimode fiber systems have a shorter reach than single-mode systems, however most distances are less than 150 m; surveys have shown that more than 80% of data centers extend to 100 m or less. Although single-mode cable is less expensive, after factoring in the total system cost of multimode versus single-mode, multimode is still much less expensive.

Some common approaches used in data centers are summarized in Table 6. Each approach uses short-wavelength (850 nm) transmission over multimode fiber.

The fiber system should be designed around OM3 or better MMF if there are plans to support applications beyond 10 Gbps.

OM3 supports 10 GbE up to 300 m, but only supports 40 GbE up to 100 m. OM3 supports the 100GBASE-SR10 PMD up to 100 m but only supports 100GBASE-SR4 up to 70 m so that is another important consideration. OM4 supports 10 GbE up to 400 m, but only supports 40 GbE up to 150 meters. OM4 supports the 100GBASE-SR10 PMD up to 150 m but only supports 100GBASE-SR4 up to 100 m.

If planning to support 100 GbE and higher in the future, the channel cannot be designed for the maximum distances over which 10G can be supported. Always design for the application that has the most stringent requirements (usually the fastest data rates) even if the application is a future installation.

In addition to selecting the type of fiber, there are several other important considerations when selecting components for a fiber optic cabling system. These include channel insertion loss, polarity and alignment pins.

Channel Insertion Loss/Loss Budget

The channel insertion loss is made up of the insertion loss (IL) of the cable, specified as decibels per kilometer (dB/km), the insertion loss of all mated connector pairs and the insertion loss of splices in that channel. As can be seen in the Table 7, as the data rate increases from 10 Gbps to 40/100 Gbps, the total channel insertion loss or loss budget decreases noticeably.

Table 6: Common Data Center Approaches Using Short Wavelength Transmission

Data rate (Gbps)	IEEE standard	Fiber pairs	Wavelengths
25	Ratified Standard	1	1
40	Ratified Standard	4	1
	Non-Standard	1	2
		1	4
50	Ratified Standard	1	1
100	Ratified Standard	10	1
		4	1
		2	1
	Non-Standard	1	4
		1	2
	Draft Standard	1	1
200	Ratified Standard	4	1
	Draft Standard	2	1
400	Ratified Standard	4	2
		16	1
		8	1
	Draft Standard	4	1

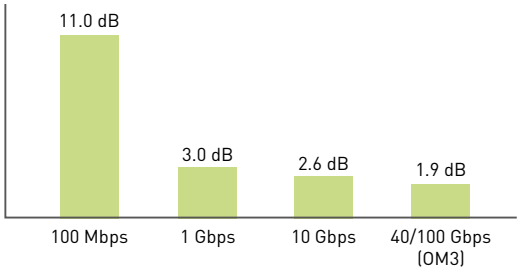
Table 7: Maximum Channel Insertion Loss for short wavelengths applications

	Application	Fiber type	Maximum distance	Maximum channel loss
2-core applications LC duplex or equivalent	10GBASE-SR	OM3	300 m	2.6dB
		OM4/OM5	400 m	2.6dB
	25GBASE-SR	OM3	70 m	1.8dB
		OM4/OM5	100 m	1.9dB
	40G-SWDM4[1]	OM3	240 m	2.1dB
		OM4	350 m	2.5dB
		OM5	440 m	2.5dB
	50GBASE-SR	OM3	70 m	1.8dB
		OM4/OM5	100 m	1.9dB
	100G-BIDI[1]	OM3	70 m	1.8dB
		OM4	100 m	1.9dB
		OM5	150 m	2.0dB
	100G-SWDM4[1]	OM3	70 m	1.8dB
		OM4	100 m	1.9dB
		OM5	150 m	2.0dB
4-core applications LC duplex or equivalent	100GBASE-SR2	OM3	70 m	1.8dB
		OM4/OM5	100 m	1.9dB
8-core applications Typically MPO	40GBASE-SR4	OM3	100 m	1.9dB
		OM4/OM5	150 m	1.5dB
	100GBASE-SR4	OM3	70 m	1.8dB
		OM4/OM5	100 m	1.9dB
	200GBASE-SR4	OM3	70 m	1.8dB
		OM4/OM5	100 m	1.9dB
	400G-BD4.2[1]	OM3	70 m	1.8dB
		OM4	100 m	1.9dB
		OM5	150 m	2.0dB
	400GBASE-SR4.2	OM3	70 m	1.8dB
		OM4	100 m	1.9dB
		OM5	150 m	2.0dB
16-core applications Typically MPO	400GBASE-SR8	OM3	70 m	1.8dB
		OM4/OM5	100 m	1.9dB
20-core applications Typically MPO	100GBASE-SR10	OM3	100 m	1.9dB
		OM4/OM5	150 m	1.5dB
32-core applications Typically MPO	400GBASE-SR16	OM3	70 m	1.9dB
		OM4/OM5	100 m	1.9dB

[1] Not an IEEE standard. Application available as multi-source agreement

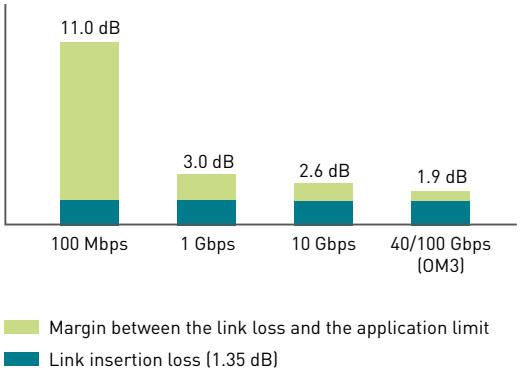
Understanding the impact of each component in the channel loss budget is extremely important when selecting cables and connectors. Often, the cable attenuation performance and bandwidth drive the design of the channel. The impact that a connector can have on the total channel budget can be significant.
The figure below shows the total loss budgets for a 100 m channel at different data rates common to current Ethernet applications. As data rates progress from 100 Mbps Ethernet-based systems to today's 10 Gbps Ethernet-based systems, the fiber optic loss budgets have shrunk considerably from 11 dB to 2.6dB. 40/100 Gbps Ethernet systems have an even smaller budget of 1.9 dB when using OM3 or 1.5dB when using OM4.

Total Channel Insertion Loss by Application



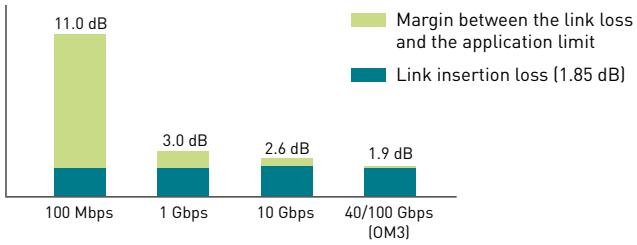
If we look at two channel insertion loss budget examples for 2 and 3 mated pairs, including the cable loss for a 100 m link at 850 nm, the importance of connector loss is apparent.
Using the standard loss for a multimode fiber cable (OM3/OM4, 850 nm) of 3 dB/km (ISO/IEC 11801 3rd Edition-Q2 2017) and an average of 0.50 dB loss per mated connector pair (standards allow up to a maximum 0.75 dB loss and up to 4 connections), the calculated loss for a 100 m channel with 2 mated connector pairs is 1.35 dB ((3.5db/km * 0.1km) + (0.5 * 2)). Applied to the loss budgets, as shown in the figure below, this is not significant for 100 Mbps systems. However, the insertion loss takes up a little more than half of the 10G budget and almost three-quarters of the 40/100 Gbps budget.

Channel Insertion Loss In a 100 M Channel with 2 Mated Connector Pairs



If we look at a 3-connector-pair channel, the loss budget rises to 1.85 dB ((3.5db/km * 0.1km) + (0.5 * 3)), as shown in the figure below. This is more than 70% of the 10 Gbps budget and almost the entire 40/100 Gbps budget. This would exceed the loss budget using OM4 for 150 m, which is 1.5 dB because of the longer distance, proving the insertion loss of a connector is very important.

Channel Insertion Loss In a 100 M Channel with 3 Mated Connector Pairs



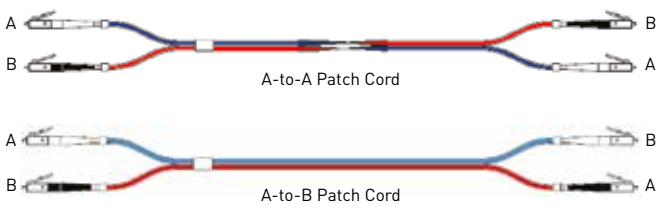
It is important to consider the trade-off. If the IL of one component can be reduced, there will be room for extra loss in another component. For example, if using OM4 at only 100 m instead of 150 m, the loss of the cable will be less because IL is directly related to distance (dB/km). This can make room for more mated connector pairs. However, all of the IL gain can easily be negated with inferior connector components.

Polarity

Don't forget to plan for the correct polarity. Maintaining correct polarity guarantees an optical path from the transmit port of one device to the receive port of another device, known as the polarity flip. There are several different methods to maintain polarity, but the different methods may not be interoperable. There are three methods depicted in the standard ISO/IEC 14763-2 "planning and installation"; methods A, B and C. There are other proprietary methods used by various manufacturers.
Each method requires a specific combination of components to maintain polarity. Assuming duplex signaling, using an MPO backbone cable, cassettes and patch cords, the following list shows the component options that are used in specific combinations for each of the polarity methods.

The options for components are:

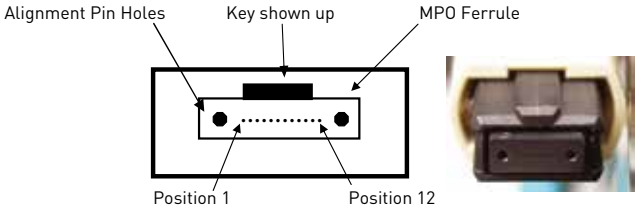
- MPO-to-MPO backbone cables: Type A, B or C
- MPO-to-LC cassettes: Method A or Method B
- Patch cords: Type A-to-A or Type A-to-B



For example, with duplex signaling, a Method A polarity scheme uses a Method A cassette, Type A trunk cable and a type A-to-B patch cord on one end of the channel and a type A-to-A patch cord on the other end. The transmit to receive flip occurs in the patch cord at one end. Method B uses a Method B cassette and trunk cable and an A-to-B patch cord at each end because the flip occurs in the cassette and trunk cable. Method C uses a Method A cassette with a Type C trunk cable and A-to-B patch cords at each end. The flip occurs in the trunk cable only.

Polarity becomes more complicated when migrating to 40/100 GbE because parallel transmission replaces duplex transmission. Parallel fiber optic links integrate multiple transmitters in one transmitter module, multiple fibers in fiber array connectors and multiple receivers in one receiver module. Multiple transmitters and receivers may also be integrated together in a transceiver module.
The three methods, A, B and C, are expanded in the ISO/IEC 14763-2 standard to include links that use parallel signaling in one row. Array connectors are keyed to maintain polarity. A keyed MPO connector is shown in the figure below.

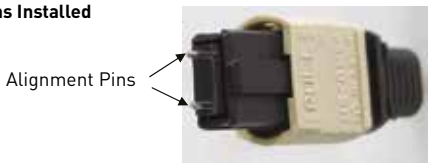
MPO Plug Fiber Positions Looking at the Ferrule End with Key Up



Alignment pins

When mating connector plugs that use alignment pins, like the MPO connector, it is critical that one plug is pinned and the other plug is unpinned. Because all known transceivers that accept MPO plugs are pinned, they accept only unpinned plugs.

MPO Connector With Pins Installed



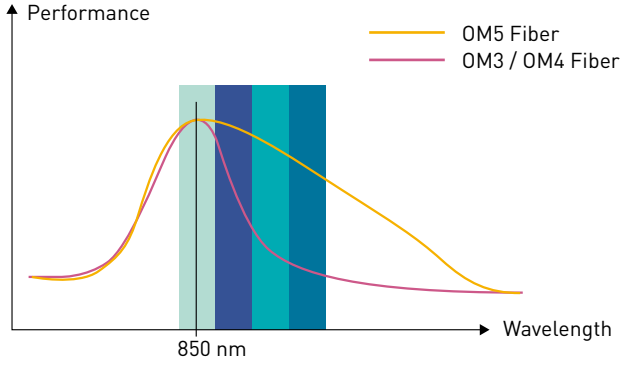
The pinned connector is typically located inside the panel to help protect the pins from being damaged (i.e. the fixed connector is pinned and the connector that is frequently removed and handled is unpinned). For example, cassettes are typically pinned and trunk cables are typically unpinned.

Consult the manufacturer since there may be exceptions required for your design.
If not properly cleaned, alignment pins can collect debris around the pins, resulting in the two components not mating correctly.

A new fiber

The wideband MMF TIA standard was approved for publication in the middle of 2016. The standard specifies high bandwidth 50 µm core diameter/125 µm cladding diameter, laser-optimized optical fiber that is optimized to enhance performance for single wavelength or multi-wavelength transmission systems with wavelengths in the vicinity of 850 nm to 950 nm. The actual operating band is from 850 nm to 953 nm. The effective modal bandwidth (EMB) for this new fiber is specified at the lower and upper wavelengths: 4700 MHz•km at 850 nm and 2470 MHz•km at 953 nm. ISO/IEC has assigned the OM5 designation for this type of fiber and it was ratified under IEC 60793-2-10 type A1a.4.

This is a significant standard for multimode fiber because it makes wavelength division multiplexing (WDM) possible over multimode fiber. Since the fiber is optimized for short wavelengths, the wavelength division multiplexing used over multimode fiber is commonly called short wavelength division multiplexing (SWDM). Up until now, WDM has only been used with single-mode fiber. WDM is important because it is one of four ways to increase the data rate: WDM, parallel transmission with multiple fibers, increased modulation and using multi- level coding.
To show how this new standard can influence fiber optic plant for current and in-progress Ethernet standards refer to Table 8. The current 40 GbE (40GBASE-SR4) standard, using short wavelength over multimode fiber (MMF), uses a channel rate of 10 Gbps with eight fibers; four fibers for transmission and four fibers for reception. Using OM5 that supports four wavelengths (in effect four channels) the four transmit fibers are reduced to one fiber, as are the receive fibers. The fiber optic cable plant is reduced from eight fibers to two. 100GbE is an even better example because the original standard released in 2010 (100GBASE-SR10) required a total of 20 fibers, 10 transmit and 10 receive, using a 10Gbps channel rate. A new 100GbE standard (100GBASE-SR4) was published in 2015 specifying a 25Gbps channel rate which allowed the fiber count to be reduced to a total of eight fibers; the same fiber count as 40GbE. This is an example of how increased modulation reduces the fiber count. Using SWDM with the new OM5 can reduce the fiber optic plant to two fibers for 100 GbE using a 25 Gbps channel rate. With the 50Gbps channel rate, it can allow 200Gbps on 2 cores, and with the future 100Gbps channel rate, it could allow 400Gbps on 2 cores.



As was mentioned, Phase I of the 400GbE (IEEE 802.3bs) standard ratified transmission over multimode using parallel transmission with a channel rate of 25 Gbps. This requires a total of 32 fibers. Employing SWDM over OM5 reduces the fiber count to 8 fibers, 25% of the number of fibers required in Phase I.

What's coming?

IEEE 802.3 has provided the 50Gbps channel rate, allowing 100Gbps on 4 cores and 200Gbps on 8 cores using parallel optics, and later on 400Gbps on 16 cores.
IEEE 802.3db working group has now started work on the 100Gbps channel rate which will be used to create the following applications:

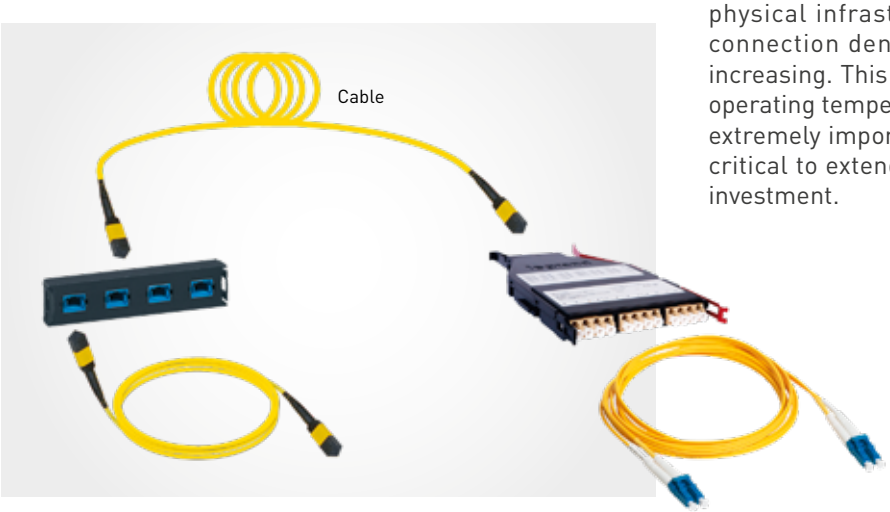
- 100Gbps on 2 cores
- 200Gbps on 4 cores
- 400Gbps on 8 cores

These are specifically designed for end-of-row cabling, with 2 distances: 50m and 100m variations.
In the meantime, a new architecture as developed in the active equipment: Breakout mode. This involves using a single MPO connection in a switch, which then is split into multiple connections with duplex connectors. The advantages are multiple:

- Fewer switch ports needed for a given number of devices connected.
- Fewer ports needed on the fiber patching
- Fewer cords needed for patching
- Lower connector attenuation than when using parallel-to-duplex (MPO-to-LC) cassettes on both sides.

An example is a current 200G port that can breakout into 4 duplex ports of 50Gbps each.
These new IEEE 802.3db applications are specifically designed to allow the breakout mode, for example allowing a 400Gbps port to breakout into 4 ports of 100G.

Example of cabling for Breakout mode:



This leads to a new cabling architecture, where instead of having the same connectors on both ends, would have an MPO/MTP connector at one end, and duplex connectors of type LC or equivalent on the other end. This architecture can allow the following evolutions on multimode fiber:

- 40Gbps to 4 x 10Gbps
- 100Gbps to 4 x 25Gbps
- 200Gbps to 4 x 50Gbps

Conclusion

Before selecting a product for your data center design, establish the fastest application your structured cabling will need to support. Multimode fiber systems are more common than single-mode systems for short distances because they are more cost-effective. Selecting OM4 will provide longer-distance support or more connections over shorter distances compared to OM3. And selecting OM5 will additionally ensure compatibility for new SWDM applications that allow the increase of data rates without increasing the number of fibers needed.

The type of connector is determined by the transmission; LC for duplex transmission and MPO/MTP® for parallel transmission. And new architectures take advantage of the breakout mode, allowing the reduction of ports on the switches.

Channel insertion loss is the foundation for design, so consider high-performance, low-loss components.

You will also need to consider the polarity method to be used and then select the correct components to support that method. If using array connectors for parallel transmission, consider which components require pins and which do not. The best option is to work with the manufacturer to make sure the correct components are selected.

Don't forget to put as much thought into designing your physical infrastructure as the structured cabling. The connection density in switches, servers and routers is increasing. This means more cable to manage and higher operating temperatures, making properly managed airflow extremely important. The correct infrastructure design is critical to extend the life of the network and protect your investment.

The next step in fiber connectors

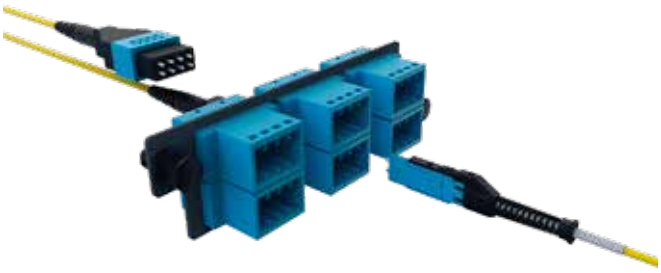
Fiber connectivity has gone through a couple of evolutions. First generation in data networking were the SC and the ST connectors. The next generation, providing higher density, where the Small Form Factor (SFF) duplex connectors. This was our introduction to the LC connector. The MPO came later for supporting parallel transmission. There were other fiber connectors in both the 1st generation and SFF footprint, however the ones mentioned have become the most common in data networks.

Data center growth and transceiver design that requires a duplex optical connector with a smaller footprint, than the LC, are driving a 3rd generation of duplex connectivity—very small form factor (VSFF) optical fiber connectors. These new VSFF connectors include the CS, SN and MDC. All are a push-pull style to make insertion and extraction easier. The CS was developed as a replacement for the LC connector enabling higher density. The SN fiber connector provides increased density over the CS and enables breakout at the transceiver. The MDC connector supports the highest density of the three, supports breakout at the transceiver and enables simple polarity reversal in the field.

Connector	Density in 1 RU (rack unit)	Comparison
LC	72-duplex ports / 144 fibers	Highest density available today
CS	168-duplex ports / 336-fibers	More than 2x LC density
SN	192-duplex ports / 384-fibers	Higher density than CS
MDC	216-ports / 432-fibers	Highest density; 3x LC density; polarity reversal

Along with these new VSFF connectors, new ways to break out parallel to duplex transmission is becoming available. Traditionally, breakout from a higher to a lower data rate was done with a cassette or a harness. Cassettes make management easier but add two connections to the channel. Harnesses only add one connection however, they are more difficult to manage than patch cords. New solutions in the market are providing options that offer the advantages of the cassette and harness in one—breakout to patch cords for easy management with only one connection added.

The example shown breaks out an 8-fiber trunk to four MDC connectors. This provides very high density with only one connection in the channel. Yes, you can have your cake and eat it too! Use of the MDC connector makes polarity easily reversable without the need for special tools. Polarity can be changed for both multimode and single-mode, which is usually not possible because of the angled polish.



Historically, equipment has driven the adoption of new connectors. With new breakout options, like the one shown here, both connectivity and the equipment manufacturers will drive market adoption.

Knowing the right questions to ask is the key. Technology is always evolving, inspiring new ideas and ways to do things. Keeping up with changes can be challenging and time consuming. You don't need to know every option available; you just need to ask the right questions to select the best connectivity for your application. Nothing is "future-proof" but making the right connectivity decisions lengthens the life of the structured cabling through several generations of equipment.

Cable fire ratings - Construction Projects Regulation (CPR) Applied to Structured Cabling

What is the CPR?

The Construction Projects Regulation (CPR) is a European law published in 2011, with a classification ratified in 2016, to impose minimum fire performance to products installed permanently in buildings. It covers, among other items, the communications cables fixed in the building, but not the removable items such as patch cords and user cords. Vendors are required to comply since July 1st, 2017 and the fire rating must be identified on the cable packaging along with the CE mark. The associated declaration of performance (DoP) must be made available to customers.

The EU regulation enforcing the standard by law is applicable to all European Economic Area (E.E.A.) member states: Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

It also applies in the countries voluntarily participating to be part of the single market: Iceland, Liechtenstein, Norway and Switzerland. In addition, four other countries are E.U. candidates and in the process of incorporating EU legislation into national law: Montenegro, Macedonia, Serbia and Albania. Finally, Turkey is an associate member, voluntarily following EU regulations.

Why do we care since we already have LSZH?

Previously, cables sold in Europe were classified in 2 types depending on their outer jacket:

• PVC: Poly Vinyl Chloride. A type of plastic that, in case of fire, usually burns very fast and emits large amounts of thick and irritating smoke. Translation: fire spreading quickly, people can't see the exit because of the smoke, and can't breathe because that smoke is burning their lungs.

• LSZH: Low Smoke Zero Halogens. The "Low Smoke" means that people should be able to still see in case of fire. Fluorine, Chlorine, Bromine, Iodine and Astatine are highly reactive in case of fire and are the principal irritating components of the cable sheaths. The "Zero Halogens" means avoiding them and thus cables are less irritating to the human lungs in case of fire.

The problem is that these terms imply only the type of material of the jacket, but not the conductor isolation material, and do not impose any actual fire resistance of the cable. Some manufacturers chose to comply with certain IEC fire rating tests, but those were insufficient and not mandatory.
A second issue was discovered more recently with less reputable suppliers: non-compliance. Some cables claimed to meet the ratings, but when tested they failed miserably. So, there was a necessity to also introduce a solution to guarantee the rating rather than simply rely on manufacturer claims.

Details of the CPR

The CPR now classifies cables according to the characteristics of flame propagation and heat release, as well as additional characteristics: smoke production, smoke acidity, and flaming particles. Then it also introduces various levels of conformity control over the results. As an example, a CPR classification is written "D_{CA} s2 d2 a1". D_{CA} is the Euroclass and "s2 d2 a1" are additional criteria.
The classification consists of 7 Euroclasses which define the fire reaction performance. Below is a table summarizing the classification:

TESTING AND LEVEL OF CONTROL:

		A_{CA}	$B1_{CA}$	$B2_{CA}$	C_{CA}	D_{CA}	E_{CA}	F_{CA}
Euro classification	Gross heat of combustion	yes						
	Flame propagation		yes	yes	yes	yes	yes	no
	Heat release		yes	yes	yes	yes	no	no
Additional criteria	Smoke production, flaming droplets, smoke acidity		yes	yes	yes	yes	no	no
Control of compliance	Type Testing by independent lab	yes	yes	yes	yes	yes	yes	no
	Production sampling by certification body	yes	yes	yes	yes	no	no	no

Cable fire ratings - Construction Projects Regulation (CPR) Applied to Structured Cabling

EXPLANATION OF THE EUROCLASSES:

Euroclass	Reaction to fire	Comments
A_{CA}	Non combustible	It is near-impossible to produce non-combustible communication cable.
$B1_{CA}$	Various level of flame propagation and heat release	D_{CA} is the lowest cable type with all aspect tested and certified by an independent laboratory. Higher classes offer improved resistance to flame propagation and heat release but their additional criteria could be identical.
$B2_{CA}$		
C_{CA}		
D_{CA}		
E_{CA}	Minimum flame propagation testing	Heat release is not tested. Additional requirements are not tested, so the spread of fire is controlled, but the evacuation of people is limited due to toxic fumes. This is the first level of cable to require independent testing.
F_{CA}	No testing	Offers absolutely no guarantees. Should be avoided.

DEFINITIONS OF THE ADDITIONAL CRITERIA:

Smoke production	Performance
s1	Very low smoke production
s1a	Very low smoke production and high transmittance
s1b	Very low smoke production and medium transmittance
s2	Average smoke production
s3	No performance guaranteed

Particles / Droplets	Performance
d0	No droplets / flaming particles
d1	Low droplets / flaming particles
d2	No performance guaranteed

Smoke acidity	Performance
a1	Very low smoke acidity
a2	Low smoke acidity
a3	No performance guaranteed

These additional criteria are added after the letter of the Euroclass in order s, d, a. and they allow for more than 200 combinations. For obvious reasons, most will not exist, and only the most useful ones will be used.

It is important to understand that the lowest rating in each type means that the product actually does not meet the requirements.

The smoke production can impair visibility and restrict people from finding the exit. If the cable is compliant to "s1", then an additional test of transmittance measure exactly how far a person can see. This factor can be important in fire escape routes, but less in closed rooms where the exit is known.

The acidity is the primary danger in case of evacuation and is the main cause of death.as it seriously impairs breathing. However, it's only an important factor with large quantities of cables in area where people cannot exit rapidly.
The flaming particles pose two risks: spreading the fire to other areas and burning people nearby. So, when contained inside cable management, this aspect has far lower risk than with apparent cables.

How to choose?

The European Union imposes the cables to comply with this classification, but it does not impose any specific requirement. This is the decision of each country and will depend on building types. Some countries have already defined their requirements, but for the others, the advice below can help designers make informed decisions.

If it were possible, all installations would use only the highest fire resistance possible. Unfortunately, there are always tradeoffs to obtain an optimal balance between safety, ease of installation and cost.

Euroclass A_{CA} will most likely not exist in communication cables.
Euroclass $B1_{CA}$ and $B2_{CA}$ are generally limited to "protected" emergency exits. These are areas used strictly for emergency and with no burning material inside. The only cables entering this space are to connect fire safety equipment such as fire escape signs or fire detection. Any other cables crossing that space should be enclosed in a fire rated pathway.
Euroclass C_{CA} is the first level to require regular product sampling by a certification body, so the cable not only has added cost of manufacturing but also cost of control. This can be justified for high density public areas, or when mandated by law.
Euroclass D_{CA}, offers adequate reaction to fire with a certification of compliance from an independent lab. This is the most common cable.

At the bottom of the list, Euroclass F_{CA} is not guaranteed for anything, and Euroclass E_{CA}, although tested for fire propagation, is not tested for heat or for any additional criteria. These cannot be recommended, although E_{CA} could be used where a very limited quantity of cables is installed as these would have a low impact in case of fire.

Then additional criteria must be decided. In Europe, the majority of cables are installed either in the false ceiling, in walls or in closed wall mount containment. This is an important aspect for selecting the right options. The smoke should be controlled but it's not so critical inmost areas since there are already barriers.
We can generally see the D_{CA} associated with the "s2", and C_{CA} and above associated with the "s1" requirement. The "s1a" and "s1b" are generally applied only in very specific contained fire exits and associated to the highest Euroclasses.

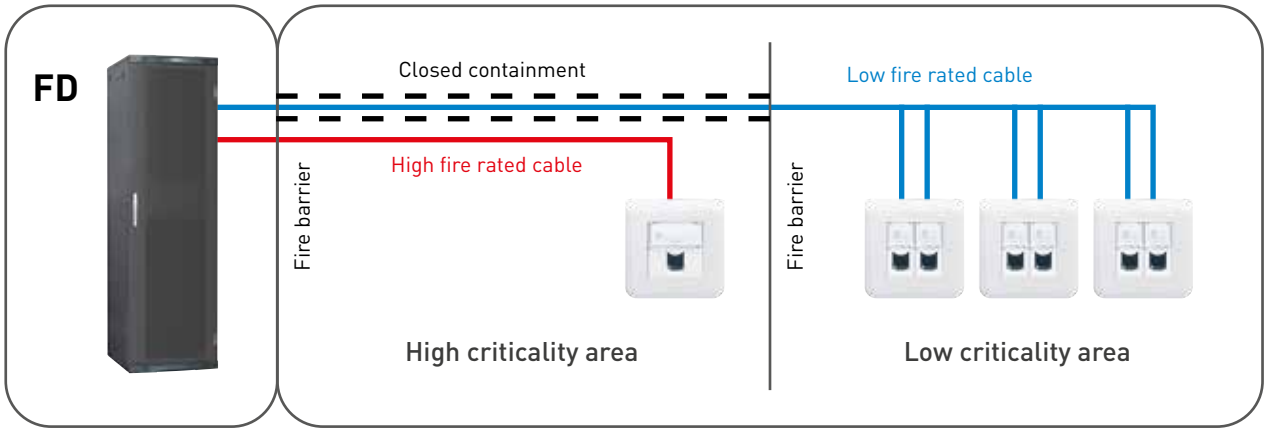
While the cables are not directly inside the user space, the particles have marginal influence on the ability for people to evacuate. These could have an impact in an open containment directly above a main exit corridor where flaming droplets could pose a threat, but in most cases, "d2" is perfectly acceptable. If the cables are crossing a critical area, the simplest is to enclose them in fire resistant containment for that area.

Acidity: it's obvious that a single cable enclosed in a conduit does not have the same effect as a bundle on an open cable tray in a corridor. The general market acceptance is that some acidity is tolerated for low quantity of cables in conduits in residential but is never allowed for any common areas or public buildings. "a1" is the only safe choice if acidity needs to be controlled.

Design

The CPR is a European regulation to categorize cables according to their reaction to fire. Each country in E.U. can define its own requirements for each type of building based on the classification provided.

In countries where no specification is imposed, it is up to the designers to lead the industry in providing secure installations, allowing people to safely exit building in case of fire.



Unlike electrical cables, data cables cannot be spliced, so it's impossible to have a single circuit with various fire ratings according to areas crossed. It could seem simplest to always use the cable with the highest fire rating for the complete installation, but this will have significant impacts on cost and installation methods. The most practical solution is to choose the lowest acceptable rated cable for most of the project, then adapt to specific cases such as containment when crossing a sensitive area or specific cables only for certain needs. A smarter design can improve both costs and safety.

PoE standards and architecture

Standards

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

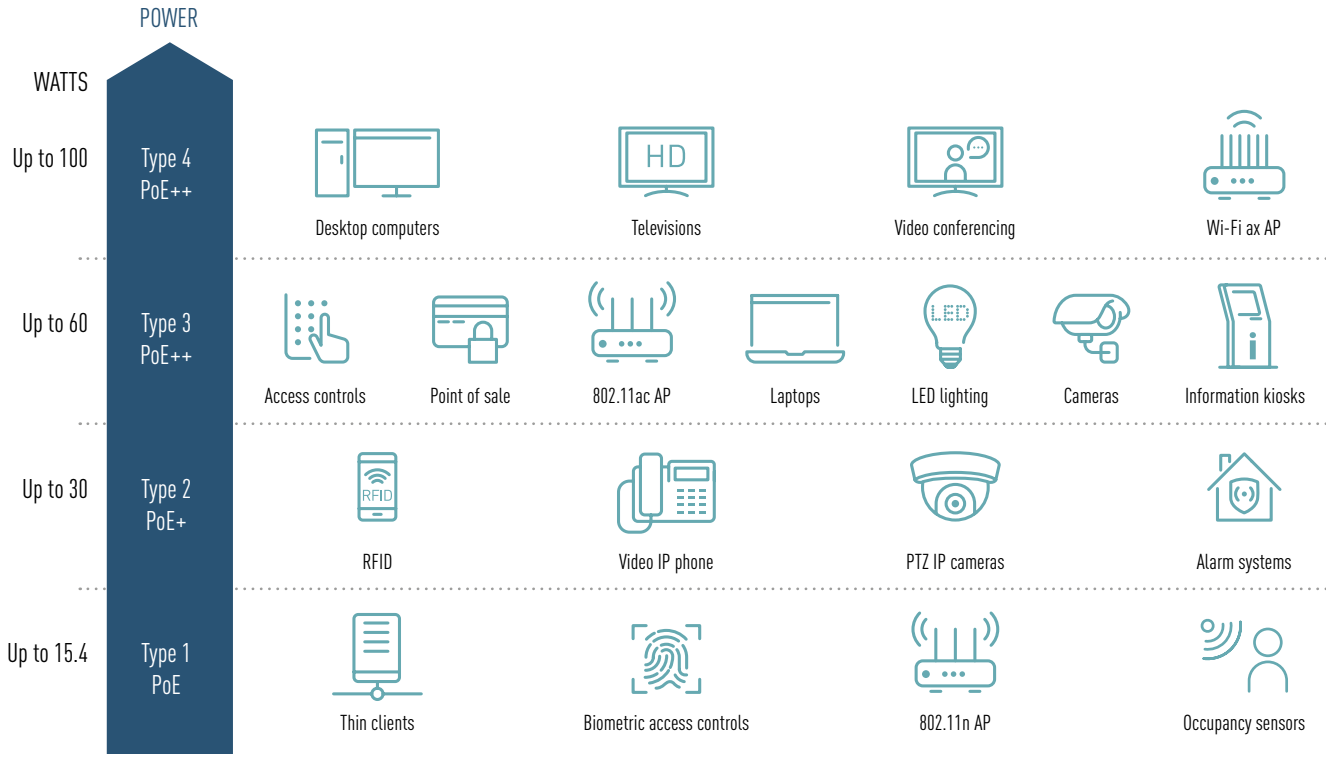
The IEEE sets the standard for Power over Ethernet (PoE) which allows for the simultaneous transmission of data and low-voltage power over Ethernet cabling.

With the ratification of 4-pair PoE, 802.3bt, the latest IEEE standard allow up to almost 100 Watts of DC power to be delivered from the power source equipment alongside data transmissions in a single category cable.

STANDARDS AND APPLICATIONS

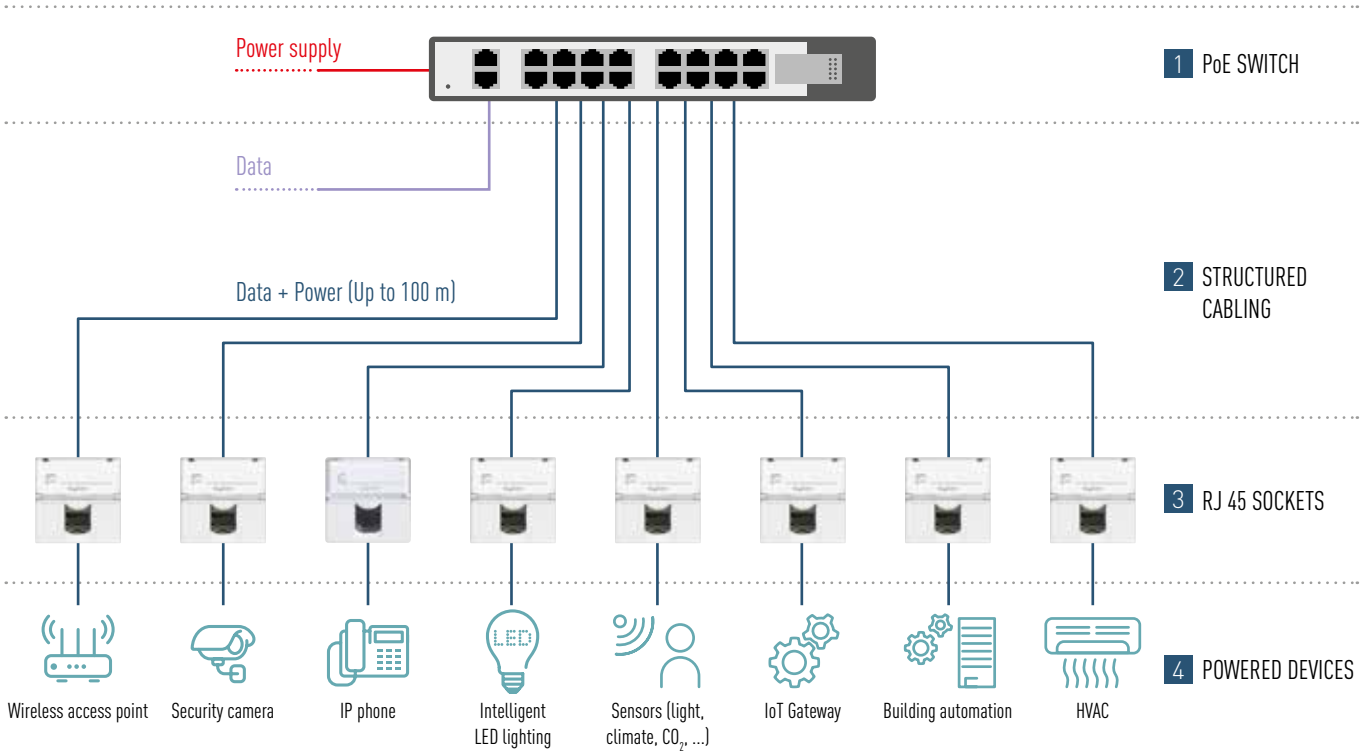
Organisation/standard	Watts from power source equipment
IEEE 802.3af 2-pair PoE	Up to 15.4 W
IEEE 802.3at 2-pair PoE+	Up to 30 W
IEEE 802.3bt (Type 3) 4-pair PoE	Up to 60 W
IEEE 802.3bt (Type 4) 4-pair PoE	90 W

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



Architecture

BUILDING SYSTEMS ARE MOVING TO A SINGLE IP NETWORK



1 PoE SWITCH

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

2 STRUCTURED CABLING

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

3 RJ 45 SOCKETS

Universal RJ 45 socket to connect devices.

4 POWERED DEVICES

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

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

Compliance of the cabling to PoE

The international installation standard ISO/IEC 14763-2 imposes consideration of PoE for any new installation.

It defines three Categories:

Category	I_c - average	i_c	Controls required during...	
			attachment of remote powering equipment	planning of subsequent cabling installation
RP1	⩽ 212 mA	⩽ 500 mA	Yes	Yes
RP2	> 212 mA < 500 mA	⩽ 500 mA	Yes	Yes
RP3	-	⩽ 500 mA	No	Yes

The infrastructure must be of type RP3 to comply to residential, commercial and industrial environments.

"For installation of cabling in accordance with ISO/IEC 11801-2, ISO/IEC 11801-3, ISO/IEC 11801-4 and ISO/IEC 11801-6, the planning, installation and administration requirements of Category RP3 shall be applied."

This means that it allows the maximum PoE (Type 4 90w) on 100% of the links without overheating and without disrupting the Ethernet signal.

In order achieve the RP3 category, multiple heat calculations must be made considering the environment temperature, types of cables, type of cable management, the number of cables per bundles, shape of the bundles and separation of the bundles. This is then used to calculate the maximum achievable distance of the channels at the estimated cable temperature.

Legrand has made the PoE guide for simplified installation conditions by making some assumptions. Following this guide provides guaranteed distances and compliance to RP3 Category.
As a reminder, all PoE assumption and calculations must be documented and kept in the technical specifications for reference in future additions to the cabling.

WANT TO KNOW MORE ABOUT PoE AND INCREASE THE POWER OF YOUR NETWORK?

CONTACT YOUR LOCAL SALES REP TO GET OUR PoE GUIDE!

Structured cabling: the Legrand 25-year application warranty

Almost all manufacturers now offer their warranty on the structured cabling systems. Because these warranties can have significant difference, and with promises ranging from 15 years to 25 years or even "lifetime", it can be complicated for the end user to understand the concept.

What the warranty really means

The duration of the warranty is actually the least important part of the contract. Anyone can assume that a warranty above 15 years simply means that the manufacturer trusts his product. In fact, products are only a part of the warranty, but not the main aspect. It's actually about creating a trust relationship between the end user and the manufacturer. It's about the manufacturer making the following statement: "If you choose my products, I will ensure that everything functions properly so that you don't have to worry about any risks." Now let's look at what needs to be covered.

> "IF YOU CHOOSE MY PRODUCTS, I WILL ENSURE THAT EVERYTHING FUNCTIONS PROPERLY SO THAT YOU DON'T HAVE TO WORRY ABOUT ANY RISKS."

Actors

Since the objective is for the end user to obtain support from the manufacturer, he must be the beneficiary of the contract. The installation company can and must be stated in the contract but can be neither the benefactor nor the beneficiary. In either of those two cases, the end user would lose the relationship with the manufacturer.

Questions to ask about the manufacturer

How long has the manufacturer been in existence? Will that company still exist in 25 years to honor the warranty? Does the company have local legal representation in the country to support this warranty? And do they have the sufficient financial strength in case of warranty claim?

The end user should therefore first verify the capacity of the manufacturer to honor that warranty based on the size of company, historical background, and reputation.

What about the labor?

The best of products cannot guarantee any performance unless the installation is done in the proper way. For this reason, manufacturers have created a training and certification program for installers.

It generally includes hands-on product practices, but most important, it covers the standards and rules of installation. This ensures the manufacturer that his products will be installed according to best practices and therefore offer the optimal performance. And by having the tight relationship with the installer, the manufacturer is aware of the progress of the installation and may make site visits and on-site support.

> THE COMMON PERFORMANCE WARRANTY THEREFORE LEAVES SIGNIFICANT RESPONSIBILITY ON THE END USER

Generally, each person having passed the training receives a certificate of success, and the company obtains a "Certified Installer" certificate. It is not uncommon for end users to verify these documents during the tender process.
In this sense, by requesting a warranty, the end user is actually ensuring the right technical support as well as project control from the manufacturer.

Local support

Local support is a critical aspect of a warranty program. In case of technical problem, how long will it take the manufacturer to visit the site? What legal rights does the end user have when he received a warranty from an overseas supplier without a local office. In most countries, the company legally responsible is the importer, which might be the distributor and not the manufacturer. The end user should always consider how he will be able to communicate with the manufacturer, how he'll obtain the right support, and what means he may have to protect his interests in case of disagreement.

The application warranty

The most common warranty is the Performance Warranty. In this version, the manufacturer ensures that the installer is properly trained, and request him to sign a contract where he confirms that he has followed the proper methods.

A very simplistic explanation of this warranty is the following:

- The products are all compliant
- The installation is compliant
- The performance of the links is compliant (Class EA for example)

At first glance this may seem sufficient, but although this does confirm the confidence of the manufacturer in his products and in the installation from the installer, it may not actually correspond to the expectations of the customer. Here are some details not covered:

- In fiber, the links are only required to meet standard values, which may not actually allow the applications expected. For example, multimode OM4 links of 3 connectors with Insertion Loss 2.25dB are perfectly compliant to standards, but none of the recent applications will function due to a budget limited to around 1.8dB.

- In copper, a Channel is defined for 100m maximum. But this is only at 20°C. As temperature increases, due to environment or to PoE, performance degrades. If the link no longer functions because the temperature increased, the manufacturer does not consider this a defect and will remind the customer that he's responsible for respecting standards during operations. The customer would therefore be expected to either maintain the temperature at 20°C, or to have designed with shorter links to compensate for temperature.

The common Performance Warranty therefore leaves significant responsibility on the end user. For this reason, Legrand has innovated with a 25-year Application Warranty. It's intended to ensure the customer that not only everything is compliant, but also that all applications will function on the system.

Here are the key features:

FIBER

Legrand supervises the design and architecture to ensure that all the fiber links have adequate lengths to support the applications. Then the standard test limit used for testing are replaced with far stricter limits not only reflecting the superior performance of Legrand products, but also assuring all the requested applications.

A list of applications is made available to the customer.

COPPER

The temperature has never been such an issue until the appearance of PoE. Sending power in a cable always creates heat, which in the case of PoE, could increase the temperature of more than 30°C. The installation standards provide all necessary information to ensure that the applications still function under PoE. But in some cases, the customer may need to assess the existing power through the cables for every new connection of a device. This can be extremely complex to implement in the operations processes. Below is a table of the Remote Powering Categories as defined in the International installation standard ISO/IEC 14763-2:

Category	I_c - average	i_c	Controls required during...	
			attachment of remote powering equipment	planning of subsequent cabling installation
RP1	⩽ 212 mA	⩽ 500 mA	Yes	Yes
RP2	> 212 mA < 500 mA	⩽ 500 mA	Yes	Yes
RP3	-	⩽ 500 mA	No	Yes

Compliance to the ISO/IEC 11801 series requires an installation compliant to ISO/IEC 14763-3, which mandates compliance to Category RP3.

This allows the maximum PoE (Type 4 90w) on 100% of the links without overheating and without disrupting the Ethernet signal, but most of all, without the need to control during connection of devices.

In order achieve the RP3 category, multiple heat calculations must be made considering the environment temperature, types of cables, type of cable management, the number of cables per bundles, shape of the bundles and separation of the bundles. This is then used to calculate the maximum achievable distance of the channels at the estimated cable temperature.

> THE CUSTOMER MAY NEED TO ASSESS THE EXISTING POWER THROUGH THE CABLES FOR EVERY NEW CONNECTION OF A DEVICE

This can be quite a challenging work, so Legrand has made a guide for simplified installation conditions by making some assumptions. Following this guide provides guaranteed distances and compliance to RP3 Category.

As part of the Application Warranty, Legrand provides the customer with the initial installation conditions so that the installer can provide a compliant installation. This information is recorded as part of the warranty, and all measurements are verified to comply to stated lengths. This means that Legrand is guaranteeing all applications, including PoE on the structured cabling, as part of the 25-year Application Warranty.

Legrand is therefore able to remove this responsibility from the customer and include it in the warranty.

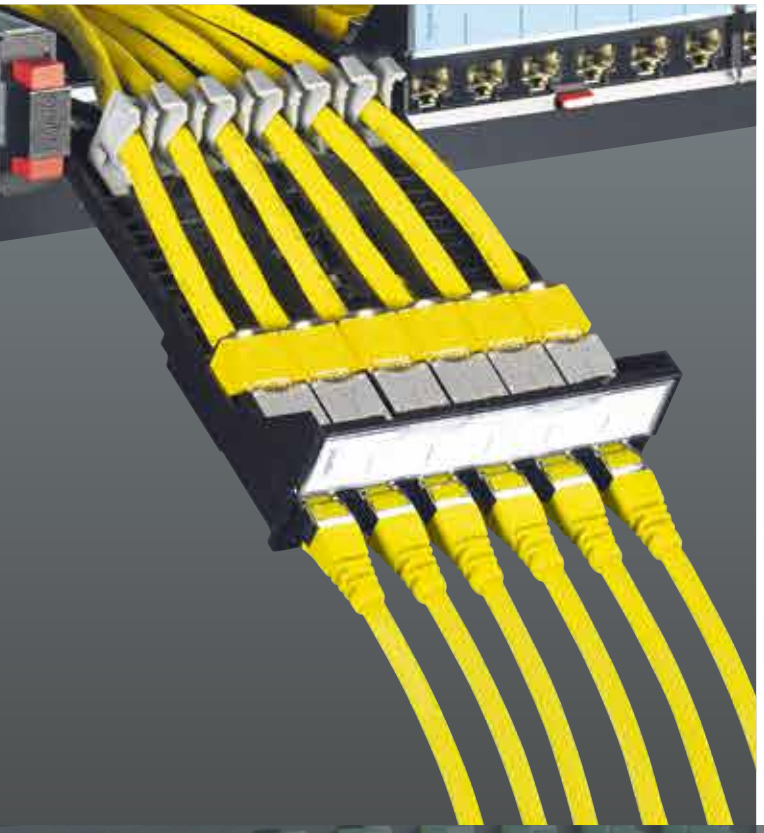
The customer can then be confident that all stated applications function on the copper cabling, including PoE, if the environment remains withing the assumptions stated.

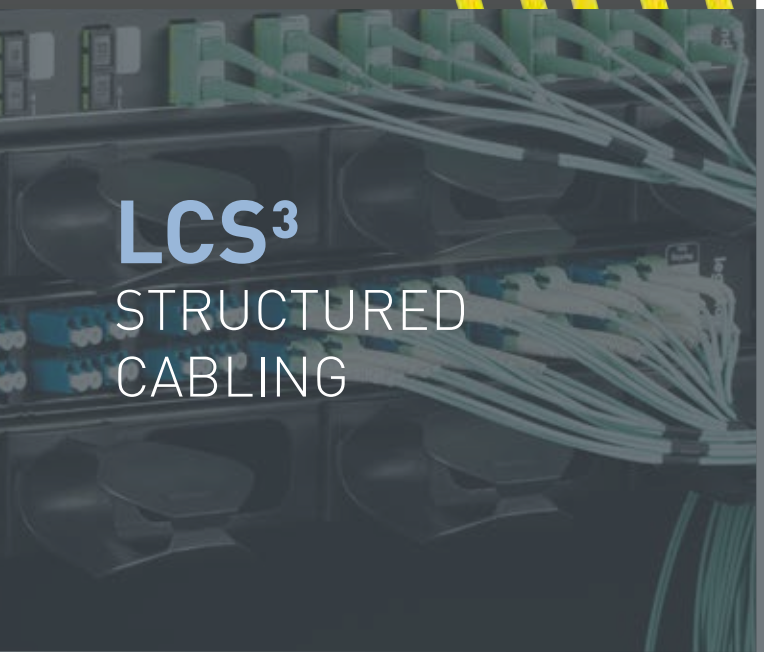
> LEGRAND IS GUARANTEEING ALL APPLICATIONS, INCLUDING PoE ON THE STRUCTURED CABLING, AS PART OF THE 25-YEAR APPLICATION WARRANTY

Conclusion

Warranties are not all alike. The customer should check the details such as the local presence and reliability of the manufacturer, and most important, the warranty coverage.

The Legrand 25-year Application Warranty goes far beyond the traditional Performance Warranties and offers what's really important to the customer: peace of mind.





LCS³
STRUCTURED CABLING

Selection charts

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LCS³
connectivity solutions

LCS³ Copper

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Cat. 8
LCS³ patch panels

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Cat. 6
LCS³ cables, cords and RJ 45 sockets

LCS³ Fiber optic

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LCS³ cables and preterminated links

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LCS³ pigtails, case and quick-connect connectors

Audio/video system

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Multiparticipant HDMI projection and MediaHub

Linkeo Enclosures

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Network cabinets

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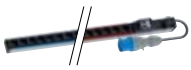
Wall-mounting cabinets and accessories

LCS³ Energy distribution



P. 146
Zero-U Basic PDUs

NEW PRODUCTS

LCS³ copper system

PoE Ethernet tablet switches, 5 ports :
- with EU power supply cord
- with BS power supply cord

(p. 126)

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Linkeo enclosures

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LCS³ Power Distribution Units

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Cat. 8
LCS³ connector, cables and cords

P. 110
Cat. 6A
LCS³ patch panels and connectors

P. 112
Cat. 6A
LCS³ cables, cords and RJ 45 sockets

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Cat. 6
LCS³ patch panels and connectors

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Cat. 5e
LCS³ patch panels and connectors

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Cat. 5e
LCS³ cables, cords and RJ 45 sockets

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PoE WAP/switches

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Doublers, adaptors and accessories

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LCS³ 19" fiber optic drawers and blocks

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LCS³ High Density panels, slim cassettes, cassettes and patching kits

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LCS³
patch cords and feedthrough sockets

P. 137
HDMI and HD15 sockets, HDMI extender

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Jack, RCA and XLR sockets, loudspeaker sockets

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Cords and adaptors

P. 140
USB Type-C adaptors and cords, data cords, data sockets and Type-A extender

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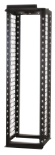
Accessories for server cabinets and cabling cabinets

P. 145
19" accessories



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Cabling openrack and accessories

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1U/2U horizontal Basic PDUs

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1U Basic PDUs

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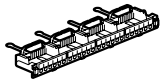
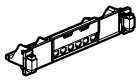
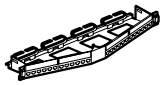
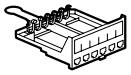
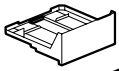
PDUs to be equipped and accessories

Legrand cabling system, LCS³ copper selection chart

patch panels and connectors

			Cat. 8	Cat. 6A	Cat. 6	Cat. 5e
LCS³ 1U 19" FLAT PATCH PANELS						
	1U patch panels equipped with 24 connectors	STP	033782	033772	033762	-
		UTP	-	033770	033760	033750
		FTP	-	-	033761	033751
	1U patch panels to be equipped	With cassette	033790	033790	033790	033790
		Without cassette	033791	033791	033791	033791
	1U High Density patch panel to be equipped with 48 ports		-	033793	033793	033793
LCS³ 1U 10" FLAT PATCH PANELS						
	1U 10"patch panels to be equipped	Up to 6 connectors	033798	033798	033798	033798
		Up to 12 connectors	033799	033799	033799	033799
LCS³ 1U 19" ANGLED PATCH PANELS						
	1U angled patch panel to be equipped		033792	033792	033792	033792
	1U High Density angled patch panel to be equipped		-	033794	033794	033794
LCS³ RJ 45 CONNECTORS AND CASSETTES TO BE EQUIPPED						
	6 RJ 45 connectors for flat and angled panel	STP	033785	033775	033765	-
		UTP	-	033773	033763	033753
		FTP	-	-	033764	033754
	Cassette for flat panels to be equipped		033755	033755	033755	033755
	Cassette with shutters for flat panels to be equipped		033766	033766	033766	033766
	High Density cassette for flat panels to be equipped		-	033795	033795	033795
ACCESSORIES						
	Cord guide		033759			
	Blanking cassette		033757			
	Port blanking modules		033756			
	Cover		033758			

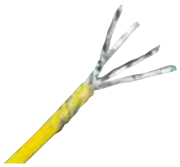
Legrand cabling system, LCS³ copper selection chart

telephone patch panels, PoE switches and Wi-Fi Access Point

LCS³ 1U 19" TELEPHONE PATCH PANEL			
	1 U telephone patch panel 50 ports 110 connect		033579
PoE SWITCHES			
	Tablet PoE Gigabit switches - non manageable	6 ports (4 PoE+ RJ 45 outputs) - EU power supply cord	033493
		5 RJ 45 ports (4 PoE+ RJ 45 outputs) - EU power supply cord	413111
		5 RJ 45 ports (4 PoE+ RJ 45 outputs) - BS power supply cord	413113
	19" PoE Gigabit switches - manageable	10 RJ 45 ports (8 PoE+ RJ 45 outputs) - EU power supply cord	033490
		26 RJ 45 ports (24 PoE+ RJ 45 outputs) - EU power supply cord	033492
PoE WI-FI ACCESS POINT			
	PoE Wi-Fi Access Point		033523

Legrand cabling system, LCS³ copper selection chart

patch panels and connectors

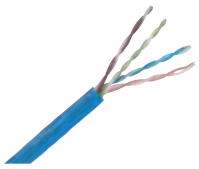
LCS³ COPPER CABLES						
						
	category 8.1 (aqua)	category 6_A/7 (black)	category 6_A/7 (yellow)	category 6_A (yellow)		
	S/FTP	S/FTP outdoor	S/FTP	F/FTP	F/UTP	
	4 pairs	4 pairs	4 pairs	4 pairs	4 pairs	
						
B2ca	-	-	032882	-	-	
Cca	-	-	032849	032883	-	
Dca	033788	033890**	032777	032799	032778	

*doos van 305mtr, ** Eca kabel

LCS³ PATCHCABLES									
									
Length (m)	category 8	category 6_A							
	S/FTP	S/FTP			S/FTP High density	S/FTP	F/UTP		
	LSZH Aqua RAL 6027	PVC Yellow **RAL 1018**	LSZH Red **RAL 3020**	LSZH Green **RAL 6026**	LSZH Yellow **RAL 1018**	PVC Blue **RAL 5015**	PVC Blue **RAL 5015**	LSZH Red **RAL 3020**	
0,5	-	051816	-	-	051550	-	051815	-	
1	-	051780	051870	051866	051551	051752	051762	051854	
2	033703	051781	051871	051867	051552	051753	051763	051855	
3	033704	051782	051872	051868	051553	051754	051764	051856	
5	-	051783	051873	051869	051554	051755	051765	051857	
8	-	-	-	-	-	-	-	-	
10	-	-	-	-	-	-	-	-	

Legrand cabling system, LCS³ copper selection chart

telephone patch panels, PoE switches and Wi-Fi Access Point

					
	category 6_A (yellow)		category 6 (blue)		category 5e
	U/FTP	U/UTP	F/UTP	U/UTP	U/UTP
	4 pairs	4 pairs	4 pairs	4 pairs	4 pairs
					
	-	032838	-	032879	-
	032884	032828	-	032886*	-
	-	032787	032856* 032756	032754* 032861	032750* 032853

								
	category 6						category 5e	Accessories
	F/UTP	U/UTP			F/UTP High density	U/UTP High density	F/UTP	U/UTP	Kit for marking Per 200 pieces, various colours
	LSZH Green **RAL 6026**	PVC Blue **RAL 5015**	LSZH Red **RAL 3020**	LSZH Green **RAL 6026**	PVC Blue **RAL 5015**	PVC Blue **RAL 5015**	PVC Grey **RAL 7035**	PVC Grey **RAL 7035**	
	-	051818	-	-	051540	051545	051814	051817	
	051850	051772	051862	051858	051541	051546	051640	051636	
	051851	051773	051863	051859	051542	051547	051641	051637	
	051852	051774	051864	051860	051543	051548	051642	051638	051890
	051853	051775	051865	051861	051544	051549	051643	051639	
	-	-	-	-	-	-	-	-	
	-	-	-	-	-	-	-	-	

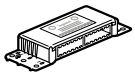
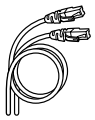
Legrand cabling system, LCS³ copper selection chart

RJ 45 sockets

WHITE MOSAIC RANGE RJ 45 SOCKETS			Cat. 6A	Cat. 6	Cat. 5e
	1 module	**STP**	076573	076563	-
		UTP	076571	076561	076551
		FTP	-	076562	076552
	2 modules	**STP**	076576	076566	-
		UTP	076574	076564	076554
		FTP	-	076565	076555
	2 x 45° tilted modules	**STP**	076508	076507	-
		UTP	076509	076503	076501
		FTP	-	076505	-
	90° socket	**STP**	-	076593	-
		FTP	-	076592	-
	Antimicrobial	**STP**	076584	076583	-
		UTP	-	076581	-
		FTP	-	076582	-
	Controlled access	**STP**	076599	076596	-
		UTP	076590	076594	076597
		FTP	-	076595	076598
	Green flap	**STP**	076524	-	-
		UTP	076526	-	-
		FTP	-	076522	-
	Orange flap	**STP**	076525	-	-
		UTP	076527	-	-
		FTP	-	076523	-
	2 RJ 45 sockets for trunking	**FTP**	-	076546	076542
	Copper feedthrough	**STP**	078628	-	-
		UTP	-	078622	078620
		FTP	-	078623	078621

Legrand cabling system, LCS³ copper selection chart

zone distribution boxes

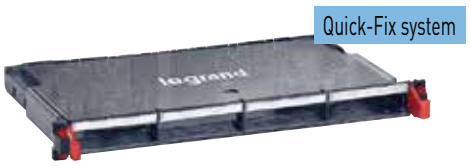
ZONE DISTRIBUTION BOXES / CONSOLIDATION POINT					Cat. 6A	Cat. 6	Cat. 5e
	Zone distribution box to be equipped	**12 ports**			033796	033796	033796
		24 ports			033797	033797	033797
RJ 45 CONNECTORS FOR ZONE DISTRIBUTION BOXES							
	6 RJ 45 connectors	**STP**			033775	033765	-
		UTP			033773	033763	033753
		FTP			-	033764	033754
RJ 45 CORDS FOR ZONE DISTRIBUTION BOXES							
	S/FTP cords	100 Ω impedance	RJ 45/stripped	8 m	051786	-	-
				15 m	051787	-	-
				20 m	051788	-	-
			RJ 45 - RJ 45	8 m	051523	-	-
				15 m	051524	-	-
				20 m	051525	-	-
	U/UTP cords	100 Ω impedance	RJ 45/stripped	8 m	-	051757	-
				15 m	-	051758	-
				20 m	-	051759	-
			RJ 45 - RJ 45	8 m	-	051510	051500
				15 m	-	051511	051501
				20 m	-	051512	051502
	F/UTP cords	100 Ω impedance	RJ 45/stripped	8 m	-	051796	-
				15 m	-	051797	-
				20 m	-	051798	-
			RJ 45 - RJ 45	8 m	-	051513	051503
				15 m	-	051514	051504
				20 m	-	051515	051505

Legrand cabling system, LCS³ fiber optic selection chart

19" standard solutions

CONFIGURE YOUR LCS³ FIBER OPTIC SYSTEM

Example:



Modular drawer

Blocks

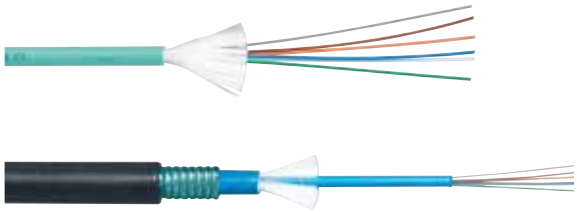
DRAWERS TO BE EQUIPPED (p. 137)

FIBER OPTIC DRAWERS				FIBER OPTIC BLOCKS								
Size	Type	Cat.No	Max. number of blocks	Number of fibers	SC duplex		SC duplex HD		SC APC duplex	LC duplex		
					Multimode	Single-mode	Multimode	Single-mode	Single-mode	Multimode	Single-mode	
19" modular	FLAT DRAWERS - QUICK-FIX SYSTEM											
	To be equipped with fiber optic blocks	032100	4	6	032120	032110	-	-	032112	032123 032136 (aqua)	032113	
				12	-	-	032121	032111	-	032124 032137 (aqua)	032114	
				24	-	-	-	-	-	-	-	
	ANGLED DRAWERS - QUICK-FIX SYSTEM											
	To be equipped with fiber optic blocks	032101	4	6	032120	032110	-	-	032112	032123 032136 (aqua)	032113	
				12	-	-	032121	032111	-	032124 032137 (aqua)	032114	
				24	-	-	-	-	-	-	-	

EQUIPPED DRAWERS (p. 137)

Size	Type	Capacity (fibers)	SC duplex		SC APC duplex
			Multimode	Single-mode	Single-mode
19" modular	SLIDING				
	Quick-Fix system	24	032102	032106	-
		48	-	-	-
19"	SLIDING				
	Screw fixing	24	032161	032164	032166
		48	-	-	-
	ROTATING				
	Screw fixing	36	032172	032174	-
		72	-	-	-

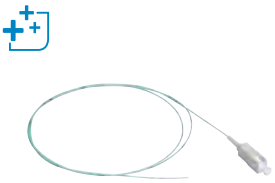
1 : MTP is a registered trademark of US Conec Ltd



Cables

+

Cords



Pigtails (p. 141)

	LC duplex HD		LC APC duplex	ST		4 MTP(1) feedthrough adaptor		Blanking plate	Copper block for 5 RJ 45	ACCESSORIES		
	Multimode	Single-mode	Single-mode	Multimode	Single-mode	Multimode	Single-mode			Cassette for pigtail	Coiling kit	Accessory for fan-out
	-	-	-	032127	032117	032134	032133	032129	032132	032130	032131	032128
	-	-	032116	-	-							
	032125	032115	-	-	-							
	-	-	-	032127	032117	032134	032133	032129	-	032130	032131	032128
	-	-	032116	-	-							
	032125	032115	-	-	-							

	LC duplex		LC APC duplex	ST
	Multimode	Single-mode	Single-mode	Multimode
	-	-	-	-
	032104	-	-	-
	-	-	-	032163
	032162	032165	032167	-
	-	-	-	-
	032171	032173	-	-

Legrand cabling system, LCS³ fiber optic selection chart

19" High Density solutions

CONFIGURE YOUR LCS³ HIGH DENSITY FIBER OPTIC SYSTEM

Example:

Modular panel

+

Cassettes

+

HIGH DENSITY PANELS TO BE EQUIPPED (p. 138)

HIGH DENSITY PANELS														
Size	Type	Cat.No			Capacity for 1U	Cat.No	Number of fibers	SC		SC HD		SC APC	LC	
		1 U	2 U	4 U				Multimode	Single-mode	Multimode	Single-mode	Single-mode	Multimode	
High Density 19" modular	To be equipped with cassettes to be equipped with fiber optic blocks	032175	032176	032177	CASSETTES TO BE EQUIPPED		FIBER OPTIC BLOCKS							
					4	032141	6	032120 (duplex)	032110 (duplex)	-	-	032112	032123 (duplex) 032136 (duplex-aqua)	
							12	-	-	032121 (duplex)	032111 (duplex)	-	032124 (duplex) 032137 (duplex-aqua)	
							24	-	-	-	-	-	-	
	To be equipped with pre-equipped cassettes (supplied with set of 6 or 12 OM3 pigtails)				PRE-EQUIPPED CASSETTES		PRETERMINATED (A/C POLARITY)							
					4	-	12	-	-	032143 (OM4)	032145 (OS2)	-	032148 (OM4)	
							24	-	-	032159 (OM4)	032160 (OS2)	-	-	
							WITH FIBER OPTIC BLOCKS + PIGTAILS							
							6	-	-	032180 (duplex-OM3)	032184 (duplex-OM3)	-	-	
							12	-	-	032182 (duplex-OM3)	032186 (duplex-OM3)	-	-	
	To be equipped with slim cassettes				SUPPORT FOR SLIM CASSETTES		PRETERMINATED - SLIM CASSETTES (UNIVERSAL POLARITY)							
					4	032138	12	-	-	-	-	-	-	
Zero-U kit	To be equipped with slim cassettes	032103			SUPPORT FOR SLIM CASSETTES		PRETERMINATED - SLIM CASSETTES (UNIVERSAL POLARITY)							
					1	032138	12	-	-	-	-	-	-	
	To be equipped with pre-equipped cassettes (supplied with set of 6 or 12 OM3 pigtails)				PRE-EQUIPPED CASSETTES		PRETERMINATED (A/C POLARITY)							
					1	-	12	-	-	-	-	-	-	
							24	-	-	-	-	-	-	
							WITH FIBER OPTIC BLOCKS + PIGTAILS							
							6	-	-	032180 (duplex-OM3)	032184 (duplex-OM3)	-	-	
							12	-	-	032182 (duplex-OM3)	032186 (duplex-OM3)	-	-	

1 : MTP is a registered trademark of US Conec Ltd

Links (p. 136)

Cords

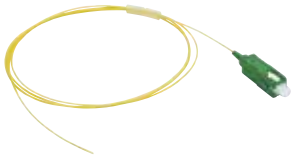
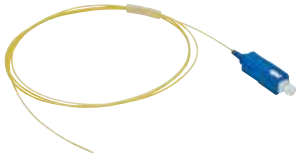
Pigtails (p. 141)

											ACCESSORIES	
	LC HD		LC APC	ST		8 MTP[1] feedthrough adaptor		Blanking cassette	RJ 45 copper cassette to be equipped	Cable management accessory	Front management HD modular panel
	Single-mode	Multimode	Single-mode	Single-mode	Multimode	Single-mode	Multimode	Single-mode				
	032113	-	-	-	032127	032117	032118	032119	033757	033755 (to be equipped with copper connectors)	032146 (for 1 U panel only, supplied for 2 U and 4 U panels)	032178 (for 1 U panel only, supplied for 2 U and 4 U panels)
	032114 (duplex)	-	-	032116	-	-						
	-	032125 (duplex)	032115 (duplex)	-	-	-						
	032149 (OS2)	-	-	-	-	-	-	-	033757	033755 (to be equipped with copper connectors)	032146 (for 1 U panel only, supplied for 2 U and 4 U panels)	032178 (for 1 U panel only, supplied for 2 U and 4 U panels)
	-	032142 (OM4)	032144 (OS2)	-	-	-						
	-	032181 (duplex-OM3)	032185 (duplex-OM3)	-	-	-						
	-	032183 (duplex-OM3)	032187 (duplex-OM3)	-	-	-						
	-	032169 (OM4) 032168 (OM3)	032170 (OS2)	-	-	-	-	-	032139	033755 (to be equipped with copper connectors)	032146 (for 1 U panel only, supplied for 2 U and 4 U panels)	032178 (for 1 U panel only, supplied for 2 U and 4 U panels)
	-	032169 (OM4) 032168 (OM3)	032170 (OS2)	-	-	-	-	-	032139	-	-	-
	-	032148 (OM4)	032149 (OS2)	-	-	-	-	-	-	033755 (to be equipped with copper connectors)	-	-
	-	032142 (OM4)	032144 (OS2)	-	-	-						
	-	032181 (duplex-OM3)	032185 (duplex-OM3)	-	-	-						
	-	032183 (duplex-OM3)	032187 (duplex-OM3)	-	-	-						

Legrand cabling system, LCS³ fiber optic selection chart

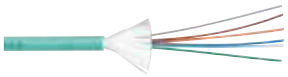
pigtails, cables and patch cords

PIGTAILS (p. 141)

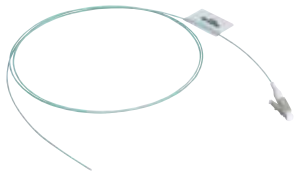

Length (m)	OS2 - 9/125 µm					OM3 - 50/125 µm		
	SC - APC	LC - APC	SC - UPC	LC - UPC	ST - UPC	SC	LC	ST
1	032240	032242	032241	032243 032624 (set of 12 pigtails)	032244	032220	032221 032626 (set of 12 pigtails)	032222
2	032245	032248	032246	032247	032249	032223	032224	-

CABLES (p. 135)

Drum 2000m except information	OS2 - 9/125 µm				
	Number of fibers				
	4	6	8	12	24
Tightbuffer LSZH sheath Indoor/Outdoor 				032550	
Loose LSZH sheath Indoor/Outdoor 	032502	032512	032503	032514 (Dca) 032526 (Cca)	032551
Loose PE sheath corrugated steel OUTDOOR CORRUGATED STEEL 	032523	032513	032524	032515	032525

PATCH CORDS (p. 142)

Length (m)	OS2 - 9/125 µm						
	Core™ fiber patch cords			Ultra™ fiber patch cords			
	SC/SC duplex	SC/LC duplex	LC/LC duplex	SC/SC duplex	SC/LC duplex	LC/LC duplex	LC/LC Uniboot duplex
0.5	-	-	032628	-	-	-	-
1	032600	032603	032606	032527	032530	032533	032686
2	032601	032604	032607	032528	032531	032534	032687
3	032602	032605	032608	032529	032532	032535	032688
5	-	-	032629	-	-	032536	032689
10	-	-	-	-	-	-	032692



	OM4 - 50/125 µm			Heat-shrinkable sleeve	50/125 and 62.5/125 µm glue-on connectors		Fan-out units	
	SC	LC	ST		SC	LC	6 fibers	12 fibers
	032230	032231 032671 (set of 12 pigtails)	032232	032744 (pack of 50 sleeves)	033147	033100	033048	033049
	032233	032234	-					

	OM3 - 50/125 µm					OM4 - 50/125 µm				
	Number of fibers					Number of fibers				
	4	6	8	12	24	4	6	8	12	24
		032510		032511	032552		032665 (drum of 500m) 032666 (drum of 1000m)		032567 (drum of 1000m)	032668 (drum of 1000m)
	032537		032538	032539	032553	032543		032544	032545 (Dca) 032549 (Cca)	
			032540	032541	032542	032546		032547	032548	

	OM3 - 50/125 µm			OM4 - 50/125 µm					
	Core™ fiber patch cords			Core™ fiber patch cords			Ultra™ fiber patch cords		
	SC/SC duplex	SC/LC duplex	LC/LC duplex	SC/SC duplex	SC/LC duplex	LC/LC duplex	SC/SC duplex	LC/LC duplex	LC/LC Uniboot duplex
	-	-	-	-	-	-	-	032633	032695
	032609	032612	032615	032260	032263	032266	032630	032634	032696
	032610	032613	032616	032261	032264	032267	032631	032635	032697
	032611	032614	032617	032262	032265	032268	032632	032636	032698
	-	-	-	-	-	-	-	032637	032699
	-	-	-	-	-	-	-	-	-

Other configurations
On request

Euroclasses
see p. 146

Legrand cabling system, LCS³ fiber optic selection chart

simplex preterminated links and High Density preterminated links

LCS³ SIMPLEX PRETERMINATED LINKS (p. 136)

Length (m)	Tight-buffer OM3		
	6 SC - 6 SC	12 SC - 12 SC	
10	132001	132021	
20	132002	132022	
30	132003	132023	
40	132004	132024	
50	132005	132025	
60	132006	132026	
70	132007	132027	
80	132008	132028	
90	132009	132029	
100	132010	132030	
120	132012	132032	
140	132014	132034	
160	132016	132036	
180	132018	132038	
200	132020	132040	

LCS³ HIGH DENSITY PRETERMINATED LINKS (p. 46)

Length (m)	Fan-out - Fan-out OS2		Fan-out - Fan-out OM3		
	6 LC duplex - 6 LC duplex	12 LC duplex - 12 LC duplex	6 LC duplex - 6 LC duplex	12 LC duplex - 12 LC duplex	
10	032421	032431	032401	032411	
20	032422	032432	032402	032412	
30	032423	032433	032403	032413	
40	032424	032434	032404	032414	
50	032425	032435	032405	032415	

1 : MTP is a registered trademark of US Conec Ltd

	6 LC - 6 LC	12 LC - 12 LC
	132041	132061
	132042	132062
	132043	132063
	132044	132064
	132045	132065
	132046	132066
	132047	132067
	132048	132068
	132049	132069
	132050	132070
	132052	132072
	132054	132074
	132056	132076
	132058	132078
	132060	132080

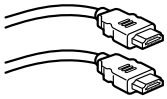
OM4 and OM5 simplex preterminated links
On request

	MTP(1) OS2	MTP(1) OM3
	MTP(1) - MTP(1) 12 fibers	MTP(1) - MTP(1) 12 fibers
	032451	032441
	032452	032442
	032453	032443
	032454	032444
	032455	032445

OM4 and OM5 High Density preterminated links
On request

Legrand cabling system, LCS³ audio/video selection chart

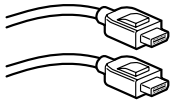
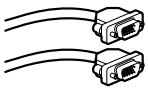
cords

CORDS FOR AUDIO/VIDEO AND DATA APPLICATIONS			
	High Speed HDMI cords with Ethernet	1 m	051732
		2 m	051733
		3 m	051734
		5 m	051727
		7 m	051735
	Standard HDMI cords with Ethernet	10 m	051720
		15 m	051736

Mosaic audio/video sockets
p. 137-138

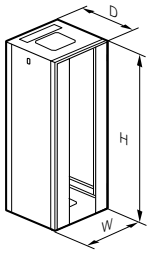
Legrand cabling system, LCS³ audio/video selection chart

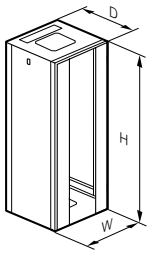
cords and cables

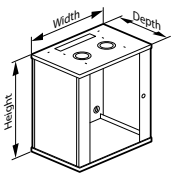
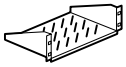
CORDS FOR AUDIO/VIDEO AND DATA APPLICATIONS			
	DisplayPort cords	2 m	051400
	HD15 male/male cords	2 m	051729
		5 m	051730
		10 m	051723
		15 m	051731
	HD15 cord + Jack 3.5 mm	2 m	051722

Legrand cabling system, Linkeo enclosures selection chart

cabinets, wall-mounting cabinets

19" LINKEO NETWORK CABINETS DELIVERED ASSEMBLED				Depth 600 mm	Depth 800 mm	Depth 1000 mm
	Single front door	24 U	Width 600 mm	646750	-	-
		24 U	Width 800 mm	-	646751	-
		33 U	Width 600 mm	646755	-	-
		33 U	Width 800 mm	-	646756	-
		42 U	Width 600 mm	646760	646761	646762
		42 U	Width 800 mm	646763	676764	646765
		47 U	Width 800 mm	-	646773	646774
	Expansion box single door	42 U	Width 800 mm	-	646770	-
	Front double door	42 U	Width. 800 mm	646766	646767	646768
	Profiles 19"	24 U		646340		
		33 U		646341		
		42 U		646342		
		47 U		646343		
	Linkeo sockets		Width 600 mm	646400	646401	646402
			Width 800 mm	646401	646403	646404
	Linkeo ventilation kit		2 ventilation fans	646430		
			4 ventilation fans	646431		
ACCESSORIES FOR LINKEO 19" NETWORK CABINETS						

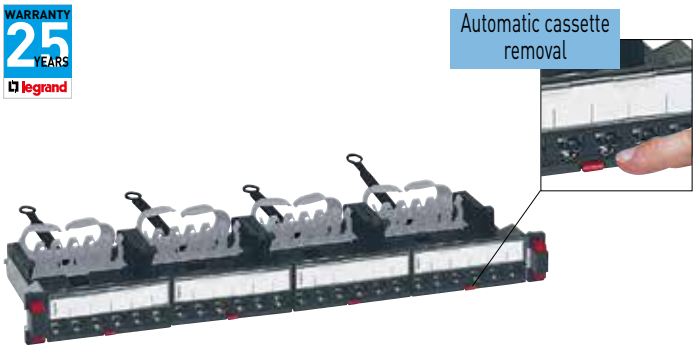
LINKEO 19" NETWORK CABINETS FLAT PLACK				Depth 600 mm	Depth 800 mm	Depth 1000 mm
	Single front door	24 U	Width 600 mm	646775	-	-
		24 U	Width 800 mm	-	646776	-
		33 U	Width 600 mm	646780	-	-
		33 U	Width 800 mm	-	646781	-
		42 U	Width 600 mm	646785	646786	646787
		42 U	Width 800 mm	646788	646789	646790
		47 U	Width 800 mm	-	646798	646799
	Expansion box single door	42 U	Width 800 mm	-	646795	-
	Front double door	42 U	Width. 800 mm	-	-	-
	Profiles 19"	24 U		646340		
		33 U		646341		
		42 U		646342		
		47 U		646343		
	Linkeo sockets		Width 600 mm	646400	646401	646402
			Width 800 mm	646401	646403	646404
	Linkeo ventilation kit		2 ventilation fans	646430		
			4 ventilation fans	646431		
ACCESSORIES FOR LINKEO 19" NETWORK CABINETS						

LINKEO 19" WALL-MOUNTING CABINETS AND ACCESSORIES			FIXED		HINGE
			Depth 400 mm	Depth 600 mm	Depth. 600 mm
	6 U	Height 350 mm* x width 600 mm	646200	646210	-
	9 U	Height 500 mm* x width 600 mm	646201	646211	646221
	12 U	Height 600 mm* x width 600 mm	646202	646212	646222
	15 U	Height 700 mm* x width 600 mm	646203	646213	646223
	16 U	Height 800 mm* x width 600 mm	646204	646214	646224
	21 U	Height 1000 mm* x width 600 mm	646205	646215	646225
	Trays	Depth 200 mm	646501	646501	646501
		Depth 360 mm	-	646502	646502
	Accessories	Set of 4 wheels for all grids	-	-	646248
		Ventilation kit	646238	646238	-

Legrand cabling system, LCS³ Power Distribution Units selection chart

BASIC POWER DISTRIBUTION UNITS (PDUS)						
	IEC 60320 standard	6 sockets (C19)	Aluminium 1U 19"	3.7 kW	Cordless	646807
		10 sockets (C13)	Aluminium 1U 19"	3.7 kW	Cordless	646844
		12 sockets (C13)	Aluminium 1U 19"	3.7 kW	3 m cord	646815
		24 sockets (C13)	Aluminium Zero-U	7.4 kW	3 m cord	646857
					Cordless	646856
		8 sockets (6 C13 + 2 C19)	Aluminium 1U 19"	3.7 kW	3 m cord	646809
		24 sockets (20 C13 + 4 C19)	Aluminium Zero-U	7.4 kW	3 m cord	646861
					Cordless	646860
		24 sockets (18 C13 + 6 C19)	Aluminium Zero-U	11 kW	3 m cord	646870
	Schuko	4 sockets	Aluminium 1U 10"	3.7 kW	1 m cord	646801
		6 sockets	Aluminium 1U 19"	3.7 kW	3 m cord	646806
		6 sockets + MCB	Aluminium 1U 19"	3.7 kW	3 m cord	646831
		6 sockets + surge protection module	Aluminium 1U 19"	3.7 kW	3 m cord	646836
		8 sockets	Aluminium 1U 19"	3.7 kW	3 m cord	646823
		9 sockets	Aluminium 1U 19"	3.7 kW	3 m cord	646812
		9 sockets + power indicator	Aluminium 1U 19"	3.7 kW	3 m cord	646821
		9 sockets + MCB	Aluminium 2U 19"	3.7 kW	3 m cord	646832
		24 sockets	Aluminium Zero-U	7.4 kW	3 m cord	646853
					Cordless	646852

Legrand cabling system, LCS³ cat. 8
flat patch panels - equipped and to be equipped



033782

Equipped with new-generation Quick-Fix for automatic (screwless) mounting on enclosure and cabinet uprights
Universal mounting on all cabinets or enclosures
Panels ensure automatic earthing of each connector
Equipped with 4 bundles guides fixed at the rear

Cat.Nos.	Cat. 8 patch panel equipped with 24 RJ 45 connectors
	19" panel - 1U Equipped with 4 cassettes of 6 pre-fitted Cat. 8 LCS³ RJ 45 connectors Automatic cassette removal by simple pressure Each connector can be removed individually T568A and B marking with colour codes Equipped with rear cable guide to hold cable during maintenance Supplied with coloured labels Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards
	Flat panel
033782	STP panel - Metal shielding - PoE++

	Patch panels 24 connectors - to be equipped
	19" panels - 1U Equipped with rear cable guide to hold cables during maintenance
	Flat panel with empty cassettes to be equipped with connectors
033790	With 4 automatically removable cassettes to be equipped with Cat. 5e to Cat. 8 RJ 45 connectors
	Flat panel without connectors to be equipped with cassettes
033791	Can take a maximum of 4 automatically removable cassettes: - copper to be equipped with Cat. 5e to Cat. 8 RJ 45 connectors - fiber optic

Legrand cabling system, LCS³ cat. 8
angled patch panel to be equipped with connectors

033792

Cat.Nos.	Angled patch panel with 24 connectors
	19" panel - 1U Equipped with new-generation Quick-Fix for automatic mounting (screwless) on cabinet and enclosure uprights Universal mounting on all cabinets or enclosures Panels ensure automatic earthing of each connector Equipped with rear cable guide to hold cables during maintenance
	Angled patch panel to be equipped with connectors
033792	Can take up to 24 Cat. 5e to Cat. 8 RJ 45 connectors

Legrand cabling system, LCS³ cat. 8
connector, cords and cables


033785


033788


033703

Legrand cabling system, LCS³ cat. 8
accessories


033756


033759


033755


033766

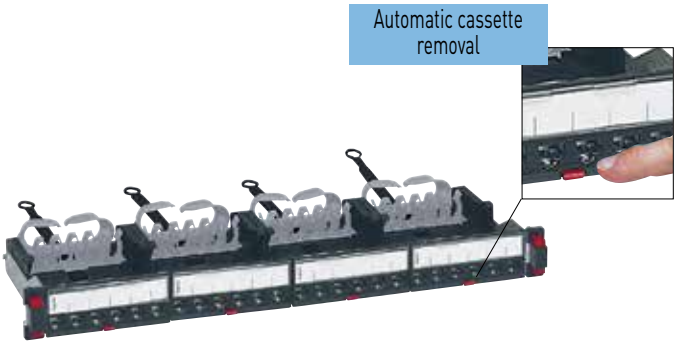

033757


033758

Cat.Nos.	Cat. 8 RJ 45 connector for flat or angled STP panel
033785	Set of 6 STP RJ 45 Quick-connect connectors (no tools required) T568A and B marking with colour codes Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards To be installed in cassettes for flat panels or directly in an angled panel or a zone distribution box to be equipped
	Cat. 8 cable for local networks
033788	Performance 2000 MHz Cable with 4 twisted pairs 100 Ω LSZH sheath: zero halogen EIA/TIA colour code Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards Product conforming to the CPR regulations **S/FTP - 4 pairs** Length 500 m, supplied on a drum Weight 45 kg
	Cat. 8 RJ 45 patch cords
LSZH RAL 6027 033703 033704	RJ 45/RJ 45 - straight Compliant with ISO/CEI 11801 and EIA/TIA 568 standards **Shielded S/FTP, impedance 100 Ω** Length 2 m Length 3 m
	Marking kit
051890	Kit of 200 coloured rings for marking RJ 45 cords 4 colors (green/red/yellow/blue). 50 pieces of each color Rings to be clipped onto the patch cords 1: in metre(s)

Cat.Nos.	Common accessories for flat and angled panels
033756	**Port blanking modules** Separable blanking plate For covering 1 to 6 ports or 1 to 12 ports individually (High Density solutions)
033759	**Cord management** 2 cable guides to be clipped onto new-generation Quick-Fix Provide side cord management Label-holder for identification
	Specific accessories for flat panels
033755	**Cassette for flat panels to be equipped** Removable empty cassette to be equipped with connectors, takes 6 Cat. 5e to Cat. 8 connectors Can be removed by simple pressing on the cassette, for ease of installation and maintenance For equipping flat panels
033766	**Cassette with shutters for flat panels to be equipped** Removable empty cassette to be equipped with connectors, takes 6 Cat. 5e to Cat. 8 connectors Can be removed by simple pressing on the cassette, for ease of installation and maintenance Equipped with 6 individual shutters to protect RJ 45 connectors contacts For equipping flat panels
033757	**Blanking cassette** To be used to fill gaps in the panel
	Specific accessory for angled panels
033758	**Cover** Optimises air flow management in the enclosure

Legrand cabling system, LCS³ cat. 6A
flat patch panels - equipped



033772

Equipped with new-generation Quick-Fix for automatic (screwless) mounting on enclosure and cabinet uprights
Universal mounting on all cabinets or enclosures
Panels ensure automatic earthing of each connector
Equipped with 4 bundles guides fixed at the rear

Cat.Nos.	Cat. 6A patch panels equipped with 24 RJ 45 connectors
	19" panel - 1U Equipped with 4 cassettes of 6 pre-fitted Cat. 6A LCS³ RJ 45 connectors Automatic cassette removal by simple pressure Each connector can be removed individually T568A and B marking with colour codes Equipped with rear cable guide to hold cables during maintenance Supplied with coloured labels Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards
	Flat panels 24 RJ 45 connectors - 1U - PoE++
033770	UTP
033772	STP

Legrand cabling system, LCS³ cat. 6A
flat patch panels, to be equipped

033790

033798

033799

Equipped with new-generation Quick-Fix for automatic (screwless) mounting on enclosure and cabinet uprights
Universal mounting on all cabinets or enclosures
Panels ensure automatic earthing of each connector
Equipped with 4 bundles guides fixed at the rear

Cat.Nos.	19" flat patch panels - to be equipped
	19" panels - 1U Equipped with rear cable guide to hold cables during maintenance Automatic cassette removal by simple pressure Each connector can be removed individually
	Flat panel with empty cassettes to be equipped with connectors
033790	Equipped with 4 automatically removable cassettes, takes up to 24 Cat. 5e to Cat. 8 RJ 45 connectors
	Empty flat panel to be equipped with cassettes
033791	Takes a maximum of 4 automatically removable cassettes: - copper to be equipped with Cat. 5e to Cat. 8 RJ 45 connectors - fiber optic
	High Density flat panel with empty cassettes to be equipped with connectors
033793	Equipped with 4 High Density cassettes, takes up to 48 Cat. 5e to Cat. 6A RJ 45 connectors

	10" flat patch panels - to be equipped
	10" panels - 1U
033798	Takes up to 6 Cat. 5e to Cat. 8 RJ 45 connectors
033799	Takes up to 12 Cat. 5e to Cat. 6A RJ 45 connectors

Legrand cabling system, LCS³ cat. 6A
angled patch panels to be equipped, connectors


033792


033794


033775

PoE+ Third Party certified

Equipped with new-generation Quick-Fix for automatic (screwless) mounting on enclosure and cabinet uprights.
Universal mounting on all cabinets or enclosures
Panels ensure automatic earthing of each connector
Equipped with 4 concentric strand guides fixed at the rear

Cat.Nos.	Angled patch panels - to be equipped
	19" panels - 1U
	Angled patch panel to be equipped with connectors
033792	Takes up to 24 Cat. 5e to Cat. 8 RJ 45 connectors
	High Density angled panel to be equipped with connectors
033794	Takes up to 48 Cat. 5e to Cat. 6A RJ 45 connectors

	Cat. 6A High Density RJ 45 connectors
	Quick-connect connection (no tools required) T568A and B marking with colour codes Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards To be installed in cassettes for flat panels or directly in an angled panel or a zone distribution box to be equipped Set of 6 RJ 45 connectors
033773	UTP
033775	STP

Legrand cabling system, LCS³ cat. 6A
accessories


033756


033759


033755


033766


033757


033758

Cat.Nos.	Common accessories for flat and angled panels
	Port blanking modules
033756	Separable blanking plate For covering 1 to 6 ports or 1 to 12 ports individually (High Density solutions)
	Cord management
033759	2 cable guides to be clipped onto new-generation Quick-Fix Provide side cord management Label-holder for identification

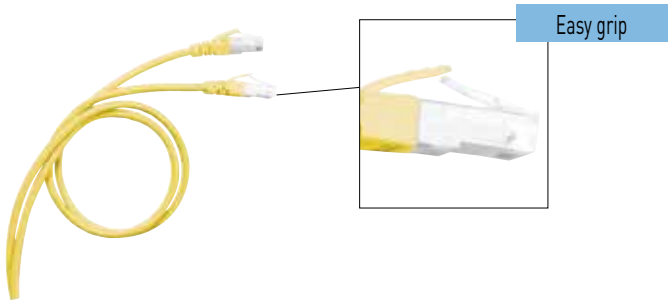
	Specific accessories for flat panels
033755	Removable empty cassette to be equipped with connectors, takes 6 Cat. 5e to Cat. 8 connectors Can be removed by simple pressing on the cassette, for ease of installation and maintenance For equipping flat panels
	Cassette with shutters for flat panels to be equipped
033766	Removable empty cassette to be equipped with connectors, takes 6 Cat. 5e to Cat. 8 connectors Can be removed by simple pressing on the cassette, for ease of installation and maintenance Equipped with 6 individual shutters to protect RJ 45 connectors contacts For equipping flat panels
	High Density cassette for flat panels to be equipped
033795	Removable empty cassette to be equipped with connectors, takes 12 Cat. 5e to Cat. 6A connectors Can be removed by simple pressing on the cassette, for ease of installation and maintenance For equipping flat panels
	Blanking cassette
033757	To be used to fill gaps in the panel

	Specific accessory for angled panels
	Cover
033758	Optimises air flow management in the enclosure

Legrand cabling system, LCS³ cat. 6A and cat. 7

cables and cords

032777



051782

Cat. 6A cables for local networks

Cat.Nos.	
	Performance 500 MHz 4 twisted pair cables, 100 Ω LSZH sheath: zero halogen ANSI/TIA colour code Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards Products conforming to the CPR regulations
LSZH	
	U/UTP - 4 pairs
032787	Length 500 m. Supplied on reel. Weight 35 kg Euroclass Dca
032828	Length 500m. Supplied on reel. Weight 36 kg Euroclass Cca
032838	Length 500m. Supplied on reel. Weight 33kg Euroclass B2ca
	F/UTP - 4 pairs
032778	Length 500 m. Supplied on reel. Weight 29.2 kg Euroclass Dca
	F/UTP - 2 x 4 pairs
032878	Length 500 m. Supplied on reel. Weight 58 kg Euroclass Dca
	F/FTP - 4 pairs
032883	Length 500 m. Supplied on reel. Weight 32 kg Euroclass Cca
032799	Length 500 m. Supplied on reel. Weight 26 kg Euroclass Dca
	F/FTP - 2 x 4 pairs
032798	Length 500 m. Supplied on reel. Weight 62 kg Euroclass Dca
	U/FTP - 4 pairs
032884	Length 500 m. Supplied on reel. Weight 39 kg Euroclass Cca

Cat. 7 cables for local networks

	Performance 600 MHz 4 twisted pair cables, 100 Ω LSZH sheath: zero halogen ANSI/TIA colour code Compliant with ISO/IEC 11 801 and EN 50173 standards Products conforming to the CPR regulations
LSZH	
	S/FTP - 4 pairs
032882	Length 500 m. Supplied on reel. Weight 33 kg Euroclass B2 ca
032849	Length 500m. Supplied on reel. Weight 31 kg Euroclass Cca
032777	Length 500 m. Supplied on reel. Weight 30 kg Euroclass Dca
	S/FTP - 2 x 4 pairs
032779	Length 500 m. Supplied on reel. Weight 63 kg Euroclass Dca

Cat. 7 indoor/outdoor cable for local networks

	Performance 600 MHz 4 twisted pair cable, 100 Ω LSZH sheath: zero halogen ANSI/TIA colour code Compliant with ISO/IEC 11 801 and EN 50173 standards Product conforming to the CPR regulations
LSZH	
	S/FTP - 4 pairs - indoor/outdoor
033890	Length 500 m. Supplied on reel. Weight 26 kg Euroclass Eca

Cat. 6A RJ 45 patch cords and user cords

Cat.Nos.	
	RJ 45/RJ 45 - flat With special "easy grip" plug Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards
PVC	
	Unscreened U/UTP, impedance 100 Ω
051882	Length 1 m
051883	Length 2 m
051884	Length 3 m
051885	Length 5 m
LSZH	
051878	Length 1 m
051879	Length 2 m
051880	Length 3 m
051881	Length 5 m
051874	Length 1 m
051875	Length 2 m
051876	Length 3 m
051877	Length 5 m
PVC	
	Shielded S/FTP, impedance 100 Ω
051848	Length 0.3 m
051816	Length 0.5 m
051780	Length 1 m
051781	Length 2 m
051782	Length 3 m
051783	Length 5 m
051849	Length 10 m
LSZH	
051870	Length 1 m
051871	Length 2 m
051872	Length 3 m
051873	Length 5 m
051866	Length 1 m
051867	Length 2 m
051868	Length 3 m
051869	Length 5 m

Cat. 6A RJ 45 patch cords and user cords - High Density

	RJ 45/RJ 45 - flat With special "easy grip" plug Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards
LSZH	
	Shielded S/FTP, impedance 100 Ω
051550	Length 0.5 m
051551	Length 1 m
051552	Length 2 m
051553	Length 3 m
051554	Length 5 m

Marking kit

051890	Kit of 200 coloured rings for marking RJ 45 cords 4 colors (green/red/yellow/blue). 50 pieces of each color Rings to be clipped onto the patch cords

1: in metre(s)

Legrand cabling system, LCS³ cat. 6A

RJ 45 sockets - Mosaic™


076573


076576


079476


076524


076525


076599

Can be integrated in any support
Mechanisms to be equipped with support frames and plates
Equipped with connectors with quick toolless connection
Take single-core cables from AWG 22 up to AWG 26, and AWG 26 multicore cables
T568A and B marking with colour codes
Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards

Cat.Nos.	RJ 45 LivingLight module Category 6A STP
	STP - 1 module
	Metal shielding
076573	○ White
076584	○ White antimicrobial(1)
079473	● Aluminium
079173L	● Matt Black
	STP - 2 modules
	Metal shielding
076576	○ White
079476	● Aluminium
079176L	● Matt Black
076524	○ White with green shutter
076525	○ White with orange shutter
	STP with controlled access - 2 modules
	Metal shielding
	Supplied with 2 keys for 5 sockets
076599	○ White with red shutter
	STP 45° - 2 modules
	Metal shielding
076508	○ White
	UTP - 1 module
076571	○ White
079471	● Aluminium
076526	○ White with green shutter
076527	○ White with orange shutter
	UTP - 2 modules
076574	○ White
079474	● Aluminium
	UTP with controlled access - 2 modules
	Supplied with 2 keys for 5 sockets
076590	○ White with red shutter
	UTP 45° - 2 modules
076509	○ White

1: Contains a silver compound which prevents the growth of bacteria on the surface

Legrand cabling system, LCS³ cat. 6A

RJ 45 sockets


033154


076589


BTL4279C6A

Cat.Nos.	Keystone connectors for third-party switchgear
033154	1x RJ 45 STP Cat. 6A
076589	1x RJ 45 UTP Cat. 6A

Cat.Nos.	RJ 45 LivingLight module Category 6A STP
	STP - 1 module - with spring-loaded shutter
	Support frame and cover rail to be ordered separately
☐ BTN4279C6A	1x RJ 45 STP Cat. 6A
■ BTNT4279C6A	
■ BTL4279C6A	

Cat.Nos.	RJ 45 DIN-rail modules
413104	**STP - 1 DIN module - met verende shutter** RJ 45 distribution module - IP 20 - IK 04 Equipped with a shielded RJ 45 connector category 6A STP, reversible front panel (control of the rooms upwards or downwards) Equipped with a label holder to indicate the room 1 DIN module Indication by wheel of what the connection is used for

Cat.Nos.	RJ 45 Soliroc Category 6A IK10
077899	IP 20 For high-risk locations FTP socket Cover plate to be ordered separately

Legrand cabling system, LCS³ cat. 6A
other RJ 45 connectors


632779


033749


069559

Surface mounting box - 1 or 2 ports

Cat.Nos.	
632779	For Keystone connectors For surface mounting installations Can be fixed to a table or used in conjunction with mini-trunking

STP Cat. 6A cable extender

Cat.Nos.	
033743	To be used to extend a cable quickly and easily

STP Cat. 6A field plug

Cat.Nos.	
033749	To be used to make a direct connection on any IP equipment (switch, PoE LED panel, camera, Wi-Fi access point, etc) No tools required

STP Cat. 6A Plexo RJ 45 socket

Cat.Nos.	
077899	IP 55 closed flap IK 07 Grey

Legrand cabling system, LCS³ cat. 6A
zone distribution box solution


033797


033775


078628

Zone distribution boxes to be equipped

Cat.Nos.	
	For distributing data in an area equipped with 1 to 24 RJ 45 sockets Centralise connections to ensure flexibility and scalability of the installation For installation in false ceilings or raised access floors The boxes connect to the patching enclosure or floor cabinet Connection to an RJ 45 socket with an RJ 45/stripped cord or to a Mosaic RJ 45 socket with copper feedthrough with an RJ 45/RJ 45 cord IP 21 - IK 07 Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards T568A and B marking with colour codes Technical characteristics: polycarbonate cover (PC), polypropylene base (PP), RAL 7035 To be equipped directly with High Density RJ 45 connectors
033796	12 ports to be equipped
033797	24 ports to be equipped

Cat. 6A High Density RJ 45 connectors

Cat.Nos.	
	Set of 6 RJ 45 connectors
033773	UTP
033775	STP

Cat. 6A cords - RJ 45/stripped

Cat.Nos.	
	RJ 45/stripped - straight Plug in and out of the zone distribution boxes and connect to an LCS³ connector of an RJ 45 socket via the stripped side Cables prepared in factory, "ready for wiring" Compliant with ISO/IEC 11801 Ed. 2.0 (2011), EN 50173-1 and EIA/TIA 568 C2 standards
LSZH RAL 1018	**Shielded S/FTP, impedance 100 Ω**
051786	Length 8 m
051787	Length 15 m
051788	Length 20 m

Cat. 6A cords - RJ 45/RJ 45

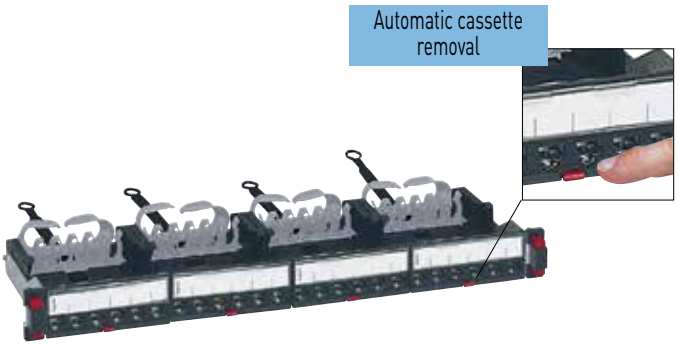
Cat.Nos.	
	For direct connection via RJ 45 male plug to the zone distribution box and to the RJ 45 socket with copper feedthrough to ensure safe connection, plus speed and reliability of connection Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards
LSZH RAL 1018	**Shielded S/FTP, impedance 100 Ω**
051523	Length 8 m
051524	Length 15 m
051525	Length 20 m

Cat. 6A sockets with copper feedthrough

Cat. 6A STP - Mosaic

Cat.Nos.	
078628	White
078629	Aluminium

Legrand cabling system, LCS³ cat. 6
flat patch panels - equipped



033761

Equipped with new-generation Quick-Fix for automatic (screwless) mounting on enclosure and cabinet uprights
Universal mounting on all cabinets or enclosures
Panels ensure automatic earthing of each connector
Equipped with 4 bundles guides fixed at the rear

Cat.Nos.	**Cat. 6 patch panels equipped with 24 RJ 45 connectors**
	19" panels - 1U Equipped with 4 cassettes of 6 pre-fitted Cat. 6 LCS³ RJ 45 connectors Automatic cassette removal by simple pressure Each connector can be removed individually T568A and B marking with colour codes Equipped with rear cable guide to hold cables during maintenance Supplied with numbered colour labels Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards
	Flat panels 24 RJ 45 connectors - 1U - PoE++
033760	UTP
033761	FTP
033762	STP

Legrand cabling system, LCS³ cat. 6
flat patch panels, to be equipped


033790


033798


033799

Equipped with new-generation Quick-Fix for automatic (screwless) mounting on enclosure and cabinet uprights
Universal mounting on all cabinets or enclosures
Panels ensure automatic earthing of each connector
Equipped with 4 bundles guides fixed at the rear

Cat.Nos.	**19" flat patch panels - to be equipped**
	19" panels - 1U Equipped with rear cable guide to hold cables during maintenance Automatic cassette removal by simple pressure Each connector can be removed individually
033790	**Flat panel with empty cassettes to be equipped with connectors** Equipped with 4 automatically removable cassettes, takes up to 24 Cat. 5e to Cat. 8 RJ 45 connectors
033791	**Empty flat panel to be equipped with cassettes** Can take a maximum of 4 automatically removable cassettes: - copper to be equipped with Cat. 5e to Cat. 8 RJ 45 connectors - fiber optic
033793	**High Density flat panel with empty cassettes to be equipped with connectors** Equipped with 4 High Density cassettes, takes up to 48 Cat. 5e to Cat. 6A RJ 45 connectors

	10" flat patch panels - to be equipped
	10" panels - 1U
033798	Takes up to 6 Cat. 5e to Cat. 8 RJ 45 connectors
033799	Takes up to 12 Cat. 5e to Cat. 6A RJ 45 connectors

Legrand cabling system, LCS³ cat. 6
angled patch panels to be equipped, connectors


033792


033794


033763

Equipped with new-generation Quick-Fix for automatic (screwless) mounting on enclosure and cabinet uprights
Universal mounting on all cabinets or enclosures
Panels ensure automatic earthing of each connector
Equipped with 4 concentric strand guides fixed at the rear

Cat.Nos.	Angled patch panels - to be equipped
	19" panels - 1U
033792	**Angled patch panel to be equipped with connectors** Takes up to 24 Cat. 5e to Cat. 8 RJ 45 connectors
033794	**High Density angled panel to be equipped with connectors** Takes up to 48 Cat. 5e to Cat. 6A RJ 45 connectors

	Cat. 6 High Density RJ 45 connectors
	Quick-connect connection (no tools required) T568A and B marking with colour codes Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards To be installed in cassettes for flat panels or directly in an angled panel or a zone distribution box to be equipped Set of 6 RJ 45 connectors
033763	UTP
033764	FTP
033765	STP

Legrand cabling system, LCS³ cat. 6
accessories


033756


033759


033755


033766


033757

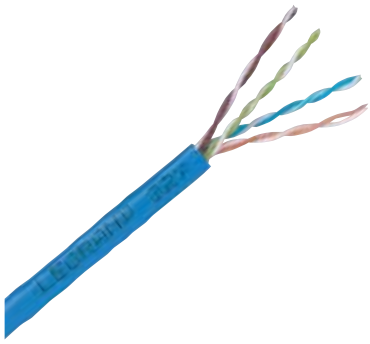

033758

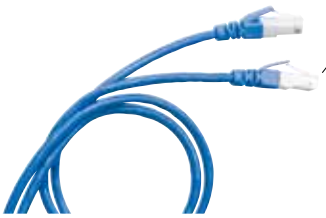
Cat.Nos.	Common accessories for flat and angled panels
033756	**Port blanking plate** Separable blanking plate For covering 1 to 6 ports or 1 to 12 ports individually (High Density solutions)
033759	**Cord management** 2 cable guides to be clipped onto new-generation Quick-Fix Provide side cord management Label-holder for identification

	Specific accessories for flat panels
033755	**Cassette for flat panels to be equipped** Removable empty cassette to be equipped with connectors, takes 6 Cat. 5e to Cat. 8 connectors Can be removed by simple pressing on the cassette, for ease of installation and maintenance For equipping flat panels
033766	**Cassette with shutters for flat panels to be equipped** Removable empty cassette to be equipped with connectors, takes 6 Cat. 5e to Cat. 8 connectors Can be removed by simple pressing on the cassette, for ease of installation and maintenance Equipped with 6 individual shutters to protect RJ 45 connectors contacts For equipping flat panels
033795	**High Density cassette for flat panels to be equipped** Removable empty cassette to be equipped with connectors, takes 12 Cat. 5e to Cat. 6A connectors Can be removed by simple pressing on the cassette, for ease of installation and maintenance For equipping flat panels
033757	**Blanking cassette** To be used to fill gaps in the panel

	Specific accessory for angled panels
033758	**Cover** Optimises air flow management in the enclosure

Legrand cabling system, LCS³ cat. 6
cables and cords


032754


051754

051541

Cat.Nos		Cat. 6 cables for local networks
		Performance 250 MHz Cables with 4 pairs or 2 x 4 twisted pairs, 100 Ω Blue RAL 5015 ANSI/TIA colour code Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards Products conforming to the CPR regulations Euroclass Dca for LSZH cables (except Cat No 032886: Euroclass Cca and Cat No 0 328 79 : Euroclass B2ca), Euroclass Eca for PVC cables
LSZH	PVC	**U/UTP - 4 pairs**
032754		Length 305 m Supplied in cardboard box. Weight 14 kg
032886		Length 305 m Supplied in cardboard box. Weight 15 kg
032879		Length 500m Supplied on reel. Weight 24 kg
032861		Length 500 m Supplied on reel. Weight 19 kg
	032755	Length 305 m Supplied in cardboard box. Weight 13 kg
		F/UTP - 4 pairs
032856		Length 305 m Supplied in reel in box. Weight 19 kg
032756		Length 500 m Supplied on reel. Weight 27 kg
		F/UTP - 4 pairs
	032857	Length 305 m Supplied in reel in box. Weight 20 kg
	032758	Length 500 m Supplied on reel. Weight 25 kg
		F/UTP - 2 x 4 pairs
032776		Length 500 m Supplied on reel. Weight 51 kg
		SF/UTP - 4 pairs
032757		Length 500 m Supplied on reel. Weight 31 kg
	032759	Length 500 m Supplied on reel. Weight 30 kg

1: in metre(s)

Cat.Nos		Cat. 6 RJ 45 patch cords and user cords
PVC RAL 5015		RJ 45/RJ 45 - straight Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards
		Shielded SF/UTP, impedance 100 Ω
051752		Length 1 m
051753		Length 2 m
051754		Length 3 m
051755		Length 5 m
		Screened F/UTP, impedance 100 Ω
051815		Length 0.5 m
051762		Length 1 m
051763		Length 2 m
051764		Length 3 m
051765		Length 5 m
LSZH RAL 3020	LSZH RAL 6026	
051854	051850	Length 1 m
051855	051851	Length 2 m
051856	051852	Length 3 m
051857	051853	Length 5 m
PVC RAL 5015		**Unscreened U/UTP, impedance 100 Ω**
051818		Length 0.5 m
051772		Length 1 m
051773		Length 2 m
051774		Length 3 m
051775		Length 5 m
LSZH RAL 3020	LSZH RAL 6026	
051862	051858	Length 1 m
051863	051859	Length 2 m
051864	051860	Length 3 m
051865	051861	Length 5 m

		Cat. 6 RJ 45 patch cords and user cords - High Density
LSZH RAL 5015		RJ 45/RJ 45 - straight Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards
		Screened F/UTP, impedance 100 Ω
051540		Length 0.5 m
051541		Length 1 m
051542		Length 2 m
051543		Length 3 m
051544		Length 5 m
		Unshielded U/UTP impedance 100 Ω
051545		Length 0.5 m
051546		Length 1 m
051547		Length 2 m
051548		Length 3 m
051549		Length 5 m

	Marking kit
051890	Kit of 200 coloured rings for marking RJ 45 cords 4 colors (green/red/yellow/blue). 50 pieces of each color Rings to be clipped onto the patch cords

Legrand cabling system, LCS³ cat. 6

RJ 45 sockets - Mosaic™


079165L


079433


076563


076596

Can be integrated in any support
Mechanisms to be equipped with support frames and plates
Equipped with connectors with quick toolless connection
Take single-core cables from AWG 22 up to AWG 26, and AWG 26 multicore cables
T568A and B marking with colour codes
Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards

Cat.Nos.	Cat. 6 RJ 45 sockets - Mosaic
	UTP - 1 module
076561 079461 079461L 076581	○ White ● Aluminium ● Matt Black ○ White antimicrobial(1)
	UTP - 2 modules
076564 079464 079164L	○ White ● Aluminium ● Matt Black
	UTP with controlled access - 2 modules Supplied with 2 keys for 5 sockets
076594	○ White with red shutter
	UTP 90° - 2 modules Vertical snap-on socket for column module
076591	○ White
	UTP 45° - 2 modules
076503	○ White
	UTP 45° - 2 x RJ 45 - 2 modules
076504	○ White
	UTP with retractable cord - 4 modules With integrated retractable cord (0.9 m) Automatically winds back in at the press of a button
076532	○ White
	UTP 2 x RJ 45 with Soluclip accessory - 4 modules For snap-on mounting on DLP trunking with 45 mm cover
076544	○ White
	FTP - 1 module
076562 079462 079162L 076582	○ White ● Aluminium ● Matt Black ○ White antimicrobial(1)
	FTP - 2 modules
076565 079465 079165L 076522 076523	○ White ● Aluminium ● Matt Black ○ White with green shutter ○ White with orange shutter
	FTP 2 x RJ 45 with Soluclip accessory - 4 modules For snap-on mounting on trunking with 45 mm cover
076546	○ White

1: Contains a silver compound which prevents the growth of bacteria on the surface

Cat.Nos.	Cat. 6 RJ 45 sockets - Mosaic (continued)
	FTP with controlled access - 2 modules Supplied with 2 keys for 5 sockets
076595	○ White with red shutter
	FTP 45° - 2 modules
076505	○ White
	FTP 45° - 2 x RJ 45 - 2 modules
076506	○ White
	FTP with retractable cord - 4 modules With integrated retractable cord (0.9 m) Automatically winds back in at the press of a button
076533 079433	○ White ● Aluminium
	FTP 90° - 2 modules Vertical snap-on socket for column module
076592 079492	○ White ● Aluminium
	Shielded STP - 1 module
076563 076583	○ White ○ White antimicrobial(1)
	Shielded STP - 2 modules
076566	○ White
	Shielded STP with controlled access - 2 modules Supplied with 2 keys for 5 sockets
076596	○ White with red shutter
	STP 45° - 2 modules
076507	○ White
	Shielded STP 90° - 2 modules Vertical snap-on socket for column module
076593	○ White

1: Contains a silver compound which prevents the growth of bacteria on the surface

Legrand cabling system, LCS³ cat. 6

RJ 45 sockets (Soliroc and Plexo) and other connectors

BTL4279C6

BTHC4279C6

069569

632779

Can be integrated in any support
Equipped with connectors with quick toolless connection
Take single-core cables from AWG 22 up to AWG 26, and AWG 26 multicore cables
T568A and B marking with colour codes
Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards

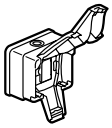
Cat.Nos.	RJ 45 LivingLight module Category 6
	Supporting frame and cover rail to be ordered separately
☐ BTN4279C6 ▒ BTNT4279C6 ■ BTL4279C6	 UTP - 1 module - with spring-loaded shutter
☐ BTN4279C6F ▒ BTNT4279C6F ■ BTL4279C6F	 FTP - 1 module - with spring-loaded shutter
☐ BTN4279C6S ▒ BTNT4279C6S ■ BTL4279C6S	 STP - 1 module - with spring-loaded shutter

Cat.Nos.	RJ 45 Valena Next Category 6
	RJ 45 module in support frame, the cover edge must be ordered separately
	UTP - 1 xRJ 45 - with spring-loaded shutter
741275 741375 741475	 ☐ White ▒ Aluminium ■ Black
	UTP - 2 xRJ 45 - with spring-loaded shutter
741276 741376 741476	 ☐ White ▒ Aluminium ■ Black

Cat.Nos.	RJ 45 DIN-rail modules
	1 DIN module - with spring-loaded shutter RJ 45 distribution module - IP 20 - IK 04 Equipped with a shielded RJ 45 connector category 6_A STP, reversible front panel (control of the rooms upwards or downwards) Equipped with a label holder to indicate the room - 1 DIN module Indication with wheel what the connection is used for
413101	UTP
413102	FTP
413103	STP

Cat.Nos.	Cat. 6 Soliroc RJ 45 socket - IK 10
	FTP - 2 modules
077891	 IP 20 - IK 10 For at-risk areas or areas without surveillance

Cat.Nos.	Cat. 6 Plexo RJ 45 sockets - IP 55 closed flap IK 07
	RJ 45 sockets Protection against water, dust For industrial sites ▒ Grey
069569	 FTP socket
069561	UTP socket
	Adaptor for RJ 45 socket
069581	 RJ 45 to be ordered separately Guaranteed weatherproof seal (IP 44) with the plug inserted ▒ Grey

Cat.Nos.	Cat. 6 Plexo 66 RJ 45 socket - IP 66 - IK 08
	FTP socket
090467	 9 contacts Guaranteed weatherproof seal (IP 66) with the plug inserted Inclined 90° ● Grey RAL 7016/T029

Cat.Nos.	Surface mounting box - 1 or 2 ports
632779	For Keystone connectors For surface mounting installations Can be fixed to a table or used in conjunction with mini-trunking

Cat.Nos.	Surface mounting box - 1 or 2 ports
	To be used to extend a cable quickly and easily
033748	For FTP Cat. 6 cables
033742	For UTP Cat. 6 cables

Cat.Nos.	Keystone connectors for third-party switchgear
076588	 Height 19,4 mm Width 14,6 mm 1 x RJ 45 UTP Cat. 6

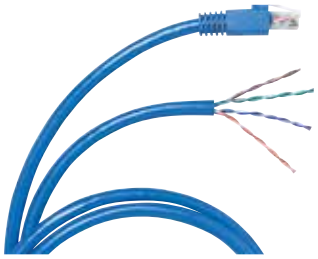
Audio/video sockets and Mosaic
p. 137-138

Legrand cabling system, LCS³ cat. 6

zone distribution box solution

033797

033763



051757

Cat.Nos.	**Zone distribution boxes to be equipped**
	For distributing data in an area equipped with 1 to 24 RJ 45 sockets Centralise connections to ensure flexibility and scalability of the installation For installation in false ceilings or raised access floors The boxes connect to the patching enclosure or floor cabinet Connection to an RJ 45 socket with an RJ 45/stripped cord or to a Mosaic RJ 45 socket with copper feedthrough with an RJ 45/RJ 45 cord IP 21 - IK 07 Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards T568A and B marking with colour codes Technical characteristics: polycarbonate cover (PC), polypropylene base (PP), RAL 7035 To be equipped directly with RJ 45 High Density connectors
033796	12 ports to be equipped
033797	24 ports to be equipped

	Cat. 6 High Density RJ 45 connectors
	Set of 6 RJ 45 connectors
033763	UTP
033764	FTP
033765	STP

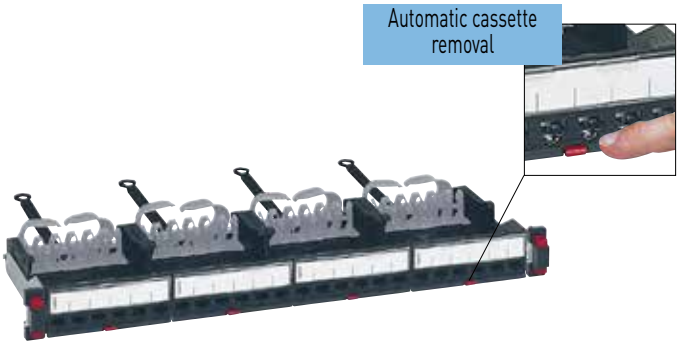
	Cat. 6 cords - RJ 45/stripped
	RJ 45/stripped - straight Plug in and out of the zone distribution boxes and connect to an LCS³ connector of an RJ 45 socket via the stripped side Cables prepared in factory, "ready for wiring" Compliant with ISO/IEC 11801 Ed. 2.0 (2011), EN 50173-1 and EIA/TIA 568 C2 standards
RAL 5015	**Screened F/UTP, impedance 100 Ω**
051796	Length 8 m
051797	Length 15 m
051798	Length 20 m
	Unscreened U/UTP, impedance 100 Ω
051757	Length 8 m
051758	Length 15 m
051759	Length 20 m

Cat.Nos.	**Cat. 6 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 safe connection, plus speed and reliability of connection
LSZH	**Screened F/UTP, impedance 100 Ω**
RAL 5015	
051513	Length 8 m
051514	Length 15 m
051515	Length 20 m
	Unscreened U/UTP, impedance 100 Ω
051510	Length 8 m
051511	Length 15 m
051512	Length 20 m

	Cat. 6 sockets with copper feedthrough
	Cat. 6 UTP - Mosaic
078622	○ White
078626	● Aluminium
	Cat. 6 FTP - Mosaic
078623	○ White
078627	● Aluminium

Legrand cabling system, LCS³ cat. 5

flat patch panels - equipped



033751

Equipped with new-generation Quick-Fix for automatic (screwless) mounting on enclosure and cabinet uprights
Universal mounting on all cabinets or enclosures
Panels ensure automatic earthing of each connector
Equipped with 4 bundles guides fixed at the rear

Cat.Nos.	**Cat. 5e patch panels equipped with 24 RJ 45 connectors**
	19" panels - 1U Equipped with 4 cassettes of 6 pre-fitted Cat. 5e LCS³ RJ 45 connectors Automatic cassette removal by simple pressure Each connector can be removed individually T568A and B marking with colour codes Equipped with rear cable guide to hold cables during maintenance Supplied with coloured labels Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards
	Flat panels 24 RJ 45 connectors - 1U - PoE++
033750	UTP
033751	FTP

Legrand cabling system, LCS³ cat. 5

flat patch panels, to be equipped

033790

033798

033799

Universal mounting on all cabinets or enclosures
Panels ensure automatic earthing of each connector

Cat.Nos.	**19" flat patch panels - to be equipped**
	19" panels - 1U Equipped with rear cable guide to hold cables during maintenance Automatic cassette removal by simple pressure Each connector can be removed individually
033790	**Flat panel with empty cassettes to be equipped with connectors** Equipped with 4 automatically removable cassettes, takes up to 24 Cat. 5e to Cat. 8 RJ 45 connectors
033791	**Empty flat panel to be equipped with cassettes** Takes a maximum of 4 automatically removable cassettes: - copper to be equipped with Cat. 5e to Cat. 8 RJ 45 connectors - fiber optic
033793	**High Density flat panel with empty cassettes to be equipped with connectors** Equipped with 4 High Density cassettes, takes up to 48 Cat. 5e to Cat. 6A RJ 45 connectors

	10" flat patch panels - to be equipped
	10" panels - 1U
033798	Takes up to 6 Cat. 5e to Cat. 8 RJ 45 connectors
033799	Takes up to 12 Cat. 5e to Cat. 6A RJ 45 connectors

Legrand cabling system, LCS³ cat. 5e
angled patch panels to be equipped, connectors

033792

033794

033753

Equipped with new-generation Quick-Fix for automatic (screwless) mounting on enclosure and cabinet uprights
Universal mounting on all cabinets or enclosures
Panels ensure automatic earthing of each connector
Equipped with 4 concentric strand guides fixed at the rear

Cat.Nos.	Angled patch panels - to be equipped
	19" panels - 1U
033792	**Angled patch panel to be equipped with connectors** Takes up to 24 Cat. 5e to Cat. 8 RJ 45 connectors
033794	**High Density angled panel to be equipped with connectors** Takes up to 48 Cat. 5e to Cat. 6A RJ 45 connectors

	Cat. 5e High Density RJ 45 connectors
	Quick-connect connection (no tools required) T568A and B marking with colour codes Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards To be installed in cassettes for flat panels or directly in an angled panel or a zone distribution box to be equipped Set of 6 RJ 45 connectors
033753	UTP
033754	FTP

Legrand cabling system, LCS³ cat. 5e
accessories

033756

033759

033755

033766

033757

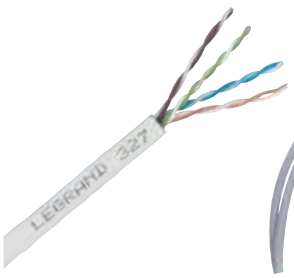
033758

Cat.Nos.	Common accessories for flat and angled panels
	Port blanking modules
033756	Separable blanking plate For covering 1 to 6 ports or 1 to 12 ports individually (High Density solutions)
	Cord management
033759	2 cable guides to be clipped onto new-generation Quick-Fix Provide side cord management Label-holder for identification

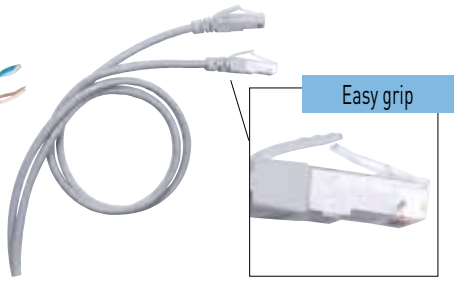
	Specific accessories for flat panels
	Cassette for flat panels to be equipped
033755	Removable empty cassette to be equipped with connectors, takes 6 Cat. 5e to Cat. 8 connectors Can be removed by simple pressing on the cassette, for ease of installation and maintenance For equipping flat panels
	Cassette with shutters for flat panels to be equipped
033766	Removable empty cassette to be equipped with connectors, takes 6 Cat. 5e to Cat. 8 connectors Can be removed by simple pressing on the cassette, for ease of installation and maintenance Equipped with 6 individual shutters to protect RJ 45 connectors contacts For equipping flat panels
	High Density cassette for flat panels to be equipped
033795	Removable empty cassette to be equipped with connectors, takes 12 Cat. 5e to Cat. 6A connectors Can be removed by simple pressing on the cassette, for ease of installation and maintenance For equipping flat panels
	Blanking cassette
033757	To be used to fill gaps in the panel

	Specific accessory for angled panels
	Cover
033758	Optimises air flow management in the enclosure

Legrand cabling system, LCS³ cat. 5e
cables and cords



032750



051640

Cat.Nos		Cat. 5e cables for local networks
		Cable with 4 twisted pairs, 100 Ω LSZH sheath: zero halogen Grey RAL 7035 ANSI/TIA colour code Compliant with ISO/IEC 11 801, EN 50173, ANSI/TIA 568 standards Products conforming to the CPR regulations Euroclass Dca for LSZH cables, Euroclass Eca for PVC cables
LSZH	PVC	**U/UTP - 4 pairs**
032750		Length 305 m Supplied in cardboard box. Weight 9 kg
032853		Length 500 m Supplied on reel. Weight 15 kg
	032751	Length 305 m Supplied in cardboard box. Weight 9 kg
		F/UTP - 4 pairs
032752		Length 305 m Supplied in cardboard box. Weight 12 kg
032850		Length 500 m Supplied on reel. Weight 21 kg
	032753	Length 305 m Supplied in cardboard box. Weight 11 kg

Cat.Nos.	Cat. 5e RJ 45 patch cords and user cords
	RJ 45/RJ 45 - straight Compliant with ISO/IEC 11 801, EN 50173, ANSI/TIA 568 standards Grey RAL 7035
PVC	
	Unscreened U/UTP, impedance 100 Ω
051817	Length 0.5 m
051636	Length 1 m
051637	Length 2 m
051638	Length 3 m
051639	Length 5 m
	Screened F/UTP, impedance 100 Ω
051814	Length 0.5 m
051640	Length 1 m
051641	Length 2 m
051642	Length 3 m
051643	Length 5 m

	Marking kit
051890	Kit of 200 coloured rings for marking RJ 45 cords 4 colors (green/red/yellow/blue). 50 pieces of each color Rings to be clipped onto the patch cords

1: in metre(s)

Legrand cabling system, LCS³ cat. 5e

RJ 45 sockets (Soliroc and Plexo) and other connectors


076552


069557


632779

Can be integrated in any support
Equipped with connectors with quick connection
Take single-core cables from AWG 22 up to AWG 26, and AWG 26 multicore cables
T568A and B marking with colour codes
Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards

Cat.Nos.	Cat. 5e RJ 45 sockets - Mosaic
	Mechanisms to be equipped with support frames and plates
	UTP - 1 module
076551 079451	 ○ White ● Aluminium
	UTP - 2 modules
076554 079454	 ○ White ● Aluminium
	UTP with controlled access - 2 modules
076597	Supplied with 2 keys for 5 sockets ○ White with red shutter
	UTP - 2 x RJ 45 with Soluclip accessory - 3 modules
076541	For snap-on mounting on DLP trunking with 45 mm cover ○ White
	UTP with retractable cord - 4 modules
076530	With integrated retractable cord (0.9 m) Automatically winds back in at the press of a button ○ White
	UTP 45° - 2 modules
076501	○ White
	UTP 45° - 2 x RJ 45 - 2 modules
076502	○ White
	FTP - 1 module
076552 079452	 ○ White ● Aluminium
	FTP - 2 modules
076555 079455	 ○ White ● Aluminium
	FTP with controlled access - 2 modules
076598	Supplied with 2 keys for 5 sockets ○ White with red shutter
	FTP - 2 x RJ 45 with Soluclip accessory - 3 modules
076542	For snap-on mounting on Mosaic trunking with 45 mm cover  ○ White

Cat.Nos.	Cat. 5e Plexo RJ 45 sockets - IP 55 closed flap IK 07
	RJ 45 sockets Protection against water, dust For industrial sites ● Grey
069557 069556	 FTP socket UTP socket
	Adaptor for RJ 45 socket
069581	 RJ 45 to be ordered separately. Guaranteed weatherproof seal (IP 44) with plug inserted ● Grey
	Surface mounting box - 1 or 2 ports
632779	For Keystone connectors For surface mounting installations Can be fixed to a table or used in conjunction with mini-trunking

Audio/video sockets and Mosaic
p. 137-138

Legrand cabling system, LCS³ Cat. 5e

zone distribution box solution

033797

033753

078625

Cat.Nos.	Zone distribution boxes to be equipped
	For distributing data in an area equipped with 1 to 24 RJ 45 sockets Centralise connections to ensure flexibility and scalability of the installation For installation in false ceilings or raised access floors The boxes connect to the patching enclosure or floor cabinet Connection to an RJ 45 socket with an RJ 45/stripped cord or to a Mosaic RJ 45 socket with copper feedthrough with an RJ 45/RJ 45 cord IP 21 - IK 07 Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards T568A and B marking with colour codes Technical characteristics: polycarbonate cover (PC), polypropylene base (PP), RAL 7035 To be equipped directly with RJ 45 High Density connectors
033796	12 ports to be equipped
033797	24 ports to be equipped

	Cat. 5e High Density RJ 45 connectors
	Set of 6 RJ 45 connectors
033753	UTP
033754	FTP

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 safe connection, plus speed and reliability of connection
PVC	
RAL 7035	
	Screened F/UTP, impedance 100 Ω
051503	Length 8 m
051504	Length 15 m
051505	Length 20 m
	Unscreened U/UTP, impedance 100 Ω
051500	Length 8 m
051501	Length 15 m
051502	Length 20 m

	Cat. 5e sockets with copper feedthrough
	Cat. 5e UTP - Mosaic
078620	○ White
078624	● Aluminium
	Cat. 5e FTP - Mosaic
078621	○ White
078625	● Aluminium

WI-FI POE
ACCESS POINT

Improve the quality of internet services

EASY UPGRADE OF YOUR INFRASTRUCTURE

Plug it in, do the quick setup and go!
The Legrand Wi-Fi access point connects directly to an RJ45 socket and receives its own power supply via Power over Ethernet (POE).

EASY INSTALLATION

Up to **80m** in open air*

Up to **20m** inside*

Powered with POWER OVER ETHERNET technology

PoE

EASY CONFIGURATION

- From any device: smartphone (Android, iOS), tablet, PC/MAC
- No separate app required, configuration is done via the browser
- Network secured with a password
- Possibility to create different networks according to your needs by adding a PoE WI-Fi access point (e.g.: visitors, customers, etc.).
- Ready to use in 4 clicks

*Depending on the installation environment.

Legrand cabling system, LCS³

PoE WAP and switches

033523

033492

413111

Cat.Nos.	PoE Wi-Fi Access Point
033523	Plug & play product to be installed on any RJ 45 socket connected to a Power over Ethernet switch Self-powered with PoE Easy configuration with a smartphone or computer (browser based) Possibility to choose Wi-Fi signal strength (only in room or beyond) WPS (Wi-Fi Protected Setup) and On/Off functions White
	PoE Ethernet switches
	Ethernet switches with PoE and PoE+ EndSpan injector (standard IEEE 802.3af and 802.3at) For supplying power to the Ethernet ports of devices (Wi-Fi access point, IP camera, etc) Supplied with power supply
	19" switches
033490	Ethernet switch with 10 RJ 45 ports (8 PoE+ outputs) Gigabit - Manageable
033492	Ethernet switch with 26 RJ 45 ports (24 PoE+ outputs) Gigabit - Manageable
	Tablet switch - 6 ports
033493	Ethernet switch with 6 ports including: - 1 Gigabit RJ 45 and 1 fiber optic SFP uplinks - 4 Gigabit PoE+ RJ 45 outputs Non manageable Whole device power: 65W Max power: 30W per port
	Tablet switches - 5 ports
	Ethernet switches with 5 ports including: - 1 RJ 45 uplink - 4 Gigabit PoE+ RJ 45 outputs Non manageable Whole device power : 58W
413111	EU power supply cord
413113	BS power supply cord

Legrand cabling system
doublers and weatherproof adaptors


032747


053949

Cat.Nos.	Mobile doublers
	Clip into RJ 45 sockets to double up applications
032783	TV/computer network or telephone doubler
032747	Telephone/telephone doubler
032745	Computer network/telephone doubler
032746	L1/L2 telephone doubler
032748	Computer network/computer network doubler

	Weatherproof adaptors
	Plexo adaptors
	IP 55 - IK 07
	Take 2-module Mosaic mechanisms without a support (RJ 45 socket, telephone socket, coded keypad, etc) except special surface mounting type
Grey/White	
069580	Adaptor with smoked flap
069579	Adaptor with smoked flap lockable by means of a special tool
069581	Adaptor for RJ socket ensuring IP 44 sealing of the cable when already connected
091945	Locking tool (used for changing vandal-proof screws)
	Soliroc adaptors
	Used for adapting all functions
	2-module Mosaic mechanisms (except special surface mounting type)
	IK 10 - IP 55
077880	Adaptor with flap
077881	Adaptor without flap
	Hypra adaptor
053949	IP 55 adaptor base

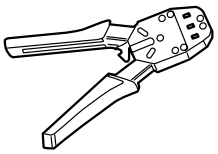
Legrand cabling system, LCS³
accessories


051709


032760

Cat.Nos.	110 tool
033260	110 tool
033261	Replacement blade

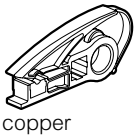
	Crimping tool for RJ 45 plugs
	For crimping RJ plugs
	with 4/6/8/9 contacts
	Ratchet control of crimping mechanism
	Possibility to cut and strip cables
051709	Tool with 3 crimping points
	High resistance steel material



	RJ plugs for round cables - for crimping
	Gold-coated contacts, 1.2 µm
	RJ 11
051701	4 contacts
	RJ 12
051702	6 contacts
	RJ 45 Cat. 5e
051703	8 contacts
051704	9 contacts
	RJ 45 Cat. 6
051710	8 contacts
051711	9 contacts
	RJ 45 sleeves
051706	Black
051707	White

	Cable protection accessories
	Plastic material
	IP 66/67 guaranteed when paired with Cat.Nos 053302
	IP 55 when not connected for base with shutter
	Protection for shielded or unshielded RJ 45 cords to create a Cat. 5 connection
	Compliant with IEC 60603-7 series and IEC 61076-3-106 (version 5) standards
	Compatible with commercially-available products conforming to the aforementioned standards
	Plug
053300	Integrated cable gland with sealing ring and clamping blades
	Toolless assembly
	Can protect RJ 45 cords
	Flush-mounting base
053301	Locking base
	Supplied with Cat. 5e female/female RJ 45 coupler
	Kit
053302	Flush-mounting base + plug
	Protective flap
053303	Fits on base Cat.No 053301

	Stripping tools
	Slit the sheath and release the conductors by rotation
	For twisted pair cables
	Don't damage the conductors
	Stripper
033262	For twisted pair
	Cutting pliers
032760	Cut wires cleanly without damaging the copper



Legrand cabling system, LCS³ fiber optic
cables

032513


032510


032666

Selection chart p. 100-101

Colour code: FOTAG
Compliant with EN 50173-2 and ISO IEC 11801 standards
Packed on a 2000 m reel except for tight-buffer OM4
Tight-buffer: "easy strip"
Other configurations on request

Single-mode OS2 fiber optic cables (9/125 µm) - (OS1 compatible)

For 9/125 µm single-mode installations, OS2 type

Cat.Nos		
Loose tube	Tight-buffer 900 µm	
		Indoor/Outdoor Yellow LSZH sheath Glass strands
032502		4 fibers - Euroclass Dca
032512		6 fibers - Euroclass Dca
032503		8 fibers - Euroclass Dca
032514	032550	12 fibers - Euroclass Dca
032526		12 fibers - Euroclass Cca
032551		24 fibers - Euroclass Dca
032518		24 fibers - Euroclass Cca
		Outdoor Black PE sheath Glass strands for rodent-proofing, reinforced with corrugated steel
032523		4 fibers
032513		6 fibers
032524		8 fibers
032515		12 fibers
032525		24 fibers

Multimode OM4 fiber optic cables (50/125 µm)

For 50/125 µm multimode installations, OM4 type
Suitable for 10 Gb Ethernet networks
Bend insensitive

Loose tube	Tight-buffer 900 µm	
		Indoor/Outdoor Aqua LSZH sheath Glass strands
032543		4 fibers - Euroclass Dca
	032665	6 fibers - Euroclass Dca - 500 m drum
	032666	6 fibers - Euroclass Dca - 1000 m drum
032544		8 fibers - Euroclass Dca
032545		12 fibers - Euroclass Dca
032549		12 fibers - Euroclass Cca
	032667	12 fibers - Euroclass Dca - 1000 m drum
	032668	24 fibers - Euroclass Dca - 1000 m drum
032519		24 fibers - Euroclass Cca - 1000 m drum
		Outdoor Black PE sheath Glass strands for rodent-proofing, reinforced with corrugated steel
032546		4 fibers
032547		8 fibers
032548		12 fibers

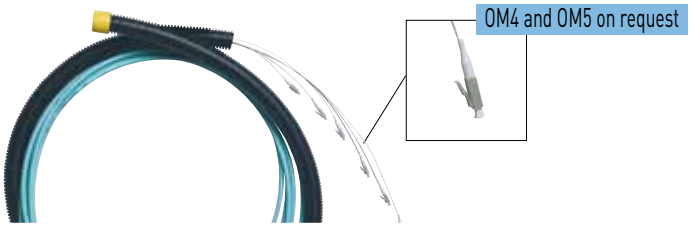
Multimode OM3 fiber optic cables (50/125 µm)

For 50/125 µm multimode installations, OM3 type
Suitable for 10 Gb Ethernet networks
Bend insensitive

Cat.Nos		
Loose tube	Tight-buffer 900 µm	
		Indoor/Outdoor Aqua LSZH sheath Glass strands Euroclass Dca
032537		4 fibers
	032510	6 fibers
032538		8 fibers
032539	032511	12 fibers
032553	032552	24 fibers
		Outdoor Black PE sheath Glass strands for rodent-proofing, reinforced with corrugated steel
032540		8 fibers
032541		12 fibers
032542		24 fibers

1: in metre(s)

Legrand cabling system, LCS³ fiber optic
preterminated links



132041

Selection chart p. 102-103

Supplied with pulling element. In coil up to 50 m, on a small drum between 51 m and 150 m, on a large drum over 151 m and up to 200 m
Connection in fiber optic drawers. OM3 aqua LSZH sheaths. Supplied with test reports
Possible to obtain customised preterminated links: cable type, structure, length, connector type, etc

Cat.Nos.	Core™ SC/SC tight-buffer OM3 links
	6 SC simplex - 6 SC simplex
132001	Length 10 m
132002	Length 20 m
132003	Length 30 m
132004	Length 40 m
132005	Length 50 m
132006	Length 60 m
132007	Length 70 m
132008	Length 80 m
132009	Length 90 m
132010	Length 100 m
132012	Length 120 m
132014	Length 140 m
132016	Length 160 m
132018	Length 180 m
132020	Length 200 m
	12 SC simplex - 12 SC simplex
132021	Length 10 m
132022	Length 20 m
132023	Length 30 m
132024	Length 40 m
132025	Length 50 m
132026	Length 60 m
132027	Length 70 m
132028	Length 80 m
132029	Length 90 m
132030	Length 100 m
132032	Length 120 m
132034	Length 140 m
132036	Length 160 m
132038	Length 180 m
132040	Length 200 m

	Core™ LC/LC tight-buffer OM3 links
	6 LC simplex - 6 LC simplex
132041	Length 10 m
132042	Length 20 m
132043	Length 30 m
132044	Length 40 m
132045	Length 50 m
132046	Length 60 m
132047	Length 70 m
132048	Length 80 m
132049	Length 90 m
132050	Length 100 m
132052	Length 120 m
132054	Length 140 m
132056	Length 160 m
132058	Length 180 m
132060	Length 200 m
	12 LC simplex - 12 LC simplex
132061	Length 10 m
132062	Length 20 m
132063	Length 30 m
132064	Length 40 m
132065	Length 50 m
132066	Length 60 m
132067	Length 70 m
132068	Length 80 m
132069	Length 90 m
132070	Length 100 m
132072	Length 120 m
132074	Length 140 m
132076	Length 160 m
132078	Length 180 m
132080	Length 200 m

Legrand cabling system, LCS³ fiber optic
High Density preterminated links

032441

Selection chart p. 102-103

Supplied on a drum
Micro cables for high density cassettes
Aqua (OM3) and yellow (OS2) LSZH sheaths
Supplied with test reports (photometry)
Other configurations on request

Cat.Nos.	Ultra™ Fan-out/Fan-out preterminated High Density fiber optic links	
	With fan-out (2 mm output) for secure transition between the cable and the ends Low insertion loss for LC connector < 0.15 dB/ connector	
	Fan-out/Fan-out OM3 micro cables	
	Description	Length (m)
032401	6 LC duplex - 6 LC duplex	10
032402	6 LC duplex - 6 LC duplex	20
032403	6 LC duplex - 6 LC duplex	30
032404	6 LC duplex - 6 LC duplex	40
032405	6 LC duplex - 6 LC duplex	50
032411	12 LC duplex - 12 LC duplex	10
032412	12 LC duplex - 12 LC duplex	20
032413	12 LC duplex - 12 LC duplex	30
032414	12 LC duplex - 12 LC duplex	40
032415	12 LC duplex - 12 LC duplex	50
	Fan-out/Fan-out OS2 micro cables	
	Description	Length (m)
032421	6 LC duplex - 6 LC duplex	10
032422	6 LC duplex - 6 LC duplex	20
032423	6 LC duplex - 6 LC duplex	30
032424	6 LC duplex - 6 LC duplex	40
032425	6 LC duplex - 6 LC duplex	50
032431	12 LC duplex - 12 LC duplex	10
032432	12 LC duplex - 12 LC duplex	20
032433	12 LC duplex - 12 LC duplex	30
032434	12 LC duplex - 12 LC duplex	40
032435	12 LC duplex - 12 LC duplex	50

	Ultra™ MTP[1]/MTP[1] High Density preterminated fiber optic links	
	For connecting cassettes in High Density fiber optic panels and Ultra High Density drawers Female MTP[1], A polarity Low insertion loss for MTP[1] connector < 0.35 dB/ connector	
	MTP[1] OM3 micro cables	
	Description	Length (m)
032441	12 MTP[1]-MTP[1] fiber optics	10
032442	12 MTP[1]-MTP[1] fiber optics	20
032443	12 MTP[1]-MTP[1] fiber optics	30
032444	12 MTP[1]-MTP[1] fiber optics	40
032445	12 MTP[1]-MTP[1] fiber optics	50
	MTP[1] OS2 micro cables	
	Description	Length (m)
032451	12 MTP[1]-MTP[1] fiber optics	10
032452	12 MTP[1]-MTP[1] fiber optics	20
032453	12 MTP[1]-MTP[1] fiber optics	30
032454	12 MTP[1]-MTP[1] fiber optics	40
032455	12 MTP[1]-MTP[1] fiber optics	50

1: MTP is a registered trademark of US Conec Ltd

Legrand cabling system, LCS³ fiber optic

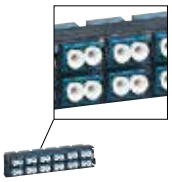
19" fiber optic drawers

032162

032172

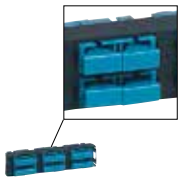
032100

032101



032115

032134



032111

Selection chart p. 96-97

Cat.Nos.	Equipped 19" fiber optic drawers
	Metal 19" pre-equipped fiber optic drawers, 4 cable entries, supplied with screw fixing kit, 2 cable glands (Ø 13.5 and 16 mm), coiling system and splice cassette Panel and optical ports marked on dedicated marking area
	Sliding End stop at a 30° angle Maximum capacity: 48 fibers in LC version, 24 fibers in ST and SC versions Depth 220 mm, height 1 U
032161	SC duplex for 24 multimode fibers
032162	LC duplex for 48 multimode fibers
032163	ST duplex for 24 multimode fibers
032164	SC duplex for 24 single-mode fibers
032165	LC duplex for 48 single-mode fibers
032166	SC APC duplex for 24 single-mode fibers
032167	LC APC duplex for 48 single-mode fibers
	Rotating Supplied with reversible left or right opening Maximum capacity: 72 fibers in LC version, 36 fibers in SC version Depth 260 mm, height 1 U
032171	LC duplex for 72 multimode fibers
032172	SC duplex for 36 multimode fibers
032173	LC duplex for 72 single-mode fibers
032174	SC duplex for 36 single-mode fibers

	Flat and angled 19" modular fiber optic drawers
	Metal 19" modular fiber optic drawers, 8 cable entries, supplied with 2 cable glands (Ø 13.5 and 9 mm), coiling system Equipped with the new-generation Quick-Fix system for automatic (screwless) mounting on enclosure or cabinet uprights Supplied with numbered labels Maximum capacity: 96 fibers in LC version, 48 in SC version or 24 in ST version Depth 290 mm, height 1U
	Sliding, equipped End stop at a 20° angle
032102	SC duplex for 24 multimode fibers
032104	LC duplex for 48 multimode fibers
032106	SC duplex for 24 single-mode fibers
	Sliding, to be equipped with fiber optic blocks Takes any fiber optic block, up to 4 blocks maximum. End stop at a 20° angle
032100	Empty drawer
	Sliding, to be equipped with fiber optic blocks - angled Takes any fiber optic block, up to 4 blocks maximum. End stop at a 20° angle
032101	Empty drawer

Cat.Nos.	Fiber optic blocks
	To be clipped directly onto modular fiber optic drawers to be equipped Cat.Nos 032100/01 or onto fiber optic splice cassette Cat.No 032141
	Single-mode fiber blocks (9/125 µm)
032117	ST block for 6 single-mode fibers
032110	SC duplex block for 6 single-mode fibers
032111	SC duplex High Density block for 12 single-mode fibers
032112	SC APC duplex block for 6 single-mode fibers
032113	LC duplex block for 6 single-mode fibers
032114	LC duplex block for 12 single-mode fibers
032115	LC duplex High Density block for 24 single-mode fibers
032116	LC APC duplex block for 12 single-mode fibers
032133	Single-mode 4 MTP[1] feedthrough adaptor, key up/key down
032119	Single-mode 8 MTP[1] feedthrough adaptor, key up/key down
	Multimode fiber blocks (62.5 and 50/125 µm)
032127	ST block for 6 multimode fibers
032120	SC duplex block for 6 multimode fibers
032121	SC duplex High Density block for 12 multimode fibers
032123	LC duplex block for 6 multimode fibers
032124	LC duplex block for 12 multimode fibers
032125	LC duplex High Density block for 24 multimode fibers
032134	Multimode 4 MTP[1] feedthrough adaptor, key up/key down
032118	Multimode 8 MTP[1] feedthrough adaptor, key up/key down
032136	LC duplex block for 6 multimode fibers - aqua
032137	LC duplex block for 12 multimode fibers - aqua

	RJ 45 copper block for fiber optic drawer
032132	To be clipped directly onto modular fiber optic drawers to be equipped Cat.Nos 032100/01 Allows the mixing of fiber optic and copper Takes up to 5 RJ 45 connectors

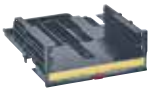
	Accessories for fiber optic drawer to be equipped
	Accessory for receipt of a fan-out
032128	To be clipped onto the back of the drawer Enables the entry of preterminated links
	Blanking plate
032129	Blanking plate
	Cassette for pigtails
032130	Capacity: 24 fibers
	Coiling kit
032131	1 accessory

1: MTP is a registered trademark of US Conec Ltd

Legrand cabling system, LCS³ fiber optic

19" High Density fiber optic panels (1/2/4 U) and patching kits

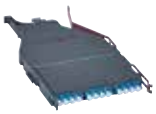
Panel 032176 equipped with support 032138 and slim cassettes 032169/70



032138

032169

OM5 on request



032170

Selection chart p. 98-99

Cat.Nos.	19" High Density fiber optic panels
	Panels to be equipped with cassettes
	Equipped with Quick-Fix system for automatic (screwless) mounting on enclosure or cabinet uprights To be equipped directly with a maximum of 4 automatically removable cassettes or 4 supports for slim cassettes Cat. No 032138 per U Maximum capacity per U: 48 fibers in SC version, 24 fibers in ST version or 96 fibers in LC version 2U and 4U versions equipped with door and cord management at the front, and with cable management at the back
032175	1 U height, depth 182 mm
032176	2 U height, depth 393 mm
032177	4 U height, depth 393 mm
	Accessories for panels
032178	Front cord management kit for 1 U panel Fits on 1 U modular panel Cat.No 032175 2 side cord guides and front door with integrated marking to ensure correct front and side cord management Cord holder to be mounted on cassette to make it easier to pass cords through the side
032146	Rear cable management accessory Fits on 1 U panel Cat. No 032175
032128	Accessory for receipt of a fan-out To be clipped onto the back of the drawer Enables the entry of preterminated links
032122	Copper cable management accessory
032126	Set of 4 cord holders To be mounted on any cassette to make it easier to pass cords through the side
032105	Rear accessory for fixing 4 cable glands

Ultra™ preterminated MTP[1] High Density cassettes (MPO compatible)

For installation in modular panels
Cat. Nos 032175/76/77 and in Zero-U kit Cat. No 032103
Slim cassettes to be installed with support Cat. No 032138
Sliding cassettes which can be removed automatically by simply pressing them, simplifying installation and maintenance
Removable from the front and back
Multimode - Insertion Loss Max/Random[2]: 0.55 dB
Single-mode - Insertion Loss Max/Random[2]: 0.6 dB
Prewired, equipped at the rear with one or two male MTP[1] connectors with 12 fibers
LC or SC connectors at the front

	Ultra™ cassettes
032142	Multimode OM4 cassette (50/125 µm) 24 LC fibers, A/C polarity
032148	Multimode OM4 cassette (50/125 µm) 12 LC fibers, A/C polarity
032143	Multimode OM4 cassette (50/125 µm) 12 SC fibers, A/C polarity
032159	Multimode OM4 cassette (50/125 µm) 12 SC fibers, universal
032144	Single-mode OS2 cassette (9/125 µm) 24 LC fibers, A/C polarity
032149	Single-mode OS2 cassette (9/125 µm) 12 LC fibers, A/C polarity
032145	Single-mode OS2 cassette (9/125 µm) 12 SC fibers, A/C polarity
032160	Single-mode OS2 cassette (9/125 µm) 12 SC fibers, universal

1: MTP is a registered trademark of US Conec Ltd
2: When mated with the same Legrand range (Ultra & Core) trunks and patch cords

Cat.Nos.	Preterminated MTP[1] High Density cassettes (MPO compatible) (continued)
	Ultra™ slim cassettes
032138	Support for High Density slim cassettes Takes up to 2 High Density slim cassettes Cat.Nos 0 321 68/69/70 and up to 2 blanking cassettes Cat.No 032139 or 1 cassette + 1 blanking cassette Possibility to mix slim single-mode and multimode cassettes on the same support
032169	Slim multimode OM4 cassette (50/125 µm) 12 LC fibers, Universal polarity
032168	Slim multimode OM3 cassette (50/125 µm) 12 LC fibers, Universal polarity
032170	Slim single-mode OS2 cassette (9/125 µm) 12 LC fibers, Universal polarity
032139	Slim blanking module to be mounted (x2) on support Cat.No 032138 to fill gaps in the panel

Core™ pre-equipped cassettes

For installation in modular panels
Cat. Nos 032175/76/77 and Zero-U kit Cat.No 032103
Pre-equipped cassettes with fitted fiber optic block + sets of 6 or 12 OM3 pigtails
Sliding cassettes which can be removed automatically by simply pressing them, simplifying installation and maintenance
Removable from the front

	Pre-equipped cassettes for multimode installation (50/125 µm)
032180	Equipped with 1 SC duplex block for 6 fibers
032181	Equipped with 1 LC duplex block for 6 fibers
032182	Equipped with 1 SC duplex block for 12 fibers
032183	Equipped with 1 LC duplex block for 12 fibers
	Pre-equipped cassettes for single-mode installation (9/125 µm)
032184	Equipped with 1 SC duplex block for 6 fibers
032185	Equipped with 1 LC duplex block for 6 fibers
032186	Equipped with 1 SC duplex block for 12 fibers
032187	Equipped with 1 LC duplex block for 12 fibers

Cassettes to be equipped and blanking plate

For installation in modular panels
Cat. Nos 032175/76/77 and Zero-U kit
Cat. No 032103
Sliding cassettes which can be removed automatically by simply pressing them, simplifying installation and maintenance
Removable from the front

	Fiber optic splice cassette
032141	Takes any modular fiber optic block
	Blanking cassette
033757	To be used to fill gaps in the panel
	Copper cassette to be equipped
032155	Takes six Cat. 5e, 6 and 6A copper connectors

Patching kits

	1 U to 4 U patching kit
032189	Compatible with all LCS³ fiber optic and copper 19" panels Supplied with top protection, cable guides and specific accessories for installation on cable trays, wire meshed cable trays (Cablofil) and cabinets
	Zero-U patching kit
032103	To bring few fiber optic or copper connections outside 19" panels Takes 1 cassette (fiber optic preterminated cassettes, pre equipped cassettes, fiber optic splice cassette or RJ 45 copper cassette) Supplied with a comprehensive range of accessories for fixing in or outside enclosures (raised access floors, cable trays, walls, ceiling)

LEGRAND
NEXT LEVEL
DATA CENTER SOLUTIONS!

A data center must accommodate IT infrastructure in the most efficient way possible. Infrastructure needs the space to grow and evolve with new circumstances, technology, and user requirements.

Legrand offers an extremely flexible and modular cabinet platform that grows and evolve with you, no matter what your requirements are now and in the future.

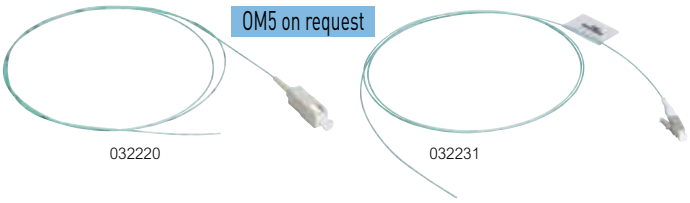
SMART
Unlimited possibilities

SECURE
Keep your data safe

SOLID
Next level reliability

SUSTAINABLE
Next level energy efficiency

Legrand cabling system, LCS³ fiber optic
pigtails, glue-on connectors and fan-out units

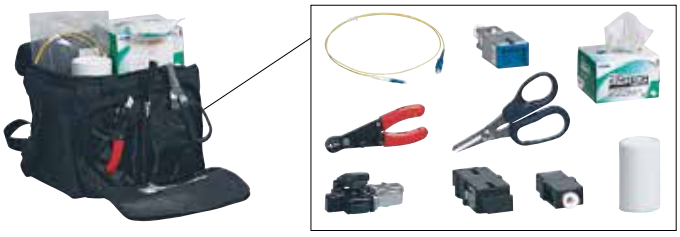


032220 032231

Selection chart p. 100-101

Cat.Nos		
		Core™ pigtails
		LSZH For making quick, reliable and high-performance fiber optic cable connections on site: - OM2/OM3/OM4 IL Typical/Master = 0.15 dB - OS2 IL Typical/Master = 0.18 dB Compatible with all commercially-available splicers
1 m	2 m	**50/125 µm - OM3 (PC)**
032220	032223	SC connectors
032221	032224	LC connectors
032222		ST connectors
		50/125 µm - OM4 (PC)
032230	032233	SC connectors
032231	032234	LC connectors
032232		ST connectors
		9/125 µm - OS2 (APC or UPC) - OS1 compatible
032240	032245	SC-APC connectors
032241	032246	SC-UPC connectors
032242	032248	LC-APC connectors
032243	032247	LC-UPC connectors
032244	032249	ST-UPC connectors
		Sets of 12 LC pigtails
		1m length - 12 different colors
032624		12 OS2 LC-UPC pigtails
032626		12 OM3 LC-UPC pigtails
032671		12 OM4 LC-UPC pigtails
		Heat-shrinkable sleeve for pigtails
032744		40 mm - pack of 50 sleeves
		50/125 and 62,5/125 µm glue-on connectors
		Supplied with 900 µm sleeve Connectors with ceramic ferrule Typical attenuation: 0.3 dB
033147		SC connectors
033100		LC connectors
		Fan-out units
		For 900 µm sheathing of optical fibers Take 250 µm fiber diameters
033048		6-fiber fan-out unit
033049		12-fiber fan-out unit

Legrand cabling system, LCS³ fiber optic
case and quick-connect connectors



032270

032272

032273

032275

032283

032281

032285

Cat.Nos	
	Tool case for preparing optical fiber for quick-connect fiber optic connectors
032270	Provides the tools required for preparing optical cables, for carrying out initial tests of the connection of fibers to connectors and accessories for easy connection in all situations Comprises: - Precision cleaver - Kevlar stripping and cutting tool - Visual fault locator - Installation instructions and video - Accessories (cleaners, felt tip pen, bin, etc)
	Quick-connect connectors
	Connection can be made with case Cat.No 032270 Quick-connect, reliable and reusable up to 5 times To be used to lock the fiber inside the connector An indicator light is used to test the connection No glue or polishing needed Can be installed on 900 µm fiber optics For 250 µm fiber, use the special tubes supplied with the connectors; typical IL: multimode OM3/OM4 = 0.1 dB and single-mode OS2 = 0.2 dB (PC) and 0.3 dB (APC)
	OM3/OM4 multimode connectors Set of 12 connectors
032271	LC PC 50/125 µm, 900/250 µm
032272	SC PC 50/125 µm, 900/250 µm
	OS2 single-mode connectors Set of 12 connectors
032273	LC UPC 9/125 µm, 900/250 µm
032274	SC UPC 9/125 µm, 900/250 µm
032275	SC APC 9/125 µm, 900/250 µm
	Precision cleaver for updating case Cat.Nos 032690
032280	Enables precision-cutting of fiber optics and the use of quick-connect connectors Cat.Nos 032271 to 032275 with case Cat.No 032690
	Fiber optic cleaning accessories
032283	MPO/MTP[1] ferrule cleaner
032281	LC ferrule cleaner (PC/APC)
032282	SC ferrule cleaner (PC/APC)
032284	LC replacement cartridge
032285	SC replacement cartridge
032276	Fiber stripper
032277	Wipes
032278	Cleaning spray

1: MTP is a registered trademark

Legrand cabling system, LCS³ fiber optic

Core™ fiber patch cords

Selection chart p. 100-101

Fitted at each end with 2 connectors with ceramic ferrule
Individually packed and tested (report supplied)
Max. optical losses/Master: 0.25 dB
LSZH Zipcord sheath

Cat.Nos.	OS2 single-mode fiber optic cords (9/125 µm)
	For 9/125 µm single-mode installations, OS2 type Yellow sheaths
	SC/SC duplex cords
032600	Length: 1 m
032601	Length: 2 m
032602	Length: 3 m
	SC/LC duplex cords
032603	Length: 1 m
032604	Length: 2 m
032605	Length: 3 m
	LC/LC duplex cords
032628	Length: 0.5 m
032606	Length: 1 m
032607	Length: 2 m
032608	Length: 3 m
032629	Length: 5 m
	OM3 multimode fiber optic cords (50/125 µm)
	For 50/125 µm multimode installations, OM3 type Aqua sheaths
	SC/SC duplex cords
032609	Length: 1 m
032610	Length: 2 m
032611	Length: 3 m
	SC/LC duplex cords
032612	Length: 1 m
032613	Length: 2 m
032614	Length: 3 m
	LC/LC duplex cords
032615	Length: 1 m
032616	Length: 2 m
032617	Length: 3 m
	OM4 multimode fiber optic cords (50/125 µm)
	For 50/125 µm multimode installations, OM4 type Aqua sheaths
	SC/SC duplex cords
032260	Length: 1 m
032261	Length: 2 m
032262	Length: 3 m
	SC/LC duplex cords
032263	Length: 1 m
032264	Length: 2 m
032265	Length: 3 m
	LC/LC duplex cords
032266	Length: 1 m
032267	Length: 2 m
032268	Length: 3 m

Legrand cabling system, LCS³ fiber optic

Ultra™ fiber patch cords

Selection chart p. 100-101

Fitted at each end with 2 connectors with ceramic ferrule
Individually packed and tested (report supplied)
Max. optical losses/Master: 0.15 dB
LSZH Zipcord sheath

Cat.Nos.	OS2 single-mode fiber optic cords (9/125 µm)
	For 9/125 µm single-mode installations, OS2 type Yellow sheaths
	SC/SC duplex cords
032527	Length: 1 m
032528	Length: 2 m
032529	Length: 3 m
	SC/LC duplex cords
032530	Length: 1 m
032531	Length: 2 m
032532	Length: 3 m
	LC/LC duplex cords
032533	Length: 1 m
032534	Length: 2 m
032535	Length: 3 m
032536	Length: 5 m
	LC/LC Uniboot duplex cords
	Reversible polarity
032686	Length: 1 m
032687	Length: 2 m
032688	Length: 3 m
032689	Length: 5 m
032692	Length: 10 m
	OM4 multimode fiber optic cords (50/125 µm)
	For 50/125 µm multimode installations, OM4 type Aqua sheaths
	SC/SC duplex cords
032630	Length: 1 m
032631	Length: 2 m
032632	Length: 3 m
	LC/LC duplex cords
032633	Length: 0.5 m
032634	Length: 1 m
032635	Length: 2 m
032636	Length: 3 m
032637	Length: 5 m
	LC/LC Uniboot duplex cords
	Reversible polarity
032695	Length: 0.5 m
032696	Length: 1 m
032697	Length: 2 m
032698	Length: 3 m
032699	Length: 5 m

Legrand cabling system, LCS³ fiber optic
feedthrough sockets


078616


078617


078618


078614

Cat.Nos.	Fiber optic feedthrough sockets
	Equipped with a duplex feedthrough To be used to connect two fibers (equipped with their connector) Supplied with protection caps Equipped with a transparent marker-holder 2 modules
078616	**2 x ST socket** Bayonet connection (STII compatible)  ○ White
078617	**2 x SC socket** Push-pull connection  ○ White
078618	**2 x LC socket** Push-pull connection  ○ White
078614 079415L 079114L	**2 x SC/APC socket** Push-pull connection With shutters  ○ White ◉ Aluminium ● Matt Black

The right system to meet your needs

A wide range of technologies (HDMI, Display Port, HD15, Jack, RCA) to suit the location and the user requirements.


■ MediaHub


■ HDMI preterminated female socket


■ Cords and cables

- **Quick installation**
- **Easy connection**
- **Optimum performance**

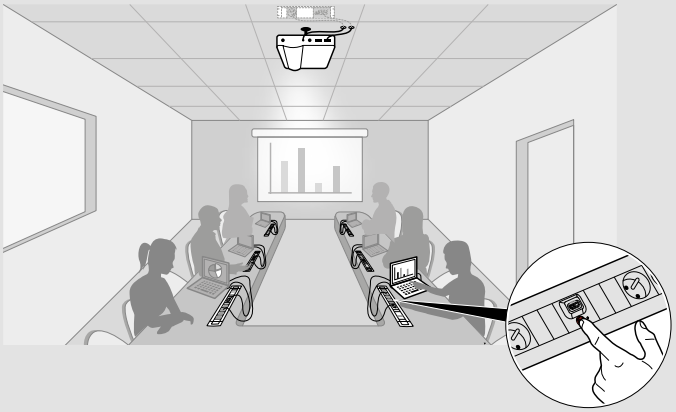
Audio/video system
audio/video sockets

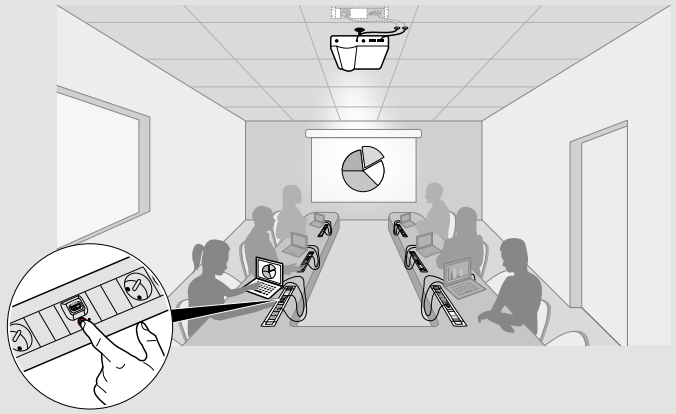
078912

For technical information, **see e-catalogue**

Cat.Nos.	**Multiparticipant HDMI audio/video projection**
Mosaic	**Selector switch transmitters**
078912	 Allows different participants in the room to play the presentation on their PC by pressing the control takeover button without disconnecting the video projector cable For use with other transmitters (up to 8 max.) and a receiver connected to the video projector. High Speed HDMI® with Ethernet cords are used for connection (not supplied, see p. 147) 2 modules
078913	**Receivers**  Transmits audio/video from the transmitters to the video projector and supplies power to the receivers. The receiver and the first transmitter are connected by a High Speed® Ethernet cable (not supplied, see p. 147) 24 V power supply (supplied) 2 modules

Multiparticipant HDMI audio/video projection





Audio/video system
audio/video sockets (continued)


078778


078979L


051738


078777


078799

Type-A HDMI sockets

For transmitting High Definition digital audio/video streams between a source (computer, DVD or Blu-Ray player, etc) and a compatible receiver (TV, video projector, etc)
Max. length between 2 sockets: 10 m

HDMI 2.0 preterminated sockets - 1 module
Equipped with a 15 cm cord and 2 female connectors

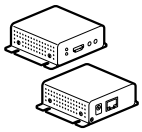
Cat.Nos. Mosaic	
078778	○ White
079378	● Aluminium
079478L	● Matt Black

HDMI 2.0 preterminated sockets - 2 modules

078979L	○ White
079279L	● Aluminium
079479L	● Matt Black

HDMI audio/video extender

Cat.Nos. 051738



For connecting HDMI terminals up to 60 m apart
The kit comprises transmitter and receiver units as well as power supplies
The transmitter and receiver are linked by an RJ 45/RJ 45 cable (not supplied)
Compatible with 4K, 3D, EDID and HDCP
Infrared controller included
Certified HDBaseT

Display Port sockets

For transmitting High Definition digital audio/video streams between a source (laptop computer, DVD or Blu-Ray player, etc) and a compatible receiver (video projector, TV, etc)
Max. length between 2 sockets: 10 m

Preterminated sockets - 1 module
Equipped with a 15 cm cord and 2 female connectors

Cat.Nos. Mosaic	
078791	○ White

Female HD15 sockets

For transmitting analogue video streams between a source (computer) and a compatible receiver (video projector, TV, computer screen, etc)
VGA to UXGA resolution
Max. length between 2 sockets: 15 m

Preterminated sockets - 1 module
Equipped with a 15 cm cord and 2 female connectors

Cat.Nos. Mosaic	
078777	○ White
079377	● Aluminium

Screw-type sockets - 2 modules

078757[1]	○ White

Screw-type sockets + 3.5 mm Jack - 2 modules

078774	○ White

Solder-type sockets - 1 module

078772	○ White

Audio/video cords, **See p. 139-140**

Multiparticipant HDMI audio/video projection, **See p. 136**


078779


078747


078754


079255


078760


078750


078776

Cat.Nos.

3.5 mm female Jack sockets

For making audio links

Preterminated sockets - 1 module

Mosaic
078779
079379
079579L

Equipped with a 15 cm cord and 2 female connectors

○ White
● Aluminium
● Matt Black

Screw-type sockets - 1 module

078764
079564L

○ White
● Matt Black

Solder-type sockets - 1 module

078773

○ White

2 female RCA sockets

Provide the stereo audio link for any peripheral device such as a DVD player, camera, video recorder, etc
1 module

Preterminated

Mosaic
078747

Equipped with a 15 cm cord and 2 female connectors

○ White

Connection via screw terminals

078753

○ White

3 female RCA sockets

Provide the stereo audio link and composite video for any peripheral device such as a DVD player, camera, video recorder, videoconferencing, etc.
1 module

Connection via screw terminals

Mosaic
078754
079254

○ White
● Aluminium

Cat.Nos.

3-pole XLR sockets

Provide the stereo link for any peripheral device, microphone, amplifier, mixing console, etc
Recommended cable: 1 shielded audio pair 0.14 mm² to 0.50 mm²
Max. cable length: 50 m (without amplifier)
Fast screw connection
2 modules

Mosaic
078755
079255
079555L

Female sockets

○ White
● Aluminium
● Matt Black

Male sockets

078756

○ White

Speakon socket - 4 contacts

To be used to connect powered speakers
Recommended cable: 2 audio pairs 4 mm² max.
Max. cable length: 50 m (without amplifier)
2 modules

Preterminated

Mosaic
078760

○ White

Loudspeaker sockets

For loudspeaker stereo audio link
4 mm² terminal

Sockets - 1 module

Mosaic
078750
079250
079550L

○ White
● Aluminium
● Matt Black

Sockets - 2 modules

078751
079551L

○ White
● Matt Black

100 V line attenuators

25 W - 2 modules
To be used to control the power from a 100 V PA system line

Mosaic
078776

○ White

Female BNC 75 sockets - 1 module

Provide the composite video link for any peripheral device such as a DVD player, camera, video recorder, etc.

Mosaic
078758

○ White

USB Data socket,
See p. 140

Audio/video system

HDMI cords and adaptors, HD15 cords and audio cords

051733

051727

Cat.Nos	HDMI cords, booster and adaptors
	High Speed HDMI® cords with Ethernet For connecting an HDMI socket to the audiovideo terminal (TV, DVD or Blu-Ray player, Home Cinema, games console, etc) HDMI 2.0 cords Support 4K and 1080P video resolution Gold-plated connectors
Plastic bag	
051732	Length 1 m
051733	Length 2 m
051734	Length 3 m
051727	Length 5 m
051735	Length 7 m
	Standard HDMI® cords with Ethernet For connecting an HDMI socket to the audio video terminal (TV, DVD or Blu-Ray player, Home Cinema, games console, etc) HDMI 2.0 cords Support 1080i and 720P video resolution Gold-plated connectors
051720	Length 10 m
051736	Length 15 m

HDMI extender
p. 137

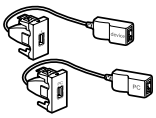
Audio/video system
USB Type-C adaptors and cords, data cords and cables

032781

Cat.Nos	Cables
032781	**VGA cable** Length 20 m For full pin connection of HD15 sockets at a distance of up to 15 m

Audio/video system
USB Data and SUB D data sockets

078748

Cat.Nos	Female USB Data sockets
Mosaic 078746	For connecting USB devices (printer, scanner, external hard drive, interactive panel) 1 module **Preterminated - USB 2.0** Max. cable length: 5 m Recommended cable: USB A Equipped with cable length 15 cm  ○ White
078761	**Screw-type - USB 2.0** Max. cable length: 5 m Recommended cable: USB A Connection using screw terminal blocks with 1 mm² cross-section  ○ White
Mosaic 078748	**Female USB Data Type-A extender - for data transfer**  ○ White For connecting a USB peripheral (keyboard, mouse, digital control panel, etc) to a source (computer) located more than 5 m away (up to 30 m) The kit contains a transmitter (1 module) and a receiver (1 module) The transmitter and receiver are linked by an RJ 45/ RJ 45 cable (not supplied)
Mosaic 078765	**3 female RCA sockets**  ○ White 2 modules 9 contacts with screw-type connector for RS 232 serial link

HDMI extender
p. 137

Linkeo 19" freestanding cabinets

cabinets and equipment

646764

646403

646430

Linkeo 19" cabinets

IP 20 – IK 08 baying cabinets
Reversible flat screen-printed safety glass door
Removable side and rear panels with automatic equipotential bonding
All 4 sides can be locked with a key
Equipped with 2 x 19" uprights with U marking and adjustable depth
Pre-cut cable entries (top and bottom)
To be fitted with brush cable entry Cat.No 646428
Cut-out at the top for fan kit
Equipped with levelling feet
Loading capacity: 400 kg
Anthracite grey RAL 7016

Single front door

Cat.Nos Ready-assembled	Cat.Nos Flatpack	Capacity	Height (mm)	Width (mm)	Depth (mm)
646750	646775	24U	1226	600	600
646751	646776	24U	1226	800	800
646755	646780	33U	1626	600	600
646756	646781	33U	1626	800	800
646760	646785	42U	2026	600	600
646761	646786	42U	2026	600	800
646762	646787	42U	2026	600	1000
646763	646788	42U	2026	800	600
646764	646789	42U	2026	800	800
646765	646790	42U	2026	800	1000
646773	646798	47U	2248	800	800
646774	646799	47U	2248	800	1000

Extension cabinet with single front door

No side panels
Supplied with baying kit

Cat.Nos		Capacity	Height (mm)	Width (mm)	Depth (mm)
646770	646795	42U	2026	800	800

Double front door

Cat.Nos	Capacity	Height (mm)	Width (mm)	Depth (mm)
646766	42U	2026	800	600
646767	42U	2026	800	800
646768	42U	2026	800	1000

Linkeo baying kits

Cat.Nos	
646337	For joining 2 x Linkeo 19" cabinets

Linkeo 19" uprights

Set of 2 additional 19" uprights

Cat.Nos	
646340	24U
646341	33U
646342	42U
646343	47U

Linkeo plinths

Metal plinths consisting of 4 corner blocks and 4 removable solid traps
Height 100 mm
Anthracite grey RAL 7016
For cabinets width x depth (mm):

Cat.Nos.	
646400	600 x 600
646401	600 x 800 or 800 x 600
646402	600 × 1000
646403	800 × 800
646404	800 × 1000

Casters

Cat.Nos	
046482	Set of 4 pivoting casters, 2 of which have brakes Total permissible load on the 4 casters: 500 kg

Linkeo fan kits

Integrated thermostat, adjustable from -10 to +80°C
2.5 m power supply cord with 2P+E plug, 230 V~. Anthracite grey RAL 7016

Cat.Nos	
646430	2 fans
646431	4 fans

Linkeo cable management

Brush cable entry
To fit on top and bottom pre-cut cable entries

Cat.Nos	
646428	Set of brush seals

Vertical cable trays
Side or rear mounting on structure

Cat.Nos	
646420	For 33U cabinet
646421	For 42U cabinet
646422	For 47U cabinet

Cable management ring
For cabinet width 800 mm. Fixes onto 19" uprights.
Usable dim.: 65 x 145 mm. Black RAL 9005

Cat.Nos	
646425	Set of 6 metal rings

Vertical cable managers
For cabinet width 800 mm
Set of 2 vertical panels to manage cords at the front along the whole height of the cabinet with brush feedthroughs and fingers for holding cords in place every 1U

Cat.Nos	
646426	For 42U cabinets
646427	For 47U cabinets

PDU support

Mounted at the back of the cabinet
For vertical mounting of 19" and Zero-U PDUs

Cat.Nos	
646415	For 42U cabinets
646416	For 47U cabinets

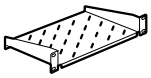
Linkeo 19" freestanding cabinets

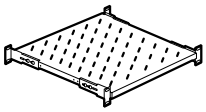
646506

646501

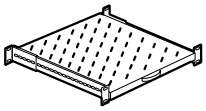
646520

Cat.Nos	Linkeo fixed shelves
	Black RAL 9005 Screw fixing
	Projecting mounting on 2 x 19" uprights Height 2U. Max. load: 15 kg
646501	Shelf depth 200 mm
646502	Shelf depth 360 mm
	Mounting on 4 x 19" uprights Height 1U Max. load: 50 kg
646505	Shelf depth 425 mm For depth 600 mm
646506	Shelf depth 625 mm For depth 800 mm
646507	Shelf depth 825 mm For depth 1000 mm





	Linkeo telescopic shelves
	Screw fixing on 4 x 19" uprights. Height 1U Max. load: 30 kg. Black RAL 9005
646508	Shelf depth 425 mm For depth 600 mm
646509	Shelf depth 625 mm For depth 800 mm
646510	Shelf depth 825 mm For depth 1000 mm



	19" management panels
	Fitted with cable guide rings
646520	1U
646521	2U

Flatpack solution

Easy to carry
Easy to store
Easy to handle
Easy to assemble
- 16 minutes/1 person
- dedicated installation sheet

High-protection packaging (stackable)
Note:
- Flatpacked cabinets are exactly the same as ready-assembled ones. The only difference is the packaging.

Made-to-measure solutions

1 Choose the size

Capacity	24U	33U	42U	47U
Width	600 or 800 mm			
Depth	600, 800 or 1000 mm			

2 Choose the colour

3 Choose the openings

Front and rear options

Doors in single- or double-door versions
- screen-printed glass, microperforated metal, solid metal, etc.(1)

1: To discover the full range of possibilities, please contact your Legrand representative.

With or without side panels

4 Choose the equipment to be factory-mounted
- cable managers
- fans
- plinths
- shelves
- fibre and copper patch panels

Linkeo 19" and 10" wall-mounting cabinets


646262


646221


646230


033798


046223


646801

IP 20 - IK 08
Equipped with:
- reversible flat screen-printed safety glass door with integrated lock
- 2 x 19" uprights, with U marking and adjustable in depth
- 3 pre-cut cable entries (top, bottom and rear)
- 1 brush seal for cable entry
- top perforations for natural ventilation

Anthracite grey RAL 7016

Linkeo 19" fixed cabinets

Fixed side panels

Delivered ready-assembled
Side panels with automatic earthing

Cat.Nos Depth 450 mm	Cat.Nos Depth 600 mm	Capacity	Height (mm)	Width (mm)	Loading capacity (kg)
646200	646210	6U	359	600	18
646201	646211	9U	492	600	27
646202	646212	12U	625	600	36
646203	646213	15U	759	600	45
646204	646214	18U	892	600	54
646205	646215	21U	1025	600	63

Removable side panels

For easy access at the side of the cabinet
Opening with a lock (same key as the door).
Delivered flat-packed. Supplied with earthing kit.

Cat.Nos Depth 450 mm	Cat.Nos Depth 600 mm	Capacity	Height (mm)	Width (mm)	Loading capacity (kg)
646250	646260	6U	359	600	18
646251	646261	9U	492	600	27
646252	646262	12U	625	600	36
646253	646263	15U	759	600	45
646254	646264	18U	892	600	54
646255	646265	21U	1025	600	63

Linkeo 19" pivoting cabinets

Consisting of:
- plinth (wall fixing), able to take a 19" PDU
- pivoting body allowing free access to the rear of the cabinet to facilitate installation and maintenance. Reversible pivoting direction. Delivered ready-assembled.

Side panels with automatic earthing

Cat.Nos Depth 600 mm	Capacity	Height (mm)	Width (mm)	Loading capacity (kg)
646221	9U	492	600	27
646222	12U	625	600	36
646223	15U	759	600	45
646224	18U	892	600	54
646225	21U	1025	600	63

Equipment for 19" cabinets

Linkeo 19" uprights
Set of 2 additional 19" uprights
For installation at the back of the cabinet.

646242 12U
646243 15U
646244 18U
646245 21U

Casters

646248 Set of 4 casters for pivoting cabinet

Linkeo fan kit

646238 Kit contains:
- 2 fans
- 1 thermostat
- switch

Supplied with 2.3 m cable
230 V~ - 50/60 Hz power supply

Equipment for 19" cabinets (continued)

Linkeo fixed shelves
Screw fixing (projecting) on 2 x 19" uprights
Height 2U
Max. load: 15 kg
Black RAL 9005

646501 Shelf depth 200 mm
For cabinets depth 400, 450 and 600 mm

646502 Shelf depth 360 mm
For cabinets depth 450 and 600 mm

19" management panels
Fitted with cable guide rings

646520 1U
646521 2U

Linkeo 10" cabinets

Compact cabinet, suitable for small business applications
Delivered ready-assembled
Side panels with automatic earthing

Cat.Nos Depth 300 mm	Capacity	Height (mm)	Width (mm)	Service load (kg):
646230	6U	359	370	18

Equipment for 10" cabinets

Flat patch panel with 6 connectors - 1U to be equipped

033798 Takes up to 6 Cat. 5e to Cat. 8 RJ 45 connectors
10" panel - 1U

Flat patch panel with 12 connectors - 1U to be equipped

033799 Takes up to 12 Cat. 5e to Cat. 6_A RJ 45 connectors
10" panel - 1U

Fixed shelf 1U

046223 Depth 120 mm
Max. load: 10 kg
Black RAL 9005. Supplied with screws and cage nuts

Fan
2.5 m power supply cable

046260 230 V~ fan

Thermostat

034848 Adjustable from 5 to 60°C, 230 V~, 50/60 Hz
NC contact (5 A) and NO contact (10 A)
Magnetic mounting

10" PDUs (Power Distribution Units)
230 V~ - 50/60 Hz power supply.
Aluminium case height 1U
End caps with metal brackets
Integrated cable guide
Quick fixing (no screws) on 19" upright

646801 Block of 4 x 2P+E outlets, black, at a 55° angle with safety shutter, German standard
1 m power supply cord with 16 A 2P+E French/German plug

646800 Block of 4 x 2P+E sockets, black, at a 55° angle with safety shutter, French standard
1 m power supply cord with 16 A 2P+E French/German plug

646898 To be equipped
Capacity: 8 Mosaic modules

Linkeo 19" vertical cabinet

646240

IP20 – IK 08
Compact cabinet, suitable for small business applications or floor distributors
Equipment mounted vertically
Delivered ready-assembled
Equipped with:
- Flat metal door with integrated lock
- 2 x 19" uprights, 3U at the front and 1U at the rear (for mounting the PDU)
- 1 brush seal for top cable entry
- top perforations for natural ventilation

Supplied with earthing kit
Anthracite grey RAL 7016

Cat.Nos	Linkeo 19" vertical cabinet			
	Compact cabinet, suitable for small business applications Delivered ready-assembled	Capacity	Height (mm)	Width (mm)
Depth 600 mm 646240		3U + 1U	569	538

	Thermal management
	Fan
	2.5 m power supply cable
046260	230 V∿ fan
	Thermostat
034848	Adjustable from 5 to 60°C, 230 V∿, 50/60 Hz NC contact (5 A) and NO contact (10 A) Magnetic mounting

19" Bati-rack

046396 + 2 x 046397

046397

646501

646520

Technical characteristics **p. 15**

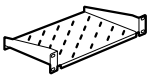
Cat.Nos	19" Bati-rack						
	For housing 19" equipment in an air-conditioned, secure, dust-free environment Comprises 2 or 4 x 19" uprights With levelling feet The 4-upright bati-rack takes shelves and fixed runners for cabinets depth 800 mm Delivered flatpacked RAL 7035	Capacity	Height[1] (mm)	Width (mm)	Depth (mm)	Loading capacity (kg)	Number of uprights
046395		42U	1965	550	640	300	2
046396		42U	1965	550	820	300	4

	Cable management sleeve
	Closed vertical feedthrough Reversible door For fixing on the right or left of 19" uprights RAL 7035
046397	Sleeve

	Roof
046498	Roof for 4-upright bati-rack 535 x 600 mm

	Set of 4 casters
046499	For bati-rack Loading capacity on the 4 casters: 340 kg

	Shelves
	Black RAL 9005
	Screw fixing (projecting) on 2 x 19" uprights
	Height 2U
646501	Max. load: 15 kg Shelf depth 200 mm
646502	Shelf depth 360 mm
	Screw fixing on 4 x 19" uprights
	Height 1U
646506	Shelf depth 625 mm. Max. load: 50 kg
646509	Telescopic shelf depth 625 mm. Max. load: 30 kg



	19" management panels
	Fitted with cable guide rings
646520	1U
646521	2U

1: Height without levelling feet (+27 to 42 mm with feet)

Legrand cabling system LCS³ enclosures
19" accessories


046522


046523

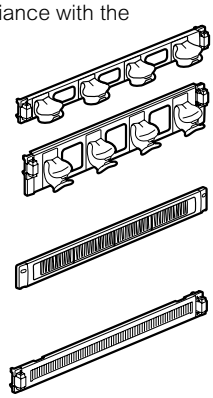

046529


046532

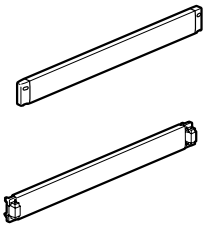

046491


036381

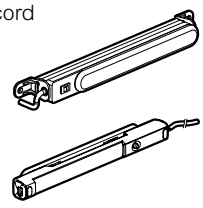
Cat.Nos	19" cable feedthrough panels
	For organising and running patch cords. Black RAL 9005
	Metal, 2 axes, Quick-Fix
	Horizontal feedthrough passage. With cable rings plastic cable guide with controlled radius for optimum cord protection (compliance with the bending radius)
	Quick installation without screws
046522	1 U
046523	2 U
	Plastic with brush, snap on
046528	1 U
046529	2 U
	Metal with brush, Soluclip
	Quick installation without screws
046530	1 U
046531	2 U



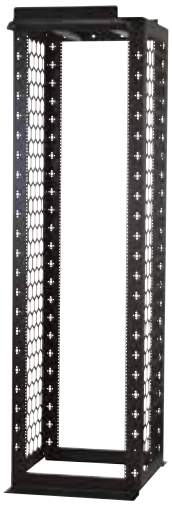
Cat.Nos	19" blanking plates
	Black RAL 9005
	Plastic, direct clipping
046532	1 U
046533	2 U
	Metal, Quick-Fix
	Quick installation without screws
046538	1 U
046539	2 U
046540	3 U



Cat.Nos	LED Lighting
	Prewired with 2 m length power cord Magnets fastening
046491	With switch 60° swivel
036381	With presence sensor 120° swivel



Legrand cabling system LCS³ enclosures
cabling openrack and accessories


446150


446152


446154


446157


446155


446158

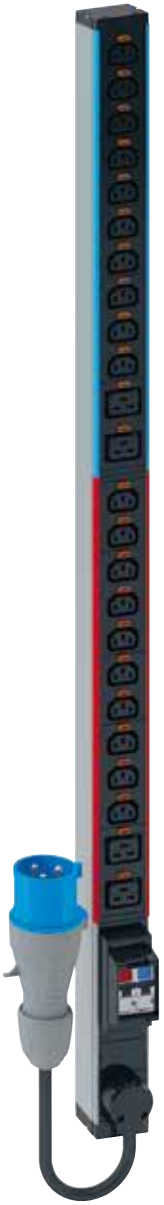

446156


446159

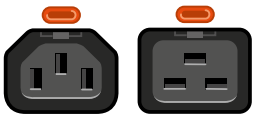
Cat.Nos	Cabling openrack and accessories
446150	Punched hole channel rack, 2130 mm x 609 mm (7 ft x 24"), black, square hole 9 mm (3/8")
446152	Cable duct with door
446154	Hexagonal cable feedthroughs (set of 6)
446155	Bend limiting clips (set of 12)
446156	Cable management spools (set of 4)
446157	Cable management rings
446158	Cable duct mounting brackets (top of rack Cablofil)
446160	Overhead cable tray, 5 U, 19"
446159	Horizontal cable management system
046570	19" closed panel for cord management with pivoting cover - 1U - black - depth 172 mm
046571	19" closed panel for cord management with pivoting cover - 2U - black - depth 172 mm
046423	Set of 50 special screws for racks + 25 earthing claws

Innovation at the heart of PDUs to prevent accidental disconnection

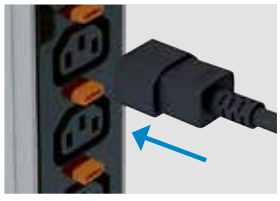
A major addition to the range and exclusive to Legrand, C13 and C19 outlets have a power supply cord locking system which prevents accidental disconnection and gaurantees absolute safety!



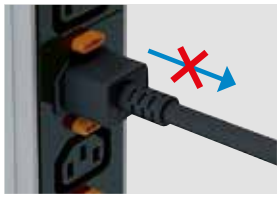
An innovative technical solution: very easy to identify thanks to the orange buttons next to each socket.



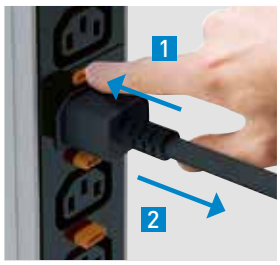
A universal system: takes all cords for standard C13 and C19 outlets.



CONNECTION



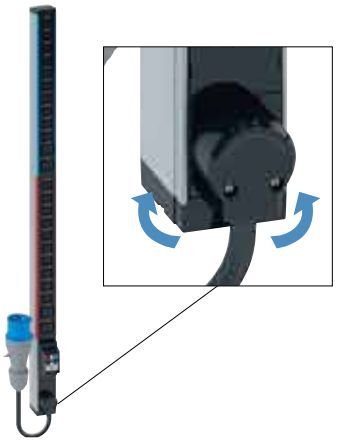
AUTO LOCKING



UNLOCKING

Legrand cabling system LCS³ energy distribution - single-phase Zero-U Basic PDUs

646853



646861

To provide ∿ electric power for IT equipment in 19" enclosures
Single phase Zero-U PDUs for vertical mounting in the cabinet
230 V - 50/60 Hz power supply
PDUs with 2 circuits protected by 16 A uni + neutral MCB (except Cat.Nos 646900/01/02 with 1 circuit) in a support with projecting edges to avoid accidental breakdown. Each circuit is identified by color coding. The total number of outlets is distributed equally between the 2 circuits.
2P+E outlets: C13 and C19 standard outlets,Schuko standards outlets equipped with safety shutters, Schuko standards outlets inclined at 55° 330° rotating cable input for a perfect orientation of the cable and no interference in the cabinet
C13 and C19 standard outlets are equipped with cord locking system to avoid any accidental disconnection. Universal solution compatible with all the cords (C14 plugs for C13 and C20 plugs for C19)
Delivered with 2 sets of metallic mounting brackets: button brackets (for quick fixing and variable pitch) and standard brackets (for screw fixing)
Black modules (outlets and functions)
Aluminium profile

Cat.Nos	PDU Basic
	Schuko standard
646852	24 outlets Connection on terminal block up to 6 mm²
646853	24 outlets 3 m power supply cord with IEC 60309 32 A 2P+E plug
646900	12 outlets With surge protection 3 m power supply cord with 16 A Schuko 2P+E plug
646901	14 outlets With power indicator 3 m power supply cord with 16 A Schuko 2P+E plug
CORD LOCKING SYSTEM	**IEC 60320 standard**
646856	24 C13 outlets with cord locking system Connection on terminal block up to 6 mm²
646857	24 C13 outlets with cord locking system 3 m power supply cord with IEC 60309 32 A 2P+E plug
646902	24 C13 outlets + 12 C19 outlets with cord locking system. With 1 power indicator module per phase. 3 m power supply cord with IEC 60309 32 A 3P+N+E plug
646860	20 C13 outlets + 4 C19 outlets with cord locking system. Connection on terminal block up to 6 mm²
646861	20 C13 outlets + 4 C19 outlets with cord locking system. 3 m power supply cord with IEC 60309 32 A 2P+E plug

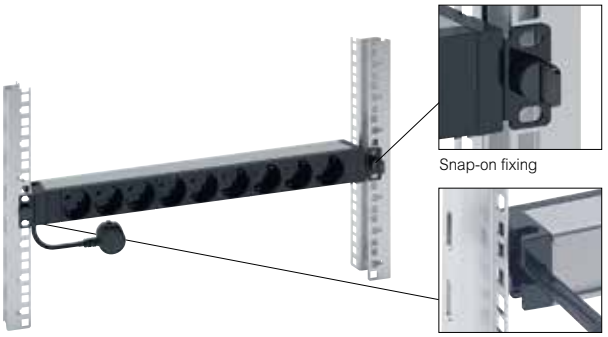
Legrand cabling system LCS³ energy distribution - three-phase Zero-U Basic PDU

646870

To provide ∿ electric power for IT equipment in 19" enclosures
Three phases Zero-U PDU for vertical mounting in the cabinet
400 V - 50/60 Hz power supply
Each circuit is protected by 16 A single pole MCB in a support with projecting edges to avoid accidental breakdown. 1 circuit per phase, each with 6 IEC 60320 C13 outlets and 2 IEC 60320 C19 outlets
330° rotating cable input for a perfect orientation of the cable and no interference in the cabinet
C13 and C19 standard outlets are equipped with cord locking system to avoid any accidental disconnection. Universal solution compatible with all the cords (C14 plugs for C13 and C20 plugs for C19)
Delivered with 2 sets of metallic mounting brackets: button brackets (for quick fixing and variable pitch) and standard brackets (for screw fixing)
Black modules (outlets and functions)
Aluminium profile

Cat.Nos	PDU Basic
	IEC 60320 standard
646870	18 C13 outlets + 6 C19 outlets with cord locking system. 3 m power supply cord with IEC 60309 16 A 3P+N+E plug

Legrand cabling system LCS³ energy distribution - horizontal (1U/2U) Basic PDUs



646812

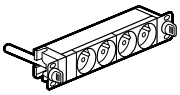
Snap-on fixing

End piece with cable carrier

To provide ∿ electric power for IT equipment in enclosure. 230 V - 50/60 Hz power supply. 1U aluminium profile. End cap with metallic brackets and cable holder shape. Quick fixing (no screws) on 19" fixing centers. Can also be installed vertically by reverting the brackets (no screws)
2P+E outlets:
- C13 and C19 standard outlets are equipped with cord locking system to avoid any accidental disconnection. Universal solution compatible with all the cords (C14 plugs for C13 and C20 plugs for C19).
- French, German and British standard outlets are equipped with safety shutters
- French and German standard outlets are inclined at 55°
Black modules (outlets and functions)

Cat.Nos	19" - PDU Basic
	Schuko standard
	3 m power supply cord with 16 A 2P+E Schuko plug
646806	6 outlets
646812	9 outlets
	IEC 60320 standard
	Connection on terminal block (except Cat.Nos 646815)
646814	10 C13 outlets with cord locking system
646815	12 C13 outlets with cord locking system
	3 m power supply cord with IEC 60309 16 A 2P+E plug
646809	6 C13 outlets + 2 C19 outlets with cord locking system
646807	6 C19 outlets with cord locking system

	10" - PDU Basic
	1 m power supply cord with French/German 2P+E plug
	4 x 2P+E outlets
646801	Schuko standard



Legrand cabling system LCS³ energy
distribution - horizontal (1U/2U) Basic PDUs (continued)

646824

To provide ∿ electric power for IT equipment in enclosure. 230 V - 50/60 Hz power supply. 1U aluminium profile. End cap with metallic brackets and cable holder shape. Quick fixing (no screws) on 19" fixing centers. Can also be installed vertically by reverting the brackets (no screws)
2P+E outlets:
- C13 and C19 standard outlets are equipped with cord locking system to avoid any accidental disconnection. Universal solution compatible with all the cords (C14 plugs for C13 and C20 plugs for C19).
- Schuko standard outlets are equipped with safety shutters
- Schuko standard outlets are inclined at 55°
Black modules (outlets and functions)

Cat.Nos	19" - PDU Basic with power indicator or luminous switch
	LED indicator: signals whether the PDU is supplied with power or not LED indicator switch: powers on/off the PDU
	Schuko standard
	3 m power supply cord with 16 A 2P+E Schuko plug
646821	9 outlets and 1 power indicator
646823	8 outlets and 1 luminous switch

Legrand cabling system LCS³ energy
distribution - 1U Basic Power Distribution Units (PDU)

646836

To provide ∿ electric power for IT equipment in enclosures. 230 V - 50/60 Hz power supply. 1U aluminium profile. End cap with metallic brackets and cable holder shape. Quick fixing (no screws) on 19" fixing centers. Can also be installed vertically by reverting the brackets (no screws)
2P+E outlets:
- C13 and C19 standard outlets are equipped with cord locking system to avoid any accidental disconnection. Universal solution compatible with all the cords (C14 plugs for C13 and C20 plugs for C19).
- French, German and British standard outlets are equipped with safety shutters
- French and German standard outlets are inclined at 55°
Black modules (outlets and functions)

Cat.Nos	19" Basic PDU with protection devices
	MCB and RCBO support with projecting edges to avoid accidental breakdown 3 m power supply cord with 16 A 2P+E Schuko plug
	Schuko standard
646831	6 outlets and a 16 A single pole Micro Circuit Breaker
646832	9 outlets nd a 16 A single pole Micro Circuit Breaker, 2 U height

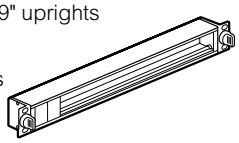
	19" Basic PDU with surge protection
	Protect against mains overvoltages while keeping outlets energised With light indicators: - one LED (white) gives information whether the PDU is supplied with power or not - one LED (green) indicates when surge protection module is efficient or must be replaced Equipped with hotswappable surge protection module Cat.No 646897: even when the module is being replaced, the PDU and its outlets are still powered on 3 m power supply cord with 16 A 2P+E Schuko plug
646836	6 outlets - Schuko standard - with switch
646903	7 outlets - Schuko standard

Legrand cabling system LCS³ energy distribution - PDUs to be equipped, accessories and DIN rails

646890

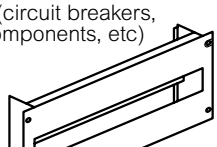
046546 + 046547

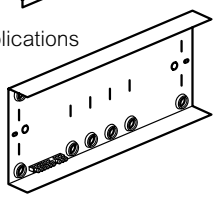
Cat.Nos	PDUs to be equipped
	Quick fixing (no screws) on 19" uprights Aluminium profile
646899	19'' PDU Capacity: 16 Mosaic modules
646898	10'' PDU Capacity: 8 Mosaic modules



	PDU accessories
	Locking caps To block the use of an outlet. A key is necessary to remove the cap and free the access Light grey RAL 7035
646890	Set of 6 locking caps for French, Italian and German standard outlet + 1 key
646892	Set of 6 locking caps for British standard outlet + 1 key
646896	Set of 6 locking caps for Swiss standard T13 or T23 outlet + 1 key
646894	Set of 6 locking caps for C13 outlet + 1 key
646895	Set of 6 locking caps for C19 outlet + 1 key
	Surge protection module
646897	To replace used module on PDU With light indicators: - 1 LED (white) to indicate voltage presence - 1 LED (green/red) to indicate the status of the surge protection module Hotswappable surge protection module: even when the module is being replaced, the PDU and its outlets are still powered on

	Multi-application DIN rail
	For mounting modular devices (circuit breakers, Legrand multimedia network components, etc) Capacity: 24 modules Height 4 U Screw fixing on 19" uprights
046546	DIN profile rail with front panel Supplied with blanking plates 24 modules Black RAL 9005
046547	Rear cover To be used for high current applications (greater than 50 V) To be associated with DIN profile rail Cat.No 046546 Ensures IP XXB Supplied with terminal block (8 + 1 connections)





METERED AND SWITCHED PDUS

Intelligent PDUs for even more reliable data centers!

Meeting your needs for energy while incorporating intelligent functions, including real-time power metering and environmental monitoring? It's possible with Legrand's connected PDUs (iPDUs)!

ACCURATE +/-1% POWER INPUT MEASUREMENT

Accurate energy consumption measurements with multiple configurations possible.

BEST-IN-CLASS CONTROLLER FEATURES

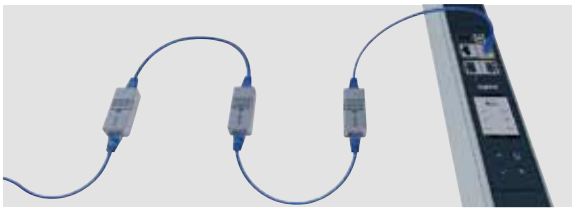
- Dual 10/100 Ethernet ports
- USB Type-A and Type-B ports
- CLI management port
- Color Coded Alert Screen

REMOTE OUTLET MANAGEMENT GROUPING

- For checking that devices are only plugged in on available circuits.
- Switched models allow users to deactivate unavailable sockets remotely for load shedding or protection.

COMPATIBLE WITH RARITAN SMARTSENSORS

All Raritan SmartSensors work out of the box with Legrand intelligent PDUs, are easily integrated in the cabinet, can be connected in a daisy chain and can be replaced without having to rewire the cabinet.



All Legrand intelligent PDUs can be monitored and managed remotely through a secured Web User Interface !

Contact your local sales rep for more information!

Applications distances according to category of cabling

Application \ Frequency[1]	LCS³ Cat.5e 100MHz	LCS³ Cat.6 250MHz	LCS³ Cat.6A 500Mhz	LCS³ Cat.8 2000MHz
1000Base-T	100m	100m	100m	100m
2.5Gbase-T	Possible[2]	Possible[2]	100m	100m
5Gbase-T	Possible[2]	Possible[2]	100m	100m
10Gbase-T	N/A[4]	Possible[3]	100m	100m
25Gbase-T	N/A[4]	N/A[4]	Possible[5]	30m
40Gbase-T	N/A[4]	N/A[4]	Possible[5]	30m

1: Maximum frequency defined in the standards
2: Follow ISO/IEC TR 11801-9904 or TIA TSB 5021 to evaluate possibility on installed links. Distance will depend on many factors.
3: Follow ISO/IEC TR 24750 or TIA TSB 155-A to evaluate possibility on installed links. Distance will depend on many factors.
4: Not Available.
5: Follow ISO/IEC TR 11801-9905 to evaluate possibility on installed links. Distance will depend on many factors.

Compliance of LCS³ systems with standards and certifications

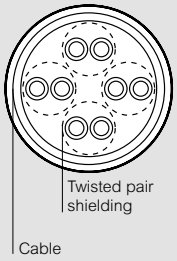
LCS³ systems and components (de-embedded) conform to the following standards:
- ANSI/TIA 568
- EN 50173-1
- ISO/IEC 11801 Edition 3 (2017)

The LCS³ system supports 10 G applications Base-T up to 100 m in a transmission channel
Conforming to standards: ISO/IEC 11 801, EN 50173, ANSI/TIA 568
LCS³ systems are certified by the 3P independent laboratory, a reference body on the subject

Names for LAN cables (according to ISO 11801-2)

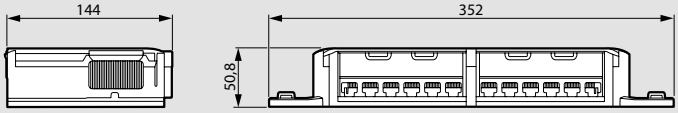
They correspond to: "type of cable shielding"/"type of twisted pair shielding" followed by TP (for twisted pairs)

Type of cable old name	Type of cable new name	Cable shielding	Shielding of twisted pairs
SSTP	S/FTP	S: screen made of copper braid	F: screen formed from an alu/ polyester ribbon
SFTP	SF/UTP	SF: combination of ribbon + braid	U: no screen
STP	U/FTP	U: no screen	F: screen formed from an alu/ polyester ribbon
FTP	F/FTP	F: screen formed from an alu/ polyester ribbon	F: screen formed from an alu/ polyester ribbon
FTP	F/UTP	F: screen formed from an alu/ polyester ribbon	U: no screen
UTP	U/UTP	U: no screen	U: no screen

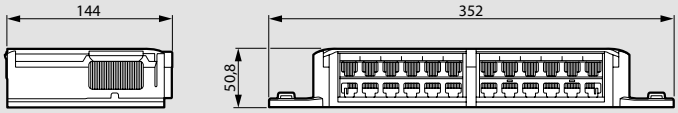


Dimensions (in mm)

Cat.No 033796



Cat.No 033797



The Innoval training centre offers LCS³ certification, see **our website**

25-year guarantee: Legrand is committed to delivering a durable LCS³ system, see **our website**

Performance when installed with a zone distribution box (consolidation point)

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

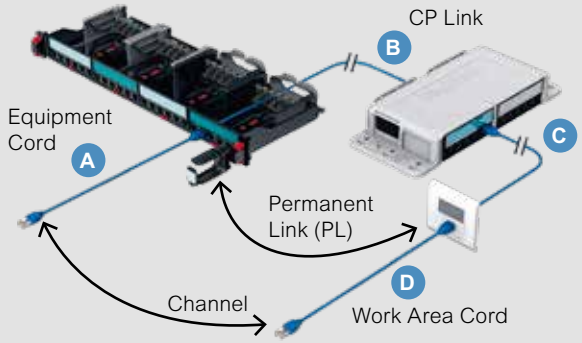
Performances for use of zone distribution boxes in 20°C environment

The distances below correspond to the most typical cases using preterminated solutions

All other standard-compliant configurations are possible, including configurations with use of cables to be connected on site

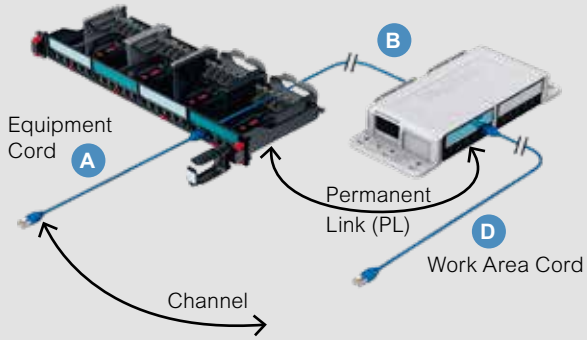
Refer to technical sheets for more information

a) Use of the area cabling cord in a channel with a Consolidation Point:



CP Cord C	CP Link B	Equipment Cord A	Work Area Cord D	Total Channel
8 m	74 m	5 m	5 m	92 m
15 m	63 m	5 m	5 m	88 m
20 m	56 m	5 m	5 m	86 m

b) Use of the area cabling cord in a channel with a MUTOA (Multi-User Telecommunications Outlet Assembly):



Work Area Cord D	Permanent Link B	Equipment Cord A	Total Channel
8 m	82 m	5 m	90 m
15 m	72 m	5 m	87 m
20 m	64 m	5 m	84 m

Legrand cabling system LCS³ - copper (continued)

PoE certification

Using PoE technology, devices such as Wi-Fi access points, cameras, etc. can be supplied with power by the Ethernet data cable. The cable combines data and power to supply all the PoE peripherals. The LCS³ connectors are PoE++ Third Party certified.

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

Table of PoE types according to cabling requirements and power availability

Name (Common name)	Type 1 (PoE)	Type 2 (PoE+)	Type 3 (PoE++)	Type 4 (PoE++)
IEEE Standard	802.3af (2003)	802.3at (2009)	802.3bt (2018)	802.3bt (2018)
Minimum Category Required	Category 3	Category 5e	Category 5e	Category 5e
Number of Pairs for Power	2	2	2 or 4	4
Maximum Current per Pair	350 mA	600 mA	600 mA	960 mA
Guaranteed maximum Power at PSE Output	15.4 W	30.0 W	60.0 W	90.0 W
Guaranteed maximum Power at PE Input	13 W	25.5 W	51.0 W	71.3 W
Diagram with maximum current per wire (mA)	175 175 175 175	300 300 300 300	300 300 300 300 300 300 300 300	480 480 480 480 480 480 480 480

Pair with outgoing current

Pair with returning current

Pair without current

There are subdivisions of PoE called Classes. Below is a table of these Classes with correspondence to the PoE Types and the power available. It's important to note that the difference of power between the PD and the PSE does not represent an average efficiency, but only a worst case with maximum distance and highest resistance cabling.

Class	1	2	3	4	5	6	7	8
Type	Type 1			Type 2	Type 3(1)		Type 4(2)	
PSE maximum output average power (W)	4	7	15.4	30	45	60	75	90
PD Input Average Power (W)	3.8	6.5	13.0	25.5	40.0	51.0	62.0	71.3
PD Peak operating Power (P)	5.0	8.4	14.4	28.3	42.0	53.5	65.1	74.9

1: Type 3 can also support Classes 1 to 4
2: Only single signature PD shown

High-performance maintenance

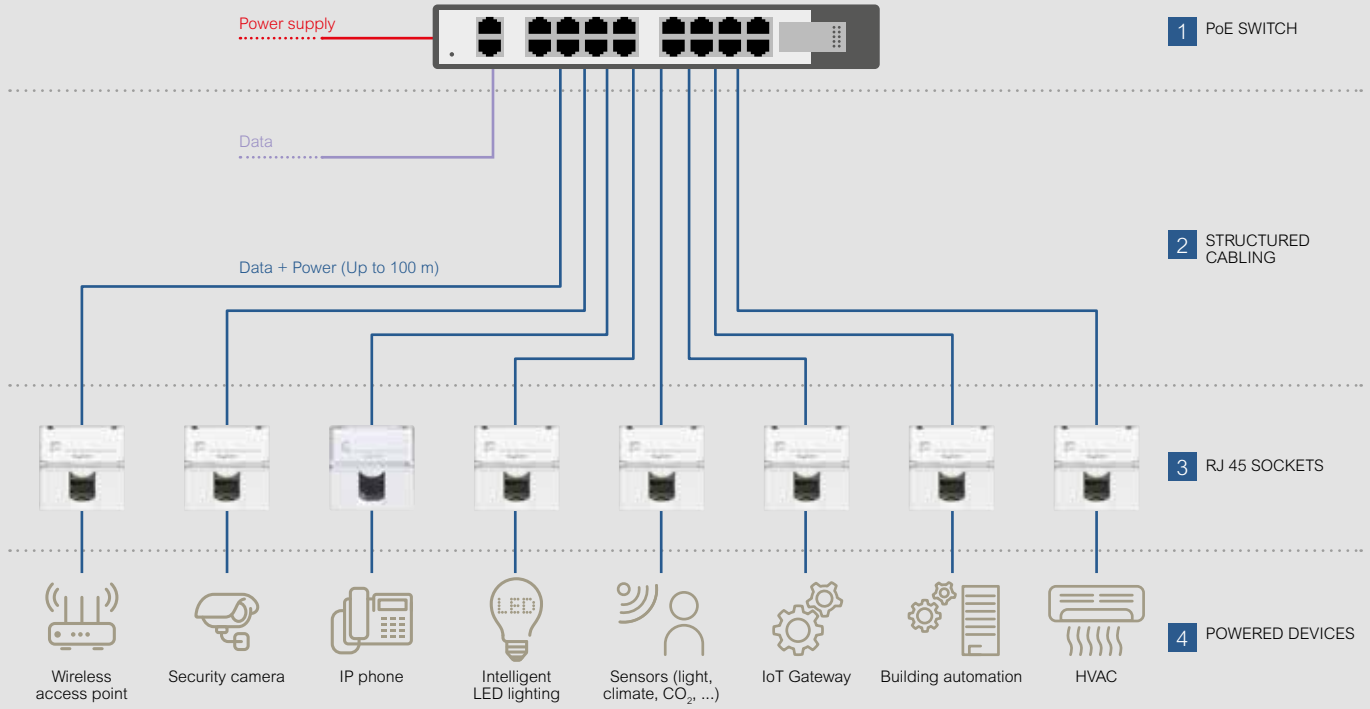
WARRANTY 25 YEARS legrand

Being committed to delivering a durable LCS³ system, Legrand gives a 25-year guarantee on its performance and applications, PoE included

Legrand cabling system LCS³ - copper (continued)

PoE architecture

Building systems are moving to a single IP Network



PoE switch

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

Structured cabling

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

RJ 45 sockets

Universal RJ 45 socket to connect devices.

Powered devices

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

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

Legrand cabling system LCS³ - copper (continued)

Construction Products Regulation (CPR)

The CPR is a European law published in 2011, with a classification ratified in 2016, to impose minimum fire performance to products installed permanently in buildings. It covers, among other items, the communications cables fixed in the building, but not the removable items such as patch cords and user cords. Vendors are required to comply since July 1st, 2017 and the fire rating must be identified on the cable packaging along with the CE mark. The associated declaration of performance (DoP) must be made available to customers.

The EU regulation enforcing the standard by law is applicable to all European Economic Area (E.E.A.) member states: Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

It also applies in the countries voluntarily participating to be part of the single market: Iceland, Liechtenstein, Norway and Switzerland. In addition, four other countries are E.U. candidates and in the process of incorporating EU legislation into national law: Montenegro, Macedonia, Serbia and Albania. Finally, Turkey is an associate member, voluntarily following EU regulations.

The classification consists of 7 Euroclasses which define the fire reaction performance. Below is a table summarizing the classification:

Testing and level of control		A_{CA}	$B1_{CA}$	$B2_{CA}$	C_{CA}	D_{CA}	E_{CA}	F_{CA}
Euro classification	Gross heat of combustion	yes	-	-	-	-	-	-
	Flame propagation	-	yes	yes	yes	yes	yes	no
	Heat release	-	yes	yes	yes	yes	no	no
Additional criteria	Smoke production, flaming droplets, smoke acidity	-	yes	yes	yes	yes	no	no
Control of compliance	Type Testing by independent lab	yes	yes	yes	yes	yes	yes	no
	Production sampling by certification body	yes	yes	yes	yes	no	no	no

Explanation of the Euroclasses

Euroclass	Reaction to fire	Comments
A_{CA}	Non combustible	It is near-impossible to produce non-combustible communication cable.
$B1_{CA}$	Various level of flame propagation and heat release	Dca is the lowest cable type with all aspect tested and certified by an independent laboratory. Higher classes offer improved resistance to flame propagation and heat release but their additional criteria could be identical.
$B2_{CA}$		
C_{CA}		
D_{CA}		
E_{CA}	Minimum flame propagation testing	Heat release is not tested. Additional requirements are not tested, so the spread of fire is controlled, but the evacuation of people is limited due to toxic fumes. This is the first level of cable to require independent testing.
F_{CA}	No testing	Offers absolutely no guarantees. Should be avoided.

Definitions of the additional criteria

Smoke production	Performance
s1	Very low smoke production
s1a	Very low smoke production and high transmittance
s1b	Very low smoke production and medium transmittance
s2	Average smoke production
s3	No performance guaranteed

Particles / Droplets	Performance
d0	No droplets / flaming particles
d1	Low droplets / flaming particles
d2	No performance guaranteed

Smoke acidity	Performance
a1	Very low smoke acidity
a2	Low smoke acidity
a3	No performance guaranteed

These additional criteria are added after the letter of the Euroclass in order s, d, a. and they allow for more than 200 combinations.
For obvious reasons, most will not exist, and only the most useful ones will be used.

It is important to understand that the lowest rating in each type means that the product actually does not meet the requirements.

Legrand cabling system LCS³ - copper (continued)

Euroclass table

Cat.Nos	Description	Euroclass (A_{ca}; $B1_{ca}$; $B2_{ca}$; C_{ca}; D_{ca}; E_{ca}; F_{ca})	Additional criteria (smoke production, flaming droplets, acidity)		
032750	C5e U/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
032751	C5e U/UTP 4P PVC CABLE	E_{ca}	-	-	-
032752	C5e F/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
032753	C5e F/UTP 4P PVC CABLE	E_{ca}	-	-	-
032754	C6 U/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
032755	C6 U/UTP 4P PVC CABLE	E_{ca}	-	-	-
032756	C6 F/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
032757	C6 SF/UTP 4P LSZH CABLE	D_{ca}	s1	d1	a1
032758	C6 F/UTP 4P PVC CABLE	E_{ca}	-	-	-
032759	C6 SF/UTP 4P PVC CABLE	E_{ca}	-	-	-
032776	C6 F/UTP 2x4P LSZH CABLE	D_{ca}	s2	d2	a1
032777	C7 S/FTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
032778	C6A F/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
032779	C7 S/FTP 2X4P LSZH CABLE	D_{ca}	s2	d2	a1
032787	C6A U/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
032798	C6A F/FTP 2X4P LSZH CABLE	D_{ca}	s2	d2	a1
032799	CÂBLE C6A F/FTP 4P LSZH	D_{ca}	s2	d2	a1
032828	C6A U/UTP 4P LSZH CABLE	C_{ca}	s1a	d1	a1
032838	C6A U/UTP 4P LSZH CABLE	$B2_{ca}$	s1a	d1	a1
032849	C7 S/FTP 4P LSZH CABLE	C_{ca}	s1a	d1	a1
032850	C5e F/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
032853	C5e U/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
032856	C6 F/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
032857	C6 F/UTP 4P PVC CABLE	E_{ca}	-	-	-
032861	C6 U/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
032878	C6A F/UTP 2X4P LSZH CABLE	D_{ca}	s2	d2	a2
032879	C6 U/UTP 4P LSZH CABLE	$B2_{ca}$	s1a	d1	a1
032882	C7 S/FTP 4P LSZH CABLE	$B2_{ca}$	s1a	d1	a1
032883	C6A F/FTP 4P LSZH CABLE	C_{ca}	s1a	d1	a1
032884	C6A U/FTP 4P LSZH CABLE	C_{ca}	s1a	d1	a1
032886	C6 U/UTP 4P LSZH CABLE	C_{ca}	s1a	d1	a1
032888	C6 U/UTP 100P LSZH CABLE	E_{ca}	-	-	-
0 338 90	C7 S/FTP 4P LSZH CABLE	E_{ca}	-	-	-
032891	C3 U/UTP 50P LSZH CABLE	E_{ca}	-	-	-
033788	C8 S/FTP 4P LSZH CABLE	D_{ca}	s2	d2	a1

Duplex applications, functioning on Duplex LC

Duplex	OM3	OM4	OM5	OS1a	OS2
10Gbps	300m(1)	400m(1)	400m(1)	2km(1)	10km(1)
25Gbps	70m(1)	100m(1)	100m(1)	2km(1)	10km(1)
40Gbps	240m(2)	350m(2)	440m(2)	2km(1)	10km(1)
50Gbps	70m(1)	100m(1)	100m(1)	2km(1)	10km(1)
100Gbps	70m(2)	100m(2)	150m(2)	2km(1)	10km(1)
200Gbps	N/A(3)	N/A(3)	N/A(3)	2km(1)	10km(1)
400Gbps	N/A(3)	N/A(3)	N/A(3)	2km(1)	10km(1)

1: Standard
2: Multi-Source Agreement
3: Not applicable

Parallel optics applications, functioning on 12-core MPO/MTP

Parallel	OM3	OM4	OM5	OS1a	OS2
10Gbps	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
25Gbps	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
40Gbps	100m(1)	150m(1)	150m(1)	N/A(2)	N/A(2)
50Gbps	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
100Gbps	70m(1)	100m(1)	100m(1)	500m(1)	500m(1)
200Gbps	70m(1)	100m(1)	100m(1)	500m(1)	500m(1)
400Gbps	100m(1)	100m(1)	150m(1)	500m(1)	500m(1)

1: Standard
2: Not applicable

16, 20 and 32 core applications not shown as they are not compatible with single 12-core MPO links
Note that any duplex application can also function on MPO/MTP parallel optics infrastructure

Optical performance

MTP® connectors

	Multimode Ultra Performance*	Singlemode Ultra Performance*
IL/Master	0.1 dB typical (all fibres) 0.35 dB maximum (single fibre) (2.3)	0.1 dB typical (all fibres) 0.35 dB maximum (single fibre) (1.4)
IL Max/Random*	0.35 dB (single fibre)	0.35 dB (single fibre)
Optical return loss (5)	> 20 dB	> 60 dB (8° anglepolished)

1: As tested in accordance with ANSI/TIA-455-171 Method D3 / IEC 61300-3-4
2: As tested in accordance with ANSI/TIA-455-171 Method D1 / IEC 61300-3-4
3: As tested on 50µm fibres at a wavelength of 850 nm in accordance with IEC 61280-4-1
4: Complies with IEC 61755-3-31/GRADE B
5: As tested in accordance with IEC 61300-3-6 and ANSI/TIA-455-107A

* Performance is guaranteed only with other components of the same Legrand range (Core, Ultra and Quantum). Mixing ranges or use of components of other brand may lead to a different performance of the system. The uncertainty value for field measurement with LSPM testing using a reference cord defined in ISO/IEC 14763-3 applies to field testing with proposed Legrand testing cords. Refer to the Fiber Optic Testing Guide for Legrand Solutions.

LC, SC, LC APC, SC APC connectors

Optical performance	Singlemode Ultra Performance	Multimode Ultra Performance
IL Max/Master (*)	0.15 dB	0.15 dB
IL Max/Random (**)(***)	0.25 dB	0.2 dB
Typ. IL/Master (*)	0.12 dB	0.08 dB
Typ. IL/Random (**)(***)	0.12 dB	0.10 dB
Return loss (UPC/APC)	> 55/65 dB	> 25 dB

* IEC 61300-3-4
** IEC 61300-3-34
*** Performance is guaranteed only with other components of the same Legrand range (Core, Ultra and Quantum). Mixing ranges or use of components of other brand may lead to a different performance of the system. The uncertainty value for field measurement with LSPM testing using a reference cord defined in ISO/IEC 14763-3 applies to field testing with proposed Legrand testing cords. Refer to the Fiber Optic Testing Guide for Legrand Solutions.
Storage and operating temperature: -10°C to +60°CSolutions.

Production quality control

- For MTP:
Optical performance: 100% factory tested
3D endface geometry (interferometry): 100% factory products controlled

- For LC, SC, LC APC, SC APC:
Optical performance: 100% factory tested
3D endface Geometry (interferometry): sampling quality control

Technical characteristics

Multimode cable

OM5 fiber is designed for wavelength multiplexing

Type of cable	OM3	OM4	OM5
Type of fiber[1]	A1a.2	A1a.3	A1a.4
Maximum attenuation at 850 nm, dB/km	3	3	3
Effective bandwidth at 850 nm, MHz x km	2000	4700	4700
Effective bandwidth at 953 nm, MHz x km	N/A	N/A	2470

1: According to IEC 60793-2-10

Single-mode cable

Type of cable	OS1a	OS2
Environment	Indoor	Indoor/ Outdoor
Type of fiber(1)	B1,3 or B6	
Maximum attenuation at 1310, 1383 and 1550 nm	1.0	0.4

1: According to IEC 60793-2-50

Euroclass table

Cat.Nos	Euroclass (A_{ca}; $B1_{ca}$; $B2_{ca}$; C_{ca}; D_{ca}; E_{ca}; F_{ca})	Additional criteria (smoke production, flaming droplets, acidity)		
		s1, s1a, s1b, s2, s3	d0, d1, d2	a1, a2, a3
032502	D_{ca}	s2	d2	a1
032503	D_{ca}	s2	d2	a1
032510	D_{ca}	s2	d2	a1
032511	D_{ca}	s2	d2	a1
032512	D_{ca}	s2	d2	a1
032513	Not applicable	-	-	-
032514	D_{ca}	s2	d2	a1
032515	Not applicable	-	-	-
032518	C_{ca}	s1a	d1	a1
032519	C_{ca}	s1a	d1	a1
032523	Not applicable	-	-	-
032524	Not applicable	-	-	-
032525	Not applicable	-	-	-
032526	C_{ca}	s1a	d1	a1
032537	D_{ca}	s2	d2	a1
032538	D_{ca}	s2	d2	a1
032539	D_{ca}	s2	d2	a1
032540	Not applicable	-	-	-
032541	Not applicable	-	-	-
032542	Not applicable	-	-	-
032543	D_{ca}	s2	d2	a1
032544	D_{ca}	s2	d2	a1
032545	D_{ca}	s2	d2	a1
032546	Not applicable	-	-	-
032547	Not applicable	-	-	-
032548	Not applicable	-	-	-
032549	C_{ca}	s1a	d1	a1
032550	D_{ca}	s2	d2	a1
032551	D_{ca}	s2	d2	a1
032552	D_{ca}	s2	d2	a1
032553	D_{ca}	s2	d2	a1
032665	D_{ca}	s2	d2	a1
032666	D_{ca}	s2	d2	a1
032667	D_{ca}	s2	d2	a1
032668	D_{ca}	s2	d2	a1

	Euroclass	Classification criteria	Additional criteria	AV CP system
Non-combustible (for example mineral-insulated)	A_{ca}	EN ISO 1716 Gross combustion heat	-	"1+" including: - initial type test and continuous monitoring - audit and sampling test by a third-party certification body Manufacturer's factory production controls
Cables with low fire risk (different levels)	$B1_{ca}$	EN 50399 Heat release Flame spread EN 60332-1-2 Flame propagation	Smoke production (s1a, s1b, s2, s3) EN50399/ EN61034-2 Acidity (a1, a2, a3) EN 50267-2-3 Flaming droplets (d0, d1, d2) EN 50399	
	$B2_{ca}$			
	C_{ca}			
	D_{ca}			"3+" including: - initial type test by a third-party laboratory Manufacturer's factory production controls
Standard cables	E_{ca}	EN 60332-1-2 Flame propagation	-	
No determined performance	F_{ca}	EN 60332-1-2 Flame propagation	-	"4": initial type test and manufacturer's factory production controls

General characteristics

Metal baying cabinets
RAL 7016 textured polyester coating providing excellent resistance to corrosion and scratching
Screen-printed reversible single or double glass door
Protection index against ingress of solid objects and liquids: IP 20
Protection index against mechanical impacts: IK 08
Perforations in 19" uprights: 9.5 x 9.5 mm
Permissible load: 400 kg

Compliance with standards

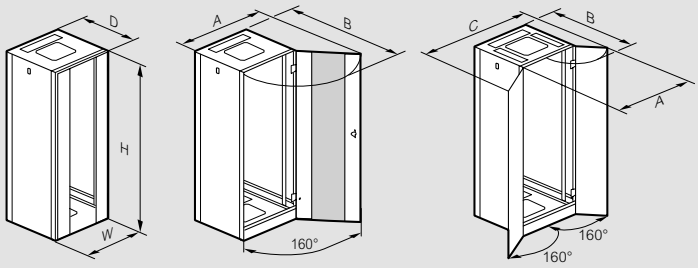
Linkeo cabinets comply with the following standards:

IEC 60529 EN 60529	(NF C 20-010) Degrees of protection provided by enclosures (IP code)
IEC 62262 EN 62262	(NF EN 50102, NF C 20-015) Degrees of protection provided by enclosures for 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, racks, panels and associated equipment (ANSI/EIA/310-E-2005)
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

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

EN 50173-1	Information technology - Generic cabling systems
EN 50174-1 & 2 C 90-480-1 & 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 - Protection for safety - Protection against electric shock

Dimensions (mm)



Cabinets with single front door

Cabinet dimensions	Overall dimensions				
	H(1)	W	D	A	B
24U 600 x 600	1226	610	630	1138	1210
24U 800 x 800		810	830	1525	1610
33U 600 x 600	1626	610	630	1138	1210
33U 800 x 800		810	830	1525	1610
42U 600 x 600	2026	610	630	1138	1210
42U 600 x 800		610	830	1138	1410
42U 600 x 1000		610	1030	1138	1610
42U 800 x 600		810	630	1525	1410
42U 800 x 800		810	830	1525	1610
42U 800 x 1000		810	1030	1525	1810
47U 800 x 800	2248	810	830	1525	1610
47U 800 x 1000		810	1030	1525	1810

1: Height without levelling feet (+19 to 39 mm with feet)

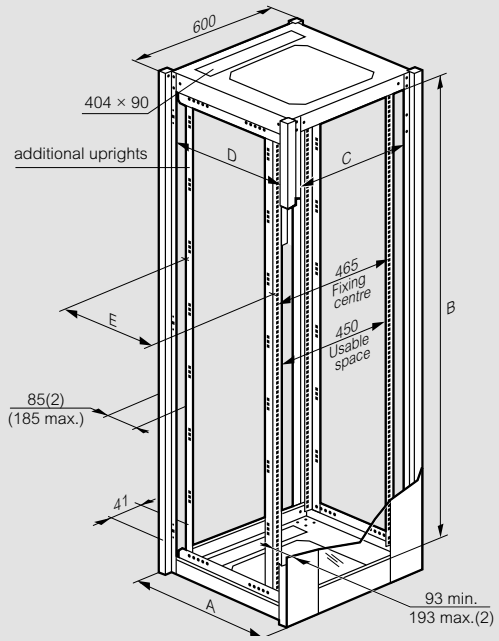
Cabinets with double front door

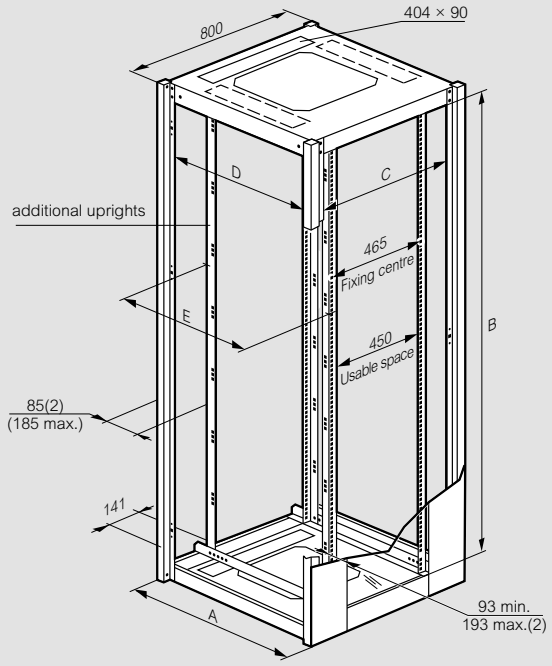
Cabinet dimensions	H(1)	W	D	A	B	C
42U 800 x 800	2026	810	630	1164	1011	1528
42U 800 x 800			830		1211	
42U 800 x 1000			1030		1411	

1: Height without levelling feet (+19 to 39 mm with feet)

Linkeo 19" freestanding cabinets (continued)

Dimensions (mm)

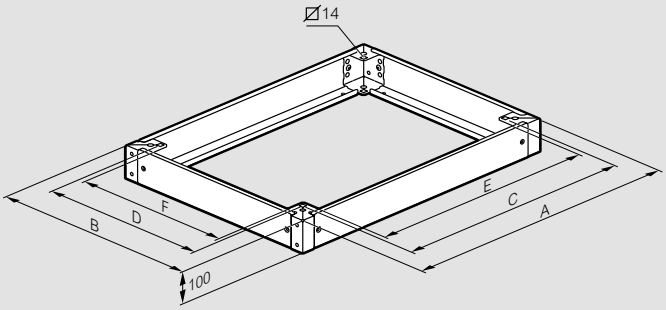




Cabinet dimensions	A(1)	Usable space			E	Glass window Door
		B	C	D		
24U 600 x 600	630	1081	490	490	425	1073 × 360
24U 800 x 800	830		690	690	625	1073 × 450
33U 600 x 600	630	1481	490	490	425	1473 × 360
33U 800 x 800	830		690	690	625	1473 × 450
42U 600 x 600	630	1881	490	490	425	1873 × 360
42U 600 x 800	830			690	625	
42U 600 x 1000	1030			890	825	
42U 800 x 600	630		690	490	425	1873 × 450
42U 800 x 800	830			690	625	
42U 800 x 1000	1030			890	825	
47U 800 x 800	830	2103	690	690	625	2095 × 450
47U 800 x 1000	1030		690	890	825	2095 × 450

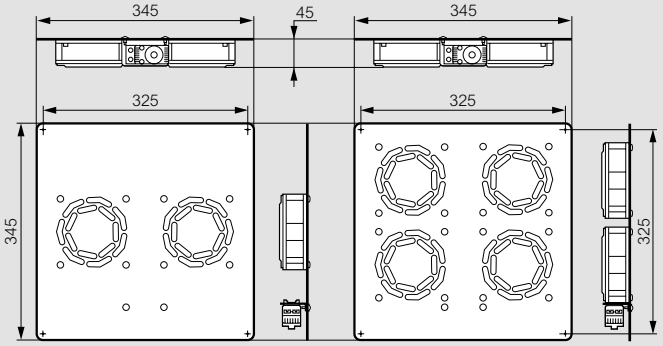
1: Overall dimensions
2: Can be adjusted in 25 mm steps

Plinths for Linkeo cabinets (mm)



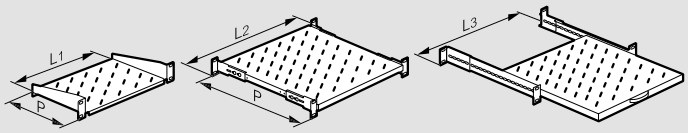
Cabinet dim. Width x Depth	Overall		Fixing		Usable space	
	A	B	C	D	E	F
600 x 600	599	599	478	478	449	449
600 × 800	599	799	478	678	449	649
600 × 1000	799	599	678	478	649	449
800 × 600	799	799	678	678	649	649
800 × 800	599	999	478	878	449	849
800 × 1000	799	999	678	878	649	849

Linkeo fan kits (mm)



Linkeo 19" freestanding cabinets (continued)

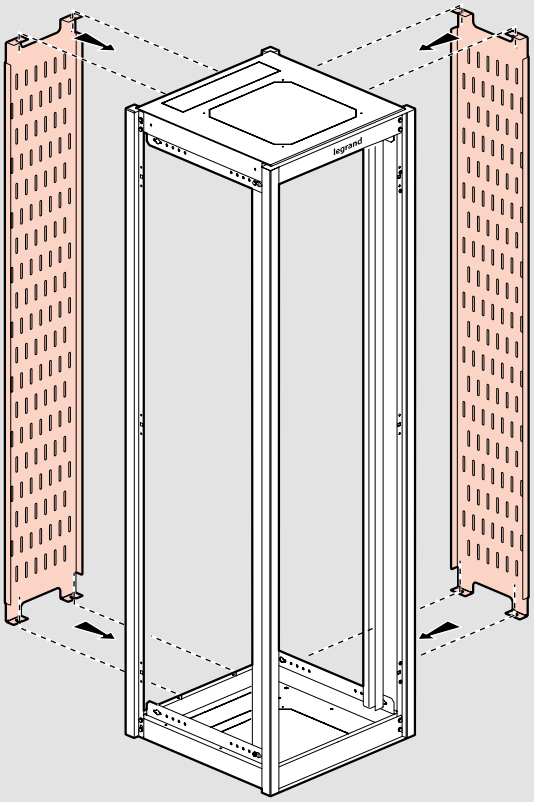
Linkeo shelves (mm)



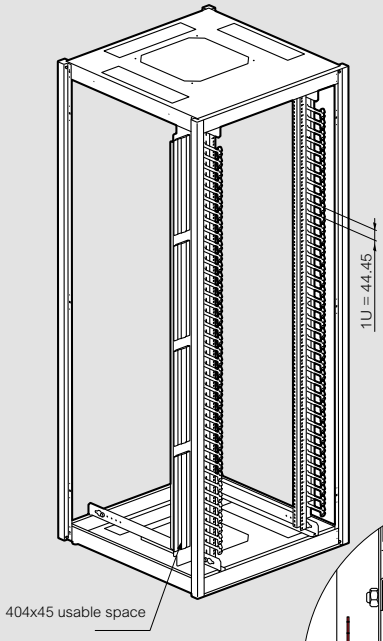
Cat.Nos	D	Usable width		
		W1	W2	W3
646501	200	435		
646502	360	435		
646505	425		440	
646506	625		440	
646507	825		440	
646508	425			410
646509	625			410
646510	825			410

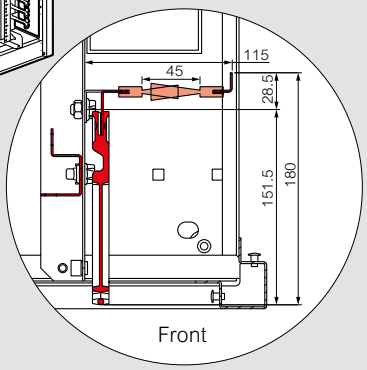
Linkeo vertical cable trays

33U tray 646420): 1486 x 300 x 25 mm
42U tray 646421): 1886 x 300 x 25 mm
47U tray 646422): 2105 x 300 x 25 mm



Vertical cable managers 646426/27



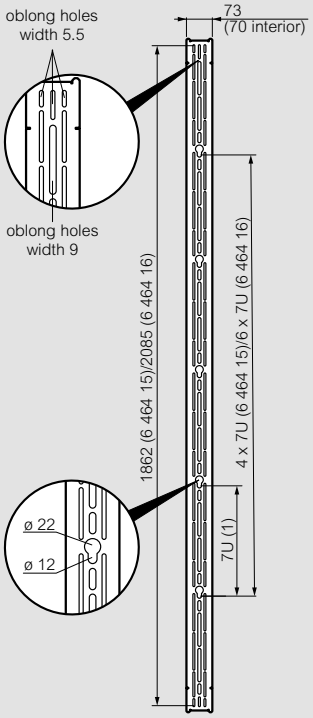


Top view

PDU supports 646415/16 (mm)

Top view

Front view



Side view

Linkeo 19" wall-mounting cabinets

General characteristics

Metal wall-mounting cabinets
RAL 7016 textured polyester coating providing excellent resistance to corrosion and scratching
Safety glass door
Protection index against ingress of solid objects and liquids: IP 20
Protection index against mechanical impacts: IK 08
Perforations in 19" uprights: 9.5 x 9.5 mm
Permissible load: 3 kg/U

Compliance with standards

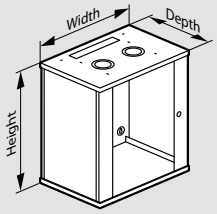
Linkeo cabinets comply with the following standards:

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 for electrical equipment against external mechanical impacts (code IK)
IEC 60950-1 EN 60950-1 C 77-210-1	Safety of information technology equipment
EIA-310-E	Cabinets, racks, panels and associated equipment (ANSI/EIA/-310-D-2005)
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

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

EN 50173-1	Information technology - Generic cabling systems
EN 50174-1 & 2 C 90-480-1 & 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 - Protection for safety - Protection against electric shock

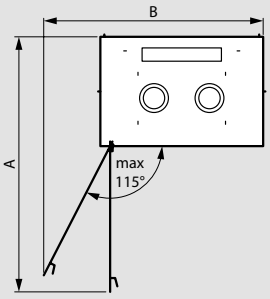
Overall dimensions (mm)



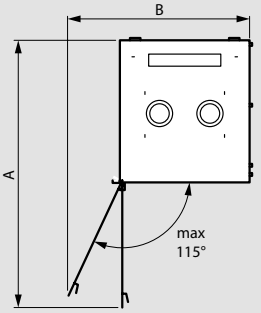
		Cat.Nos	Capacity	Height	Width	Depth
19" fixed cabinet	**fixed side panels**	**646200**	6U	359	605	454
		646201	9U	492	605	454
		646202	12U	625	605	454
		646203	15U	759	605	454
		646204	18U	892	605	454
		646205	21U	1025	605	454
		646210	6U	359	605	604
		646211	9U	492	605	604
		646212	12U	625	605	604
		646213	15U	759	605	604
		646214	18U	892	605	604
		646215	21U	1025	605	604
	removable side panels	**646250**	6U	359	608	458
		646251	9U	492	608	458
		646252	12U	625	608	458
		646253	15U	759	608	458
		646254	18U	892	608	458
		646255	21U	1025	608	458
		646260	6U	359	608	608
		646261	9U	492	608	608
		646262	12U	625	608	608
		646263	15U	759	608	608
		646264	18U	892	608	608
		646265	21U	1025	608	608
19" pivoting cabinets		**646221**	9U	492	642	615
		646222	12U	625	642	615
		646223	15U	759	642	615
		646224	18U	892	642	615
		646225	21U	1025	642	615
10" fixed cabinets		**646230**	6U	359	373	303

Door opening (mm)

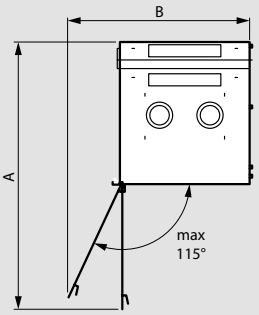
19" fixed cabinets with fixed side panels Cat.Nos 646200/.../15



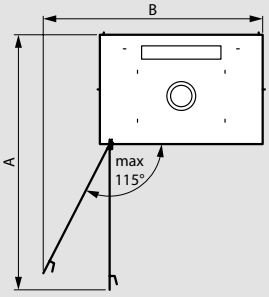
19" fixed cabinets with removable side panels
Cat.Nos 646250/.../65



19" pivoting cabinets
Cat.Nos 646221/.../25

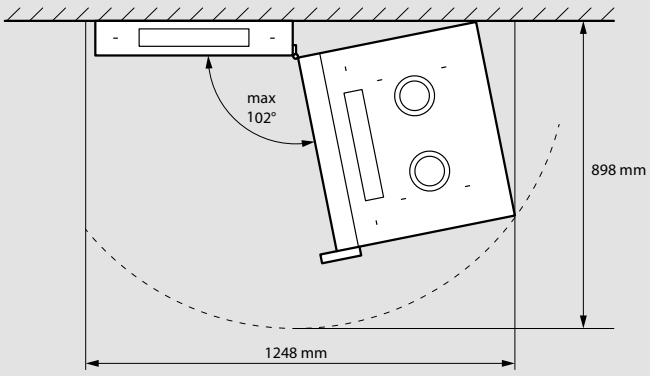


10" cabinet
Cat.No 646230

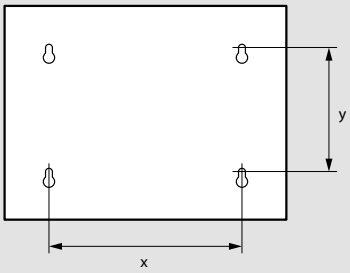


		Cat.Nos	Capacity	A	B
19" fixed cabinet	**fixed side panels**	**646200**	6U	981	795
		646201	9U	981	795
		646202	12U	981	795
		646203	15U	981	795
		646204	18U	981	795
		66205	21U	981	795
		646210	6U	1131	795
		646211	9U	1131	795
		646212	12U	1131	795
		646213	15U	1131	795
		646214	18U	1131	795
		646215	21U	1131	795
	removable side panels	**646250**	6U	983	797
		646251	9U	983	797
		646252	12U	983	797
		646253	15U	983	797
		646254	18U	983	797
		646255	21U	983	797
		646260	6U	1133	797
		646261	9U	1133	797
		646262	12U	1133	797
		646263	15U	1133	797
		646264	18U	1133	797
		646265	21U	1133	797
19" pivoting cabinets		**646221**	9U	1141	809
		646222	12U	1141	809
		646223	15U	1141	809
		646224	18U	1141	809
		646225	21U	1141	809
10" fixed cabinet		**646230**	6U	602	460

Pivoting base opening

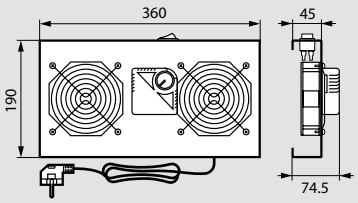


Fixing (mm)



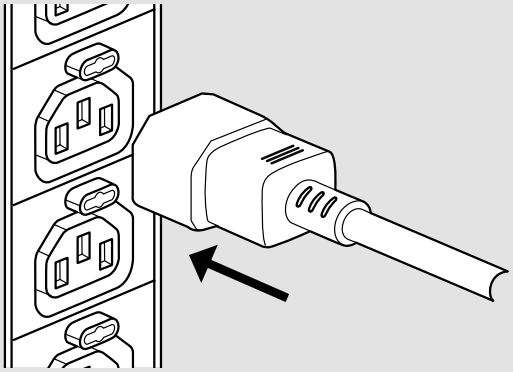
		Cat.Nos	Capacity	X	Y
19" fixed cabinet	fixed side panels	646200	6U	400	152
		646201	9U	400	286
		646202	12U	400	419
		646203	15U	400	552
		646204	18U	400	685
		646205	21U	400	819
	removable side panels	646210	6U	400	152
		646211	9U	400	286
		646212	12U	400	419
		646213	15U	400	552
		646214	18U	400	685
		646215	21U	400	819
		646250	6U	400	152
		646251	9U	400	286
		646252	12U	400	419
		646253	15U	400	552
		646254	18U	400	685
		646255	21U	400	819
		646260	6U	400	152
		646261	9U	400	286
		646262	12U	400	419
		646263	15U	400	552
		646264	18U	400	685
		646265	21U	400	819
19" pivoting cabinets		646221	9U	400	390
		646222	12U	400	523
		646223	15U	400	657
		646224	18U	400	790
		646225	21U	400	923
10" fixed cabinet		646230	6U	171	197

Fan kit (mm)



Cord locking system on C13 and C19 sockets

1



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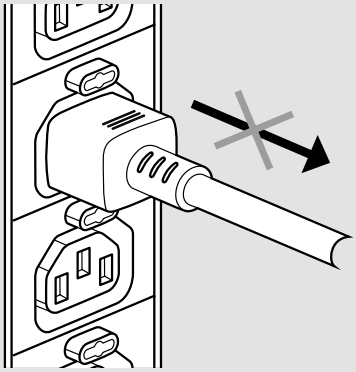

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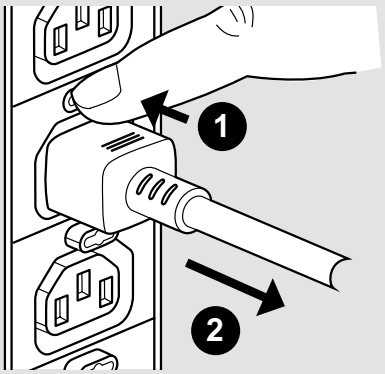
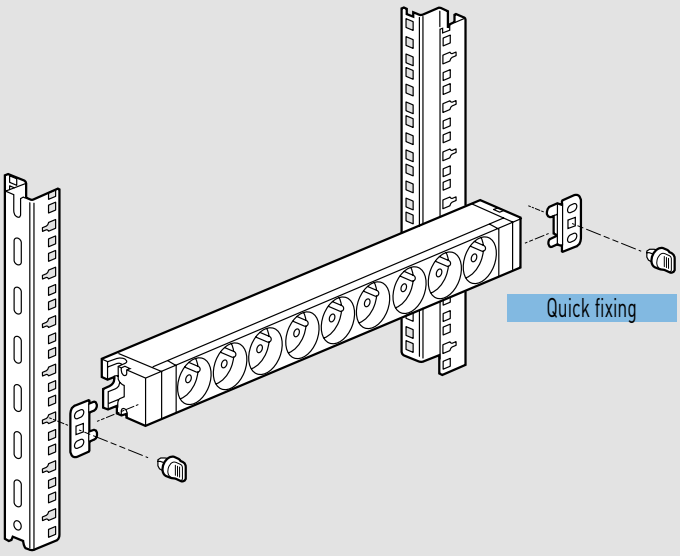
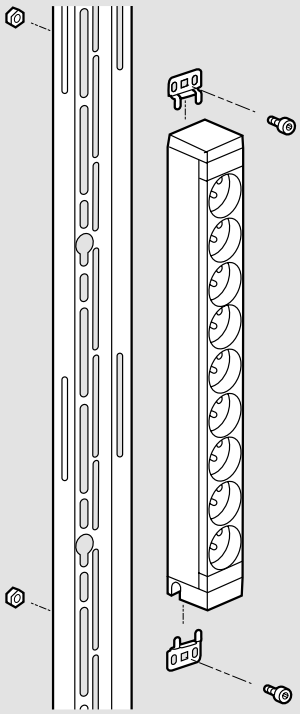


Horizontal mounting in Legrand 19" cabinets

Can be mounted in all Legrand 19" cabinets except for 19" HD racks which require the use of equipment screws Cat.No 046423



Vertical mounting in freestanding cabinets with support



19" 1U PDU configurations

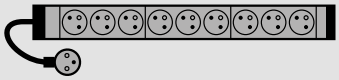
646805

646806

646807

646809

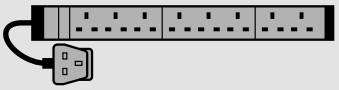
646810



646811

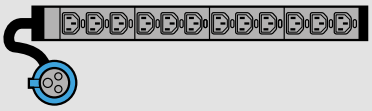
646812

646813



646814

646815

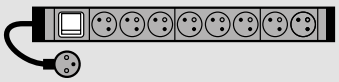


646818/19

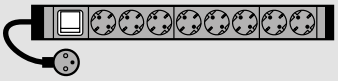
646820

646821

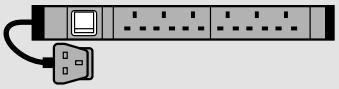
646822



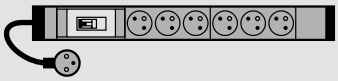
646823



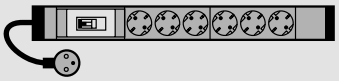
646824



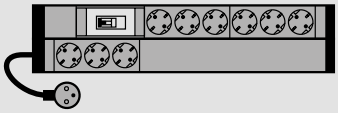
646830



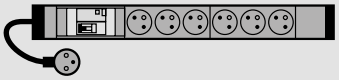
646831



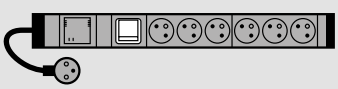
646832



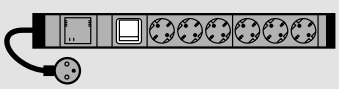
646833



646835

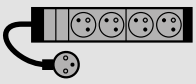


646836

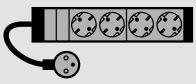


10" 1U PDU configurations

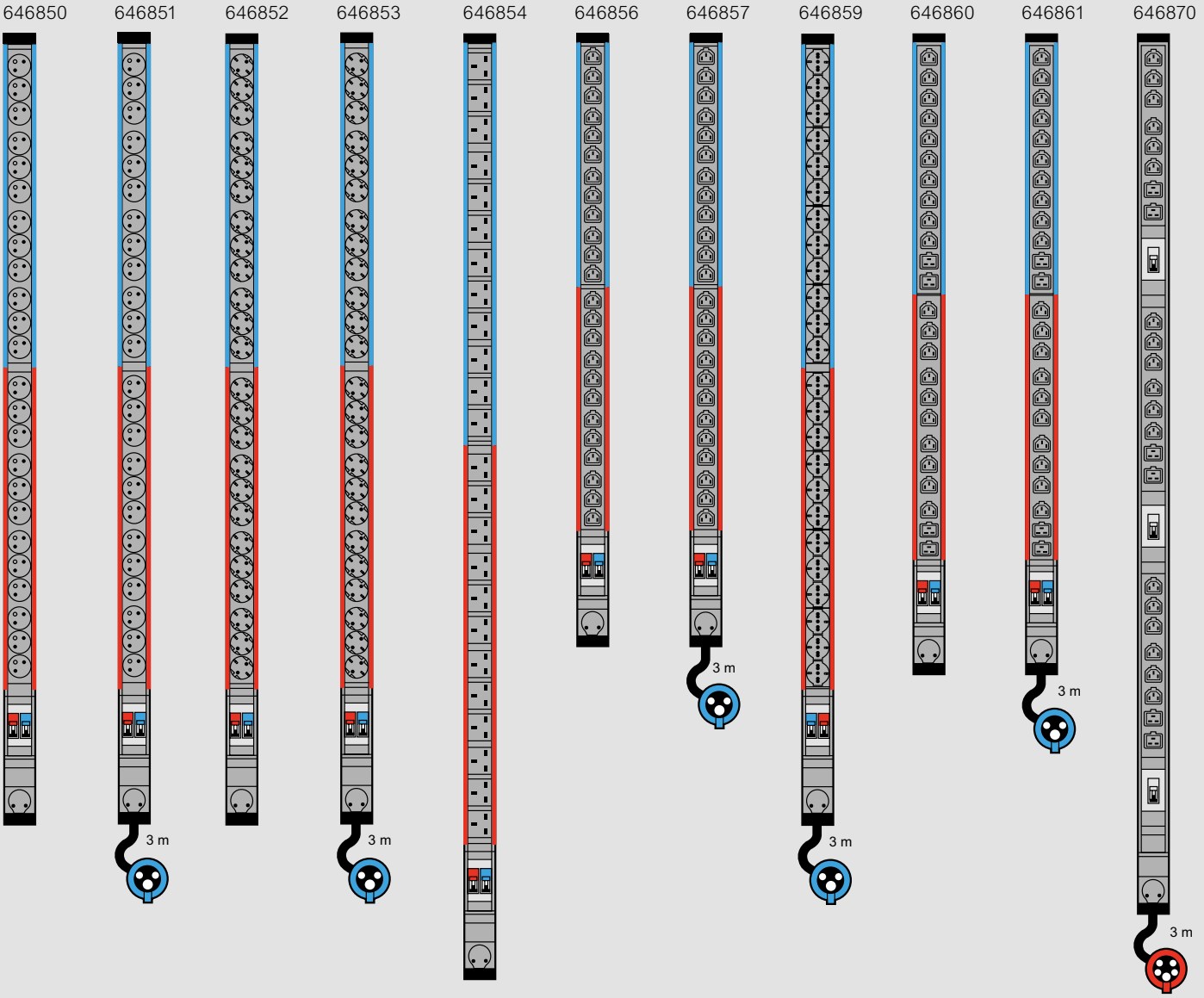
646800



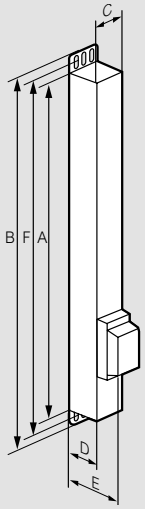
646801



Zero-U PDU configurations



Zero-U PDU dimensions (mm)

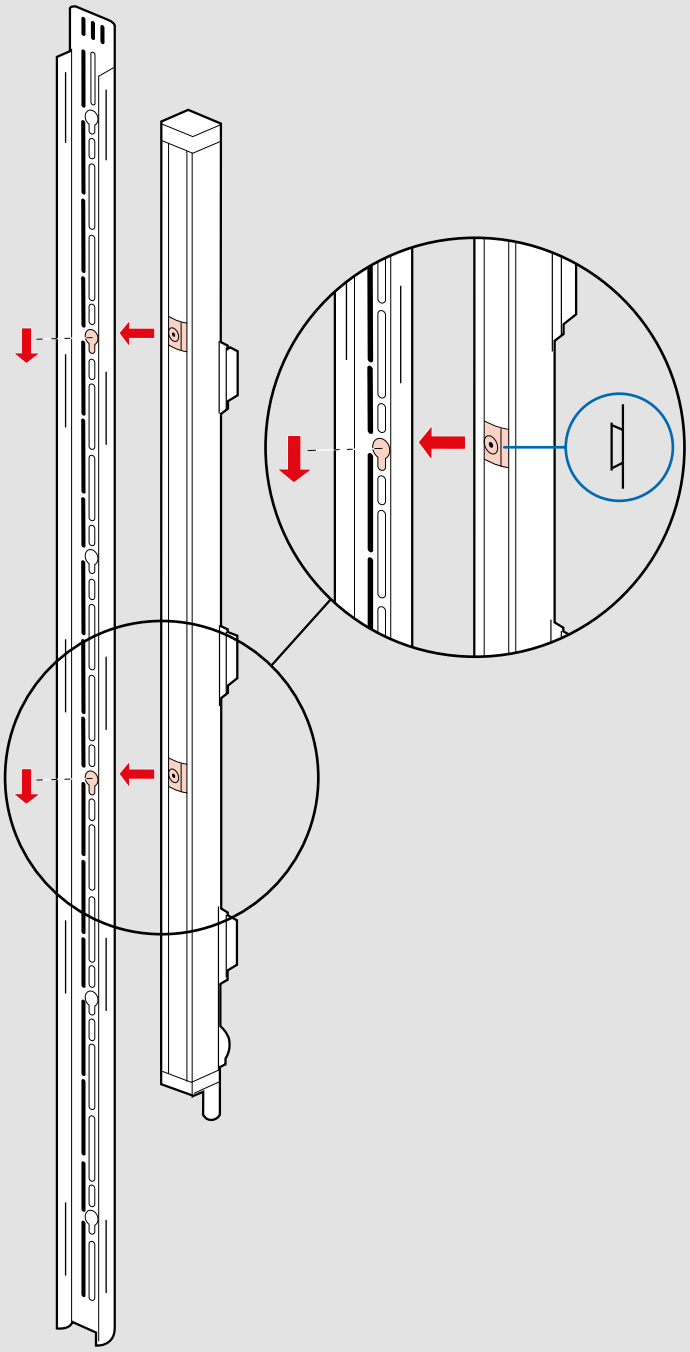


Cat.Nos	Height		Width	Depth		Fixing centres (min.-max.)	
	A	B(1)	C	D	E(2)	F(1)	
646850	1247	1291	52	52.5	87	1259	1279
646851	1247	1291	52	52.5	87	1259	1279
646852	1247	1291	52	52.5	87	1259	1279
646853	1247	1291	52	52.5	87	1259	1279
646854	1463	1507	52	52.5	87	1475	1495
646856	1031	1075	52	52.5	87	1043	1063
646857	1031	1075	52	52.5	87	1043	1063
646859	1319	1363	52	52.5	87	1331	1351
646860	1067	1111	52	52.5	87	1079	1099
646861	1067	1111	52	52.5	87	1079	1099
646870	1340	1384	52	52.5	87	1352	1372

1: With standard lugs for screw mounting
2: Total depth at circuit breaker position

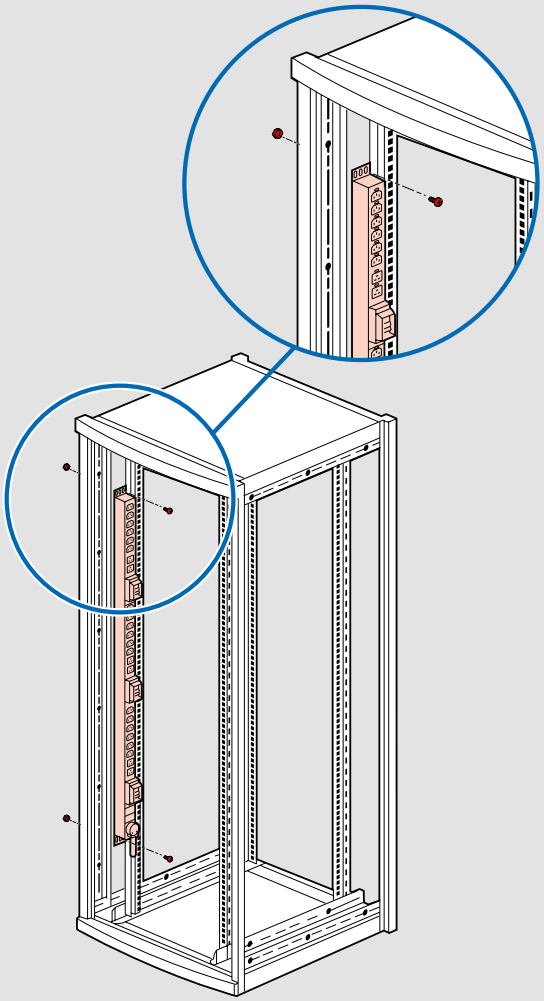
Solution with button brackets

Quick fixing without screws with support



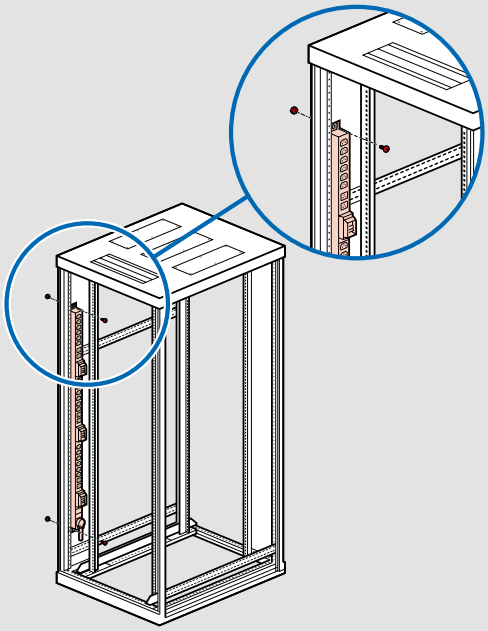
Solution with standard brackets

Screw fixing with support



Solution with LCS³ brackets

Screw fixing with support



Notes

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