LCS 3

3 DIMENSIONS OF EXCELLENCE

PERFORMANCE · SCALABILITY · EFFICIENCY

DATA CENTRE
LOCAL AREA NETWORK

CATALOGUE PAGES INSIDE

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

legrand®

LCS 3
3 DIMENSIONS OF EXCELLENCE
PERFORMANCE SCALABILITY EFFICIENCY

eliot™
PROGRAM BY LEGRAND

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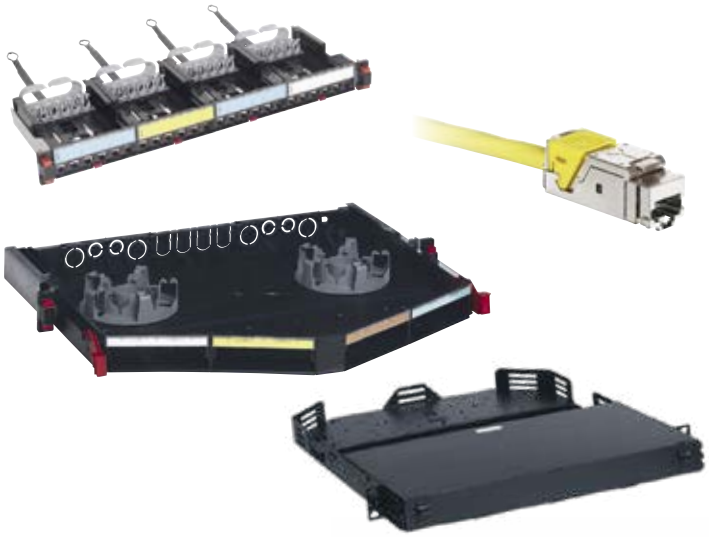

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LCS 3

3 DIMENSIONS OF EXCELLENCE

PERFORMANCE · SCALABILITY · EFFICIENCY

Legrand

A global player

Legrand is the global specialist in electrical and digital building infrastructures. The Group offers a comprehensive range of solutions and services tailored to residential, commercial and industrial markets. The scope of our offer and leading industry position make Legrand a worldwide benchmark.

4 KEY AREAS of expertise

From control and connection interfaces to cable management, energy distribution and data distribution systems, Legrand provides a host of solutions designed to manage lighting, energy, networks and building access.

AN ACTIVE INTERNATIONAL PRESENCE

ESTABLISHED IN OVER **90** COUNTRIES

SALES IN CLOSE TO **180** COUNTRIES

TURNOVER
NEARLY
6.6 BILLION

OVER **38,000** EMPLOYEES

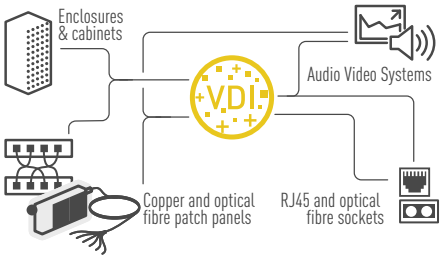
INNOVATION
4.8 % OF SALES INVESTED IN R&D

A WIDE CHOICE OF SOLUTIONS

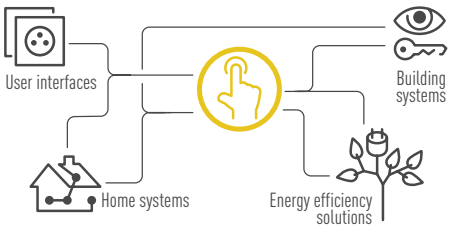
OVER **300,000** CATALOGUE ITEMS

MORE THAN **70** BRANDS

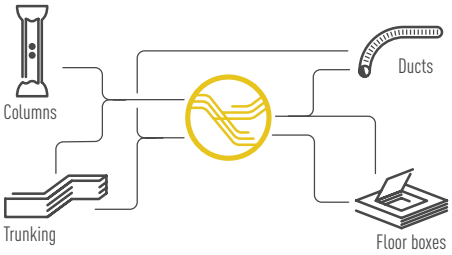
DIGITAL INFRASTRUCTURE



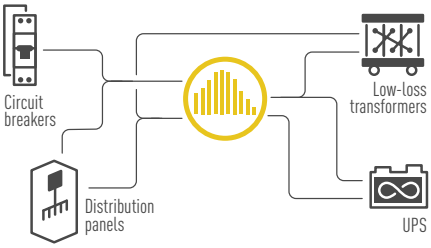
CONTROL AND COMMAND



CABLE MANAGEMENT



ENERGY DISTRIBUTION



LCS 3

3 DIMENSIONS OF EXCELLENCE

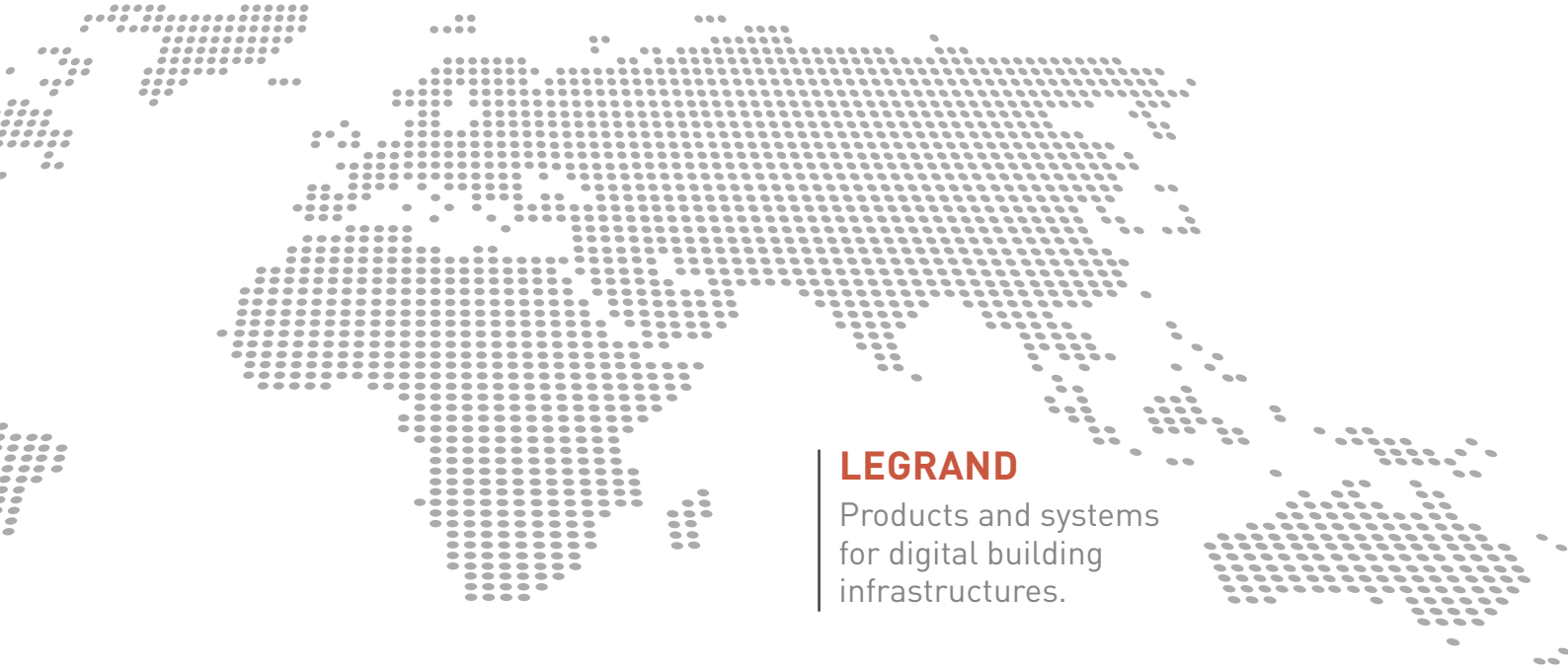
PERFORMANCE SCALABILITY EFFICIENCY

Legrand Group

A leading company for all your IT networks

Legrand cabling systems currently provide high-quality connectivity to more than 200 million devices. The Legrand Group is a world leader in communication networks for data transmission. Its investment in the development and design of structured cabling systems and solutions has enabled it to expand its offer and achieve the highest level of perfomance. These solutions are ideal for today's multimedia networks, technologies and applications.

GLOBAL PLAYERS
DATACOM IT



LEGRAND

Products and systems for digital building infrastructures.

A PORTFOLIO OF SPECIALIST BRANDS

• C2G • Electrorack • Estap • Minkels • Raritan • Server Technology Inc.
• SJ Manufacturing • Starline • Valrack • Cablofil • ETL

LCS 3
3 DIMENSIONS OF EXCELLENCE
PERFORMANCE SCALABILITY EFFICIENCY

Our digital infrastructure expertise

Legrand's complete global solutions for data communication perfectly address the key challenges for digital networks: performance, scalability and efficiency.

1 LOCAL AREA NETWORKS

SOLUTIONS FOR STRUCTURED CABLING

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

2 DATA CENTRE & 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.)
- **Fibre solutions**
  (Preterminated, intelligent patching, high-density fibre optic solutions, etc.)

3 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, etc.)
- **Cords and adaptors**

LCS3
3 DIMENSIONS OF EXCELLENCE
PERFORMANCE SCALABILITY EFFICIENCY

High Performance

Legrand's LCS^3 system offers you

1. 25 Gbps and 40 Gbps Ethernet applications
   COPPER SYSTEM
2. 40 Gbps, 100 Gbps and 400 Gbps Ethernet applications
   FIBRE OPTIC SYSTEM
3. MTP/MPO high density and up to Cat. 8 solutions
   FIBRE OPTIC & COPPER SYSTEMS

FIBRE OPTIC SYSTEM

MTP/MPO solution transmission up to 400 Gbps

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

MPO/MTP fibre optic drawers. Up to 96 LC on 1U. Easy access in order to move, add & change fibres.

Up to 144 LC on 1U. Available in 1U, 2U and 4U.

COPPER SYSTEM

Cat. 8 transmission up to 40 Gbps

Cable & connector compliant with ISO/IEC 11801 standards - third edition.

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

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 standard - third edition
- Tested up to 2500 connection/disconnection cycles
- A perfect connection in just a few seconds

PATENTED DESIGN

PoE+ Third Party certified

CONNECTION & CABLING

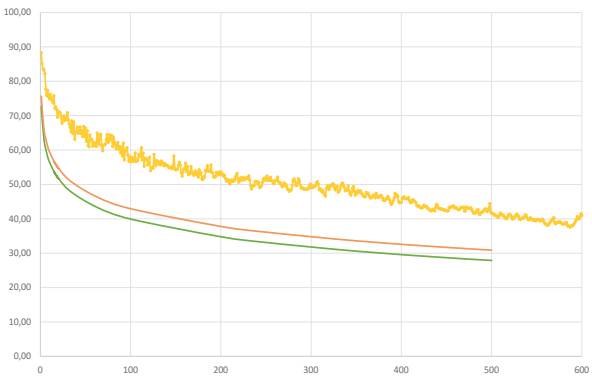
To maximise performance, combine the Legrand Cat. 8 connector together with the Legrand Cat. 8 cable supporting up to 40 Gbps over a single cable.
The Cat. 8 cable is terminated with an improved dedicated RJ45 connector which can support future performance.
The performance is 4 times better than that 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 centres and equipment rooms
- Compliant with ISO/IEC 11801 standard - third edition

Legrand guarantees the following performance on end-to-end links of Cat. 6A / Class E_A :
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.

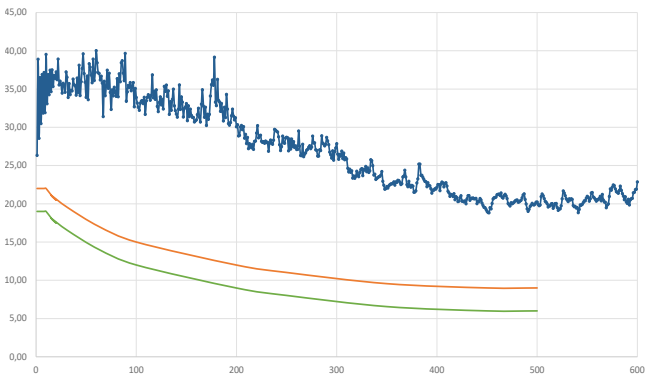
- No marginal results (shown with Asterisk on test results) on Permanent Links
- Valid on standard compliant 2 connectors channels.

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.

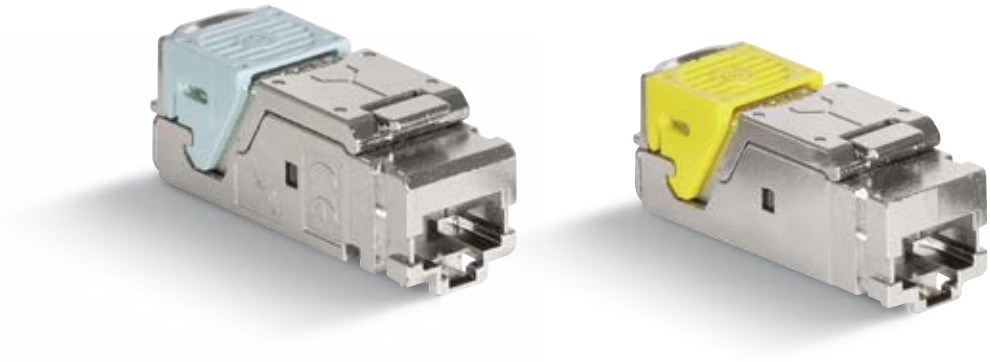
3-Follow ISO/IEC TR 24750 or TIA TSB 155-A to evaluate possibility on installed links. Distance will depend on many factors.

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 Imput 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 (final draft) and EN 50174-2:2018
- Connectors: Compatible remote powering "PoE" up to 100 W. (IEEE 802.3af, IEEE 802.3at, IEEE 802.3bt)
- 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 (final draft) and/or and EN 50174-2:2018

Confident in the design and quality of our solutions, we overperform and guarantee for shielded LCS^3 system 90 metres Permanent Link* at 40°C temperature with up to 100 Watts PoE.

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

QUALITY & PROTECTION

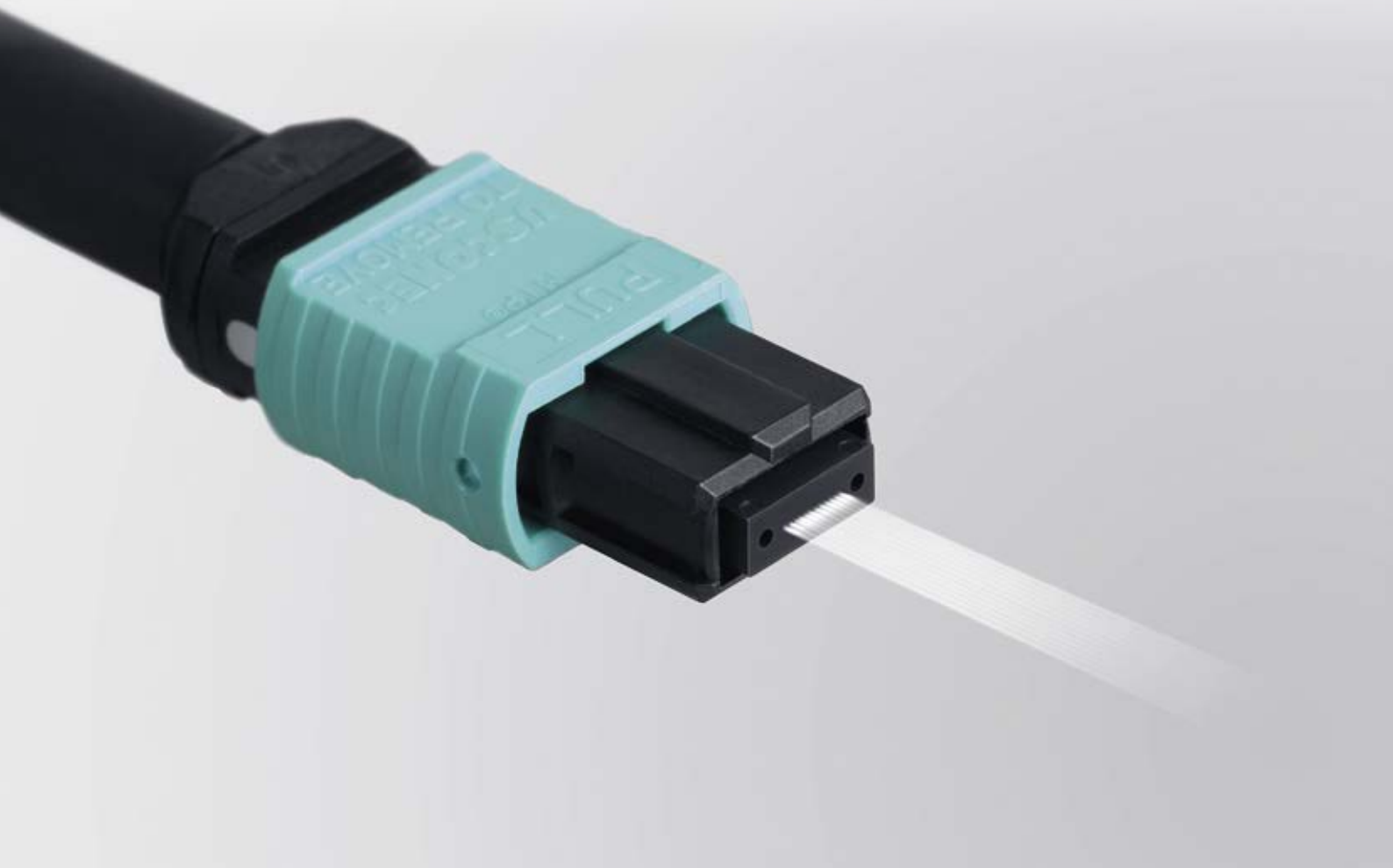
Due to the high power in PoE++, the choice of a high-quality connector is essential. While disconnected, Legrand's high-quality connectors prevent damage to the contacts due to the arc generated.

FIBRE OPTIC SYSTEM

Legrand's MTP system

HIGH-SPEED SOLUTION

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



MTP is a registered trademark of US Conec Ltd

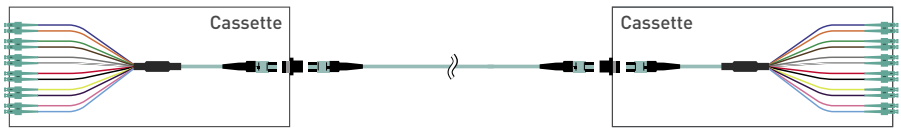
40/100/400 GIGABIT ETHERNET CONNECTIVITY AND CABLE

With the need for parallel optics, the MPO-style connector has been 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 feature:

- a high-speed connection with 12 fibres (2x12 for 24 fibres and with cassettes 8 fibres compatible)
- precise and safe connection
- optimised cable management
- high-density fibres
- 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



HIGH PERFORMANCE

MTP/MPO high performance	Multimode high performance	Singlemode high performance
Insertion loss / Master IEC 61300-3-4	Up to 0.1 dB typical (all fibres) Up to 0.35 dB maximum (single fibre)	Up to 0.1 dB typical (all fibres) Up to 0.35 dB maximum (single fibre)
Optical return loss	>20 dB	> 60 dB (8° angle-polished)

The ultra high density connector in our offer is the MTP

LC® CONNECTOR

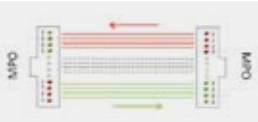
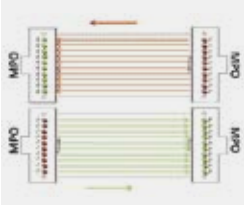
	Multimode high performance	Singlemode high performance
IL Max/Master (Acceptance)	Up to 0.15 dB	Up to 0.15 dB
IL Max/Random	Up to 0.25 dB	Up to 0.30 dB
Ave/Master	0.08 dB	0.12 dB
Ave/Random	0.1 dB	0.12 dB
Return loss	Minimum 35 dB	Up to 55 dB

COMMON DATA CENTRE APPROACHES

Multimode fibre systems have been the most cost effective fibre solution to use in the data centre because the transceivers are much less expensive than singlemode transceivers. Multimode transceivers use a VCSEL which is far less costly to manufacture than the LASER for singlemode. However, the technology also means that they have shorter reach, but since datacentres need generally less than 150m, and with 80% of links less than 100m, these multimode links are perfectly adapted.

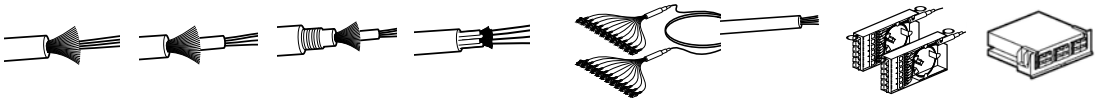
So, although single cable is less expensive, factoring in the total system cost of cable plus transceivers, the multimode solution is more cost efficient in those short links.

EXAMPLE OF THE FIRST APPLICATIONS USING PARALLEL OPTICS

	10G	40G	100G (-SR10)	100G (-SR4)
Signalling	10 Gb	10 Gb x 4	10 Gb x 10	25 Gb x 4
Laser Type	VCSEL	VCSEL Array	VCSEL Array	VCSEL Array
Fibre Type	OM3/OM4	OM3/OM4	OM3/OM4	OM3/OM4
Connector	2 LCs	12-fibre MPO/MTP 	(2) 12-fibre MPO/MTP or 24-fibre MPO/MTP 	12-fibre MPO/MTP
Number of Fibres Needed	2 fibres	8 fibres	20 fibres	8 fibres
Maximum Distance	OM3: 300 m OM4/OM5: 550 m	OM3: 100+ m OM4/OM5: 150+ m[1]	OM3: 100+ m OM4/OM5: 150 m[1]	OM3: 70 m OM4/OM5: 100 m

1. 150 metres on OM4 requires low-loss connectors. This is discussed in the channel insertion section.

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 FIBRE OS1/OS2, OM1, OM2, OM3, OM4, OM5, etc.		**NUMBER OF FIBRES** 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)	Ultra high density (UHD)
Panels & cassettes Splice panel	**MTP to LC or SC. Cassette to cassette without MTP** 	**MTP to LC**
Cables/Patch cords	OM2, OM3, OM4, OM5 & OS2 Microcable loose tube	

WHAT'S COMING

IEEE has a number of ongoing projects for both copper and fibre optic applications. The wideband multimode fibre optic (WMMF) TIA & 11801-1 standards were approved for publication in the middle of 2016. ISO/IEC 11801-1 assigned the OM5 designation for this type of fibre. The standard specifies high bandwidth 50 microns core diameter/125 microns cladding diameter, laser-optimised optical fibre that is optimised to enhance performance for single wavelength or multiwavelength transmission systems with wavelengths in the vicinity of 850 nm to 950 nm.

Fibre	Data Rate (Gbps)	IEEE Standard Status	Fibre Pairs	Wavelengths
Multimode	25	Ratified	1	1
	40	Ratified	4	1
		Non-Standard	1	2
			1	4
	50	Draft	1	1
	100	Ratified	10	1
			4	1
		Non-Standard	1	4
		Draft	1	2
	400	Draft	4	2
			4	4
		Ratified	16	1
	800	Draft	4	4

LCS 3
3 DIMENSIONS OF EXCELLENCE
PERFORMANCE SCALABILITY EFFICIENCY

Scalability & Maintenance

1 SLIDING CASSETTE: EASIER MAINTENANCE

2 INNOVATIVE MODULAR CASSETTE SYSTEM

3 FAST PUSH-BUTTON EXTRACTION

COPPER SYSTEM RJ 45 connectors

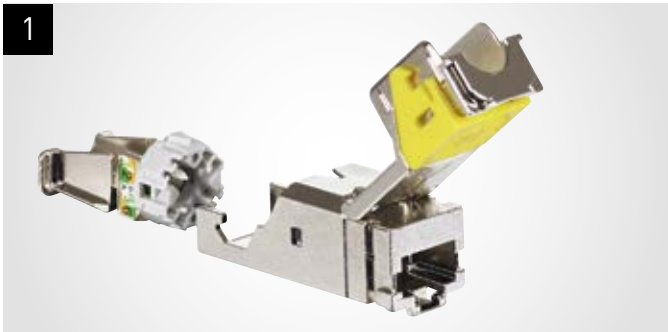
The **TOOLLESS CONNECTORS** with toolless fast connection are available in all categories for installation both on patch panels and in the workstation.
A perfect connection can be obtained in a few seconds, guaranteeing optimum performance of the link from the patch panel to the workstation.
They are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

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

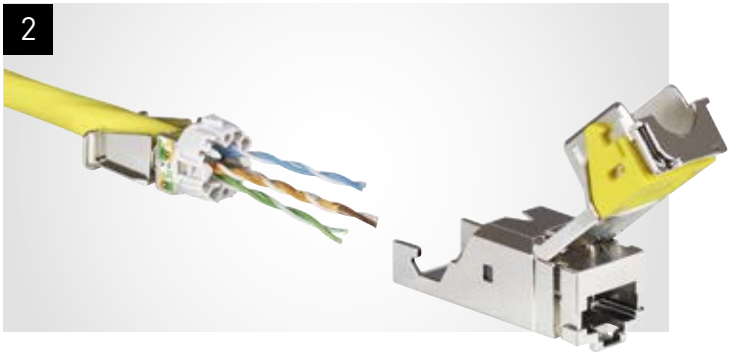
PATENTED DESIGN

Innovative systems to facilitate wiring and installation and increase the data transfer speed with both the copper solution and the fibre optic solution.

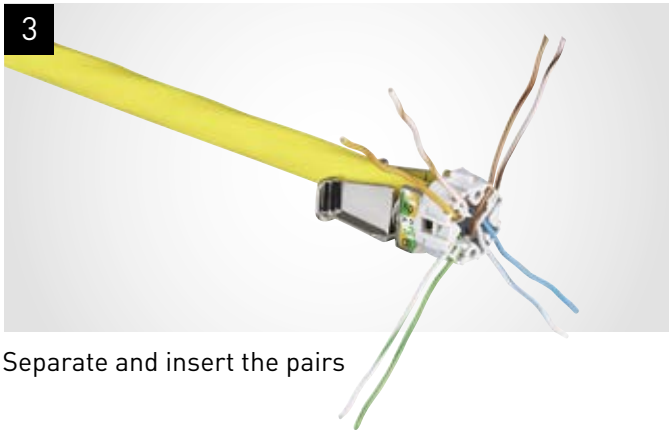
TOOLLESS CONNECTOR CONNECTION PHASES



Take the wire housing

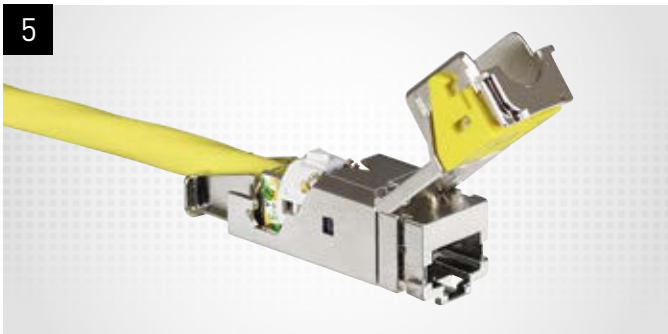


Pass the cable through the back of the wire housing

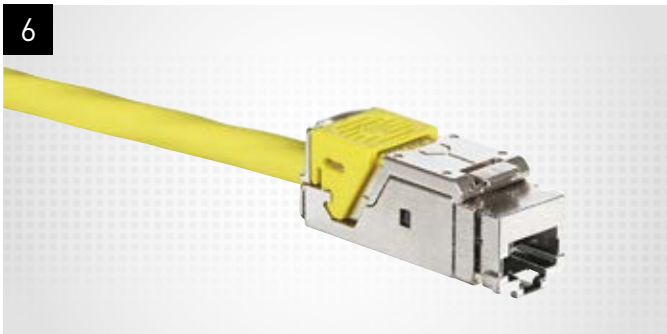


Separate and insert the pairs

Cut the pairs



Install the wire housing without pushing



Push down the lever and lock the connector

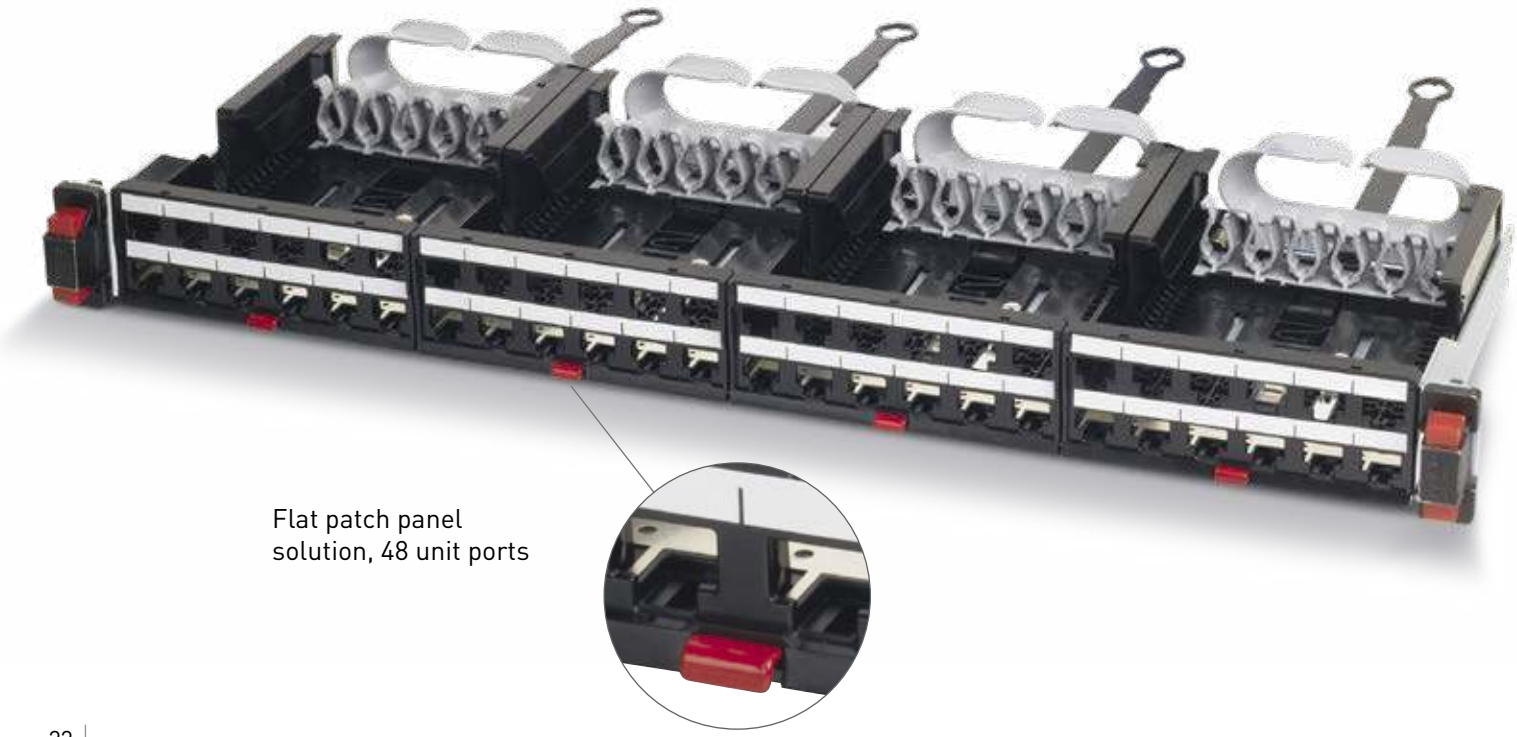
COPPER SYSTEM
Patch panels

The patch panels have been designed and produced to optimise 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.

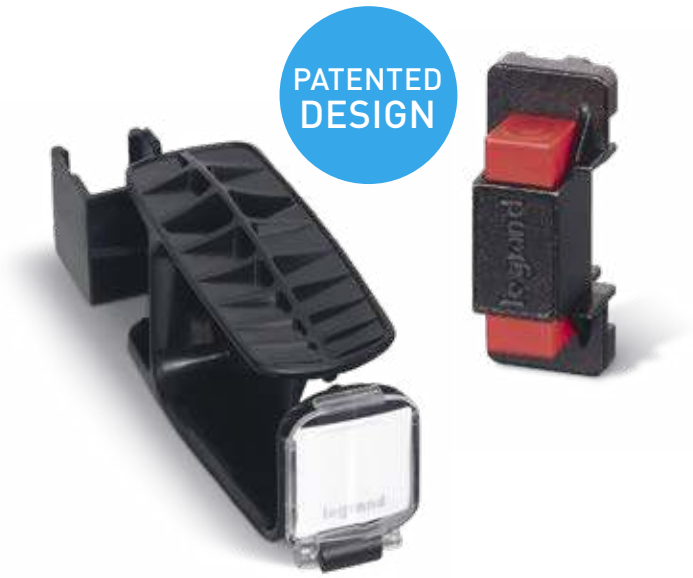
Block of 12 connectors for patch panel

INNOVATIVE CASSETTES

- Sliding cassettes: easier maintenance
- Fast push-button extraction
- Innovative modular cassette system
- Easy maintenance: Remove connectors without disconnecting the cords
- **Easy to mix with Legrand fibre optic solutions**



Flat patch panel solution, 48 unit ports



QUICK-FIX SYSTEM

Innovative quick-fixing solution:

- Push and connect system
- Automatic earth connection
- In-rack cabling optimised
- 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

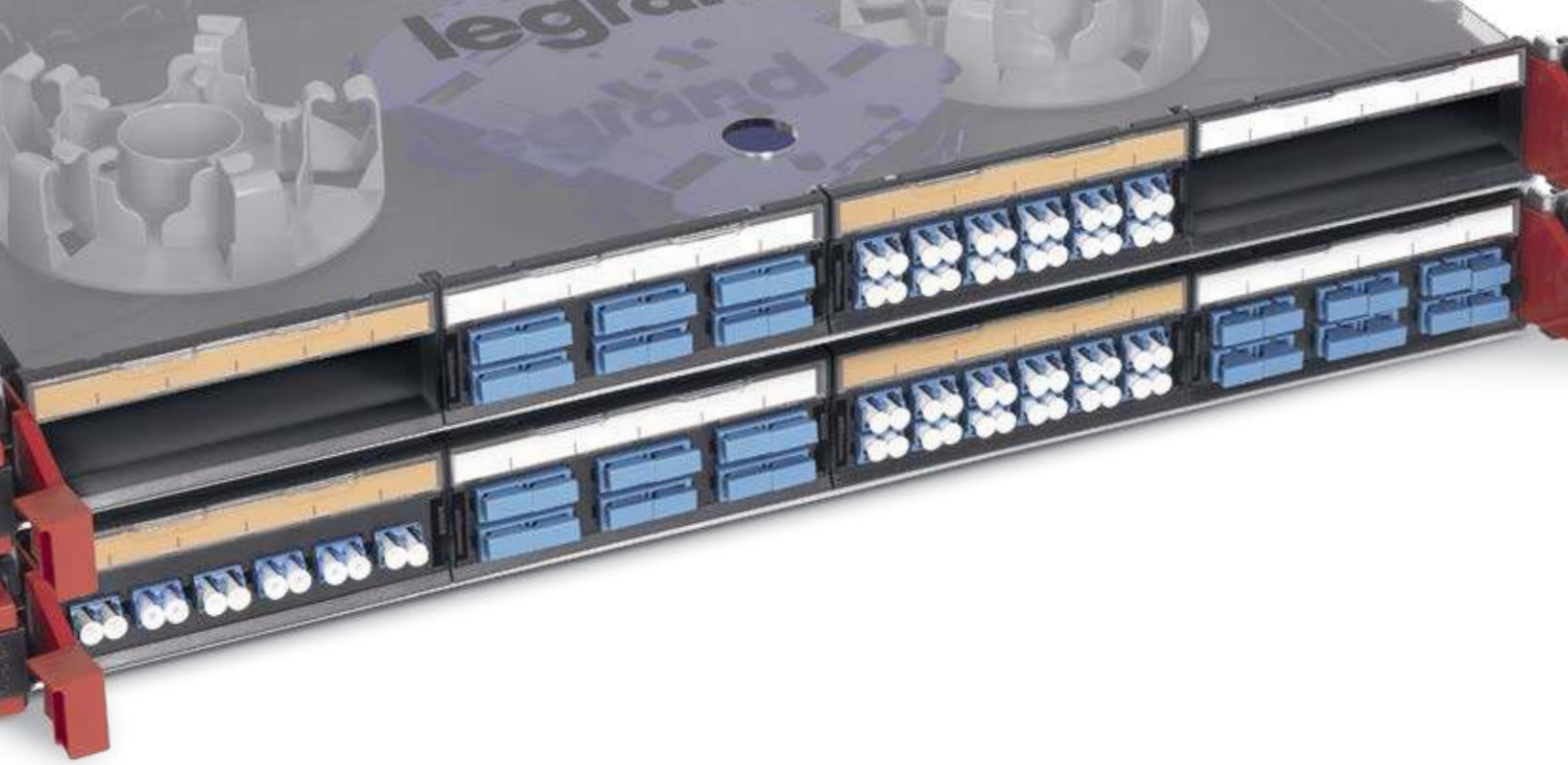
Patch panels with an angled design which allows the cable to run into each side of the rack, creating a correct cable radius of curvature. This avoids the need to manage the cables horizontally, and allows the patch cords to be carried directly in the vertical cavities.

Tidy cable management

Quick-fix system

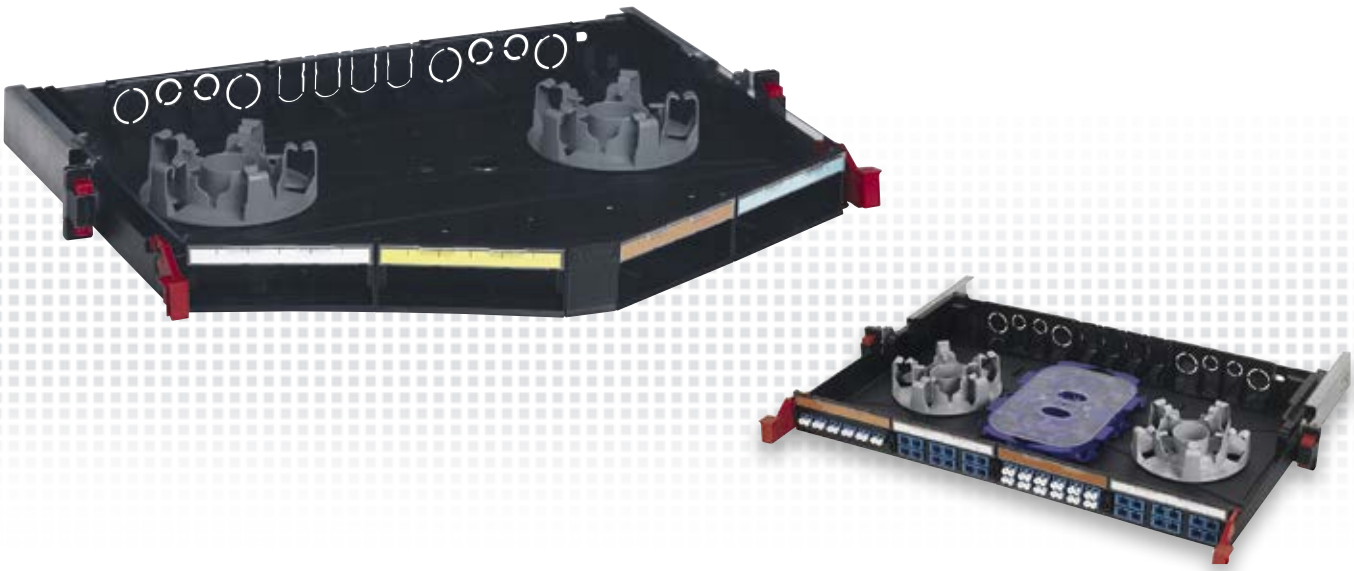
Simple and efficient
identification of the ports

Also available
in the 24-port version



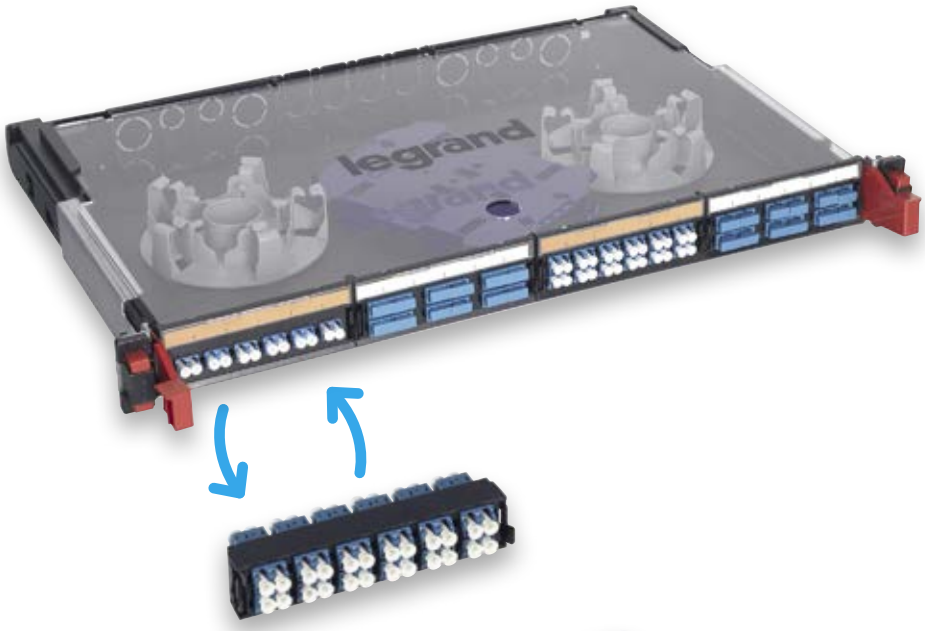
FIBRE OPTIC Panels

Completely renovated and redesigned fibre optic panels & drawers in high and very high density versions from 96 connectors per unit to 144 connectors per unit. Panels with sliding drawers and fast push-button system to facilitate upgrade and maintenance operations.



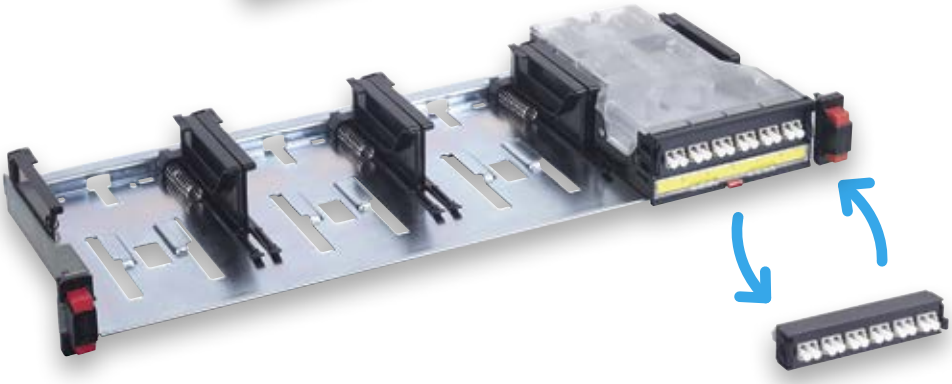
MODULAR PANELS

- Possible to change modular blocks, blank panel, MTP adaptor
- Splice trays to be added if necessary - up to 4 containing 96 LC fibres



HD MODULAR PANELS

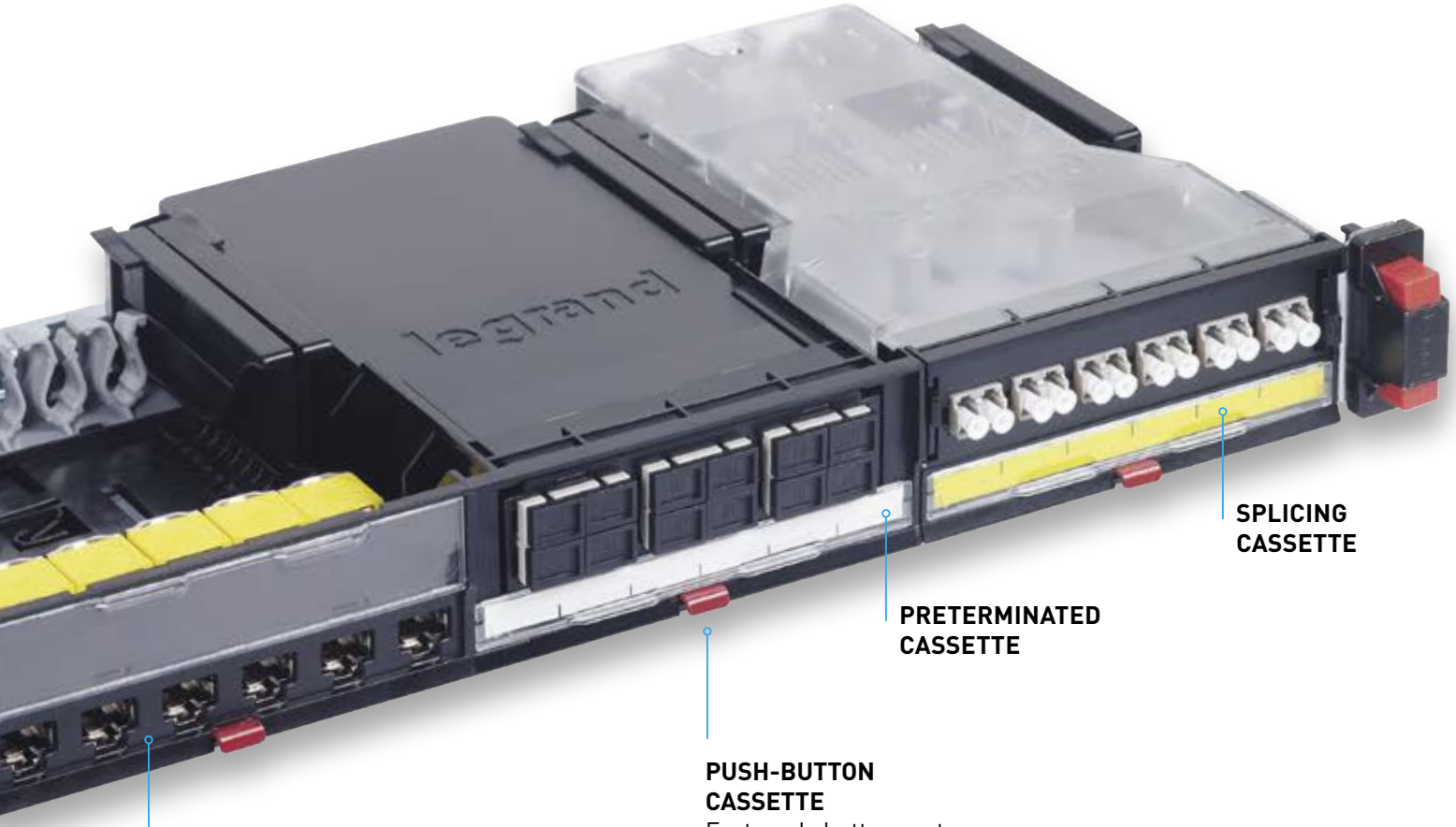
- Innovative quick-fixing solution
- Possible to add splicing cassette with perfectly adapted coiling space
- Mix of fibre/copper on modular panel in drawer



ZERO-U KIT

- Innovative Zero-U kit for universal fixing to give flexibility and space optimisation

FIBRE OPTIC Panels



SPLICING CASSETTE

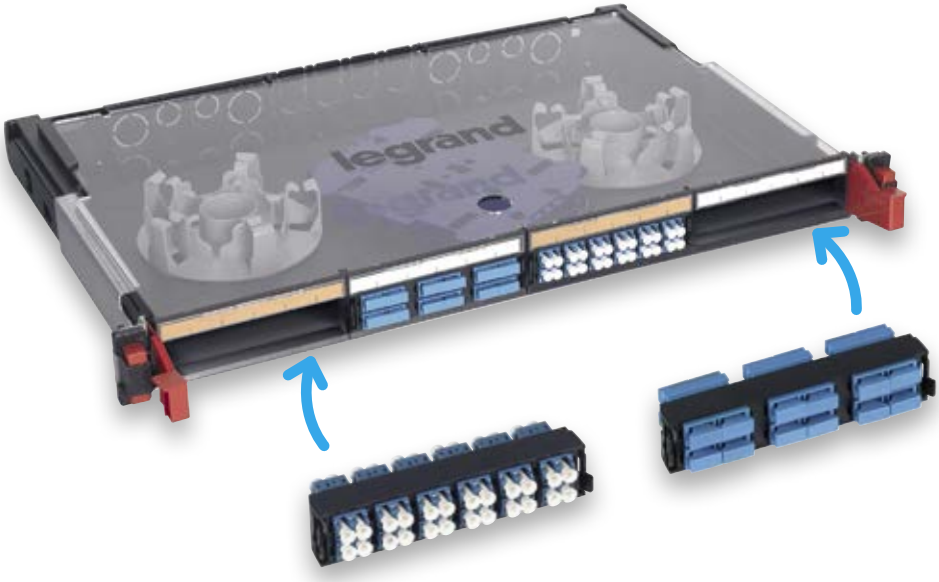
PRETERMINATED CASSETTE

PUSH-BUTTON CASSETTE
Fast push-button system to facilitate upgrade and maintenance operations

COPPER CASSETTE

MODULAR PANELS

- Innovative quick-fixing solution
- Modular blocks to adapt to modular panel or drawer: LC, SC, ST, LC, APC, SC APC
- Possible to add modular blocks, blank panel, MTP adaptor



HD MODULAR PANELS

- Cassettes slide in from front & rear
- Fast push-button on cassette
- Splicing cassette which takes all modular blocks
- Mixture of fibre/copper on cassette panel
- Trunk & cord management system

LCS 3

3 DIMENSIONS OF EXCELLENCE

PERFORMANCE SCALABILITY EFFICIENCY

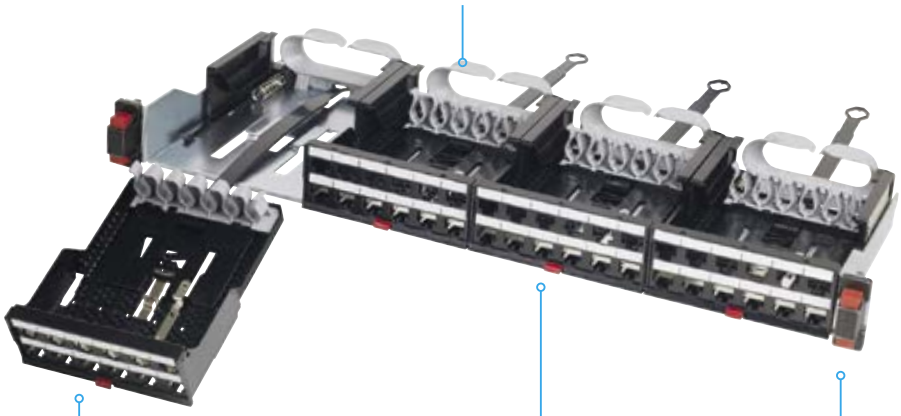
Efficiency

High density

1. 48 ports per Unit for high density
   COPPER SYSTEM
2. 90 LC per Unit for high density
   FIBRE OPTIC SYSTEM
3. 144 LC per Unit for ultra-high density
   FIBRE 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.



FIBRE OPTIC SYSTEM
Very High density up to 144 LC/1U

Since different network architectures such as top-of-rack, end-of-row and middle-of-row require different cabling densities, passive equipment needs to adapt perfectly to the active network. The LCS³ HD cassette panel provides a mixed-media structured cabling system to support any configuration.
Legrand LCS³ offers an innovative UHD patch panel designed to house up to 144 connections in 1 U distributed between 6 individual modules of 24 fibres each.
Each module accepts incoming fibres both from MTP® trunk cables and via predetermined components. Predetermined cables are available both as breakout cables and as distribution cables.

ULTRA HIGH DENSITY UHD

- Up to 144 LC/1U
- 1U, 2U, 4U
- Microcable preterms

HIGH DENSITY HD

- Up to 96 LC/1U
- Mixture of fibre & copper
- Microcable preterms

Preterminated: The fibre optic cable termination is the addition of connectors to each optical fibre in a cable.
The connectors are assembled in our factories

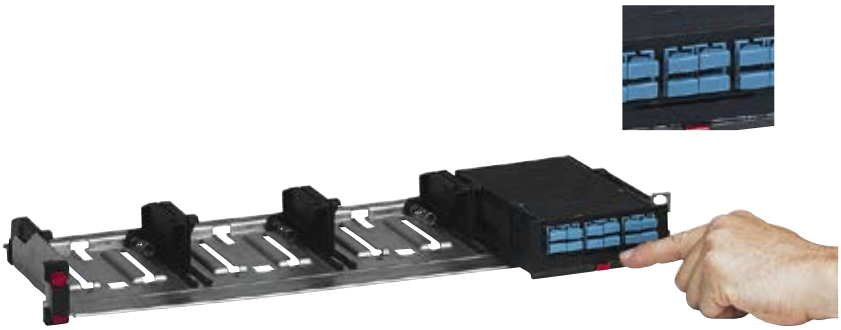
LCS 3
3 DIMENSIONS OF EXCELLENCE
PERFORMANCE SCALABILITY EFFICIENCY

Easy installation

FIBRE OPTIC Cassettes

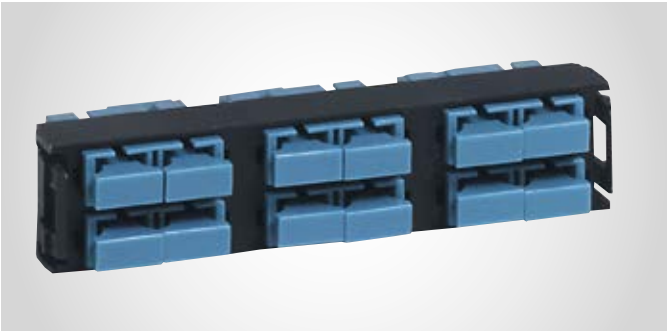
Legrand has launched innovative splicing cassettes which can be removed automatically by simply pressing them, simplifying installation and maintenance.

- 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!

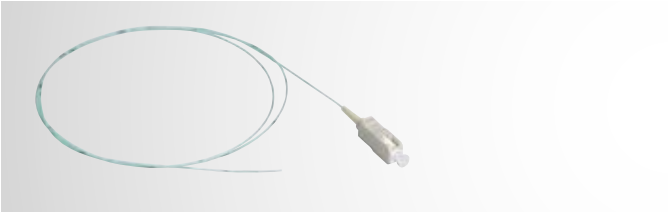
- Pre-equipped cassettes with fitted fibre optic block (SC duplex or LC duplex, monomode or multimode)
- Supplied with sets of 6 or 12 pigtails



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

Set of 12 OM3 LC-PC pigtails

- A very large offer of pigtails in 1 or 2 metres; 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

LCS 3

3 DIMENSIONS OF EXCELLENCE

PERFORMANCE SCALABILITY EFFICIENCY

LEARN ABOUT LEGRAND'S LCS³ DATA CENTRE OFFER ON DEMAND

LCS³ data centre

Enclosure & Aisle containment

Performance, scalable & efficient solutions

Legrand LCS³ has an extensive portfolio of enclosures and aisle containment systems for your data centre and/or server room. The Legrand LCS³ is ideal for the installation of (blade) servers, switches, patch panels, routers and storage equipment. Modularity and flexibility are always key in the design of our products.

LCS³ SERVER-AND-NETWORK RACK

The server-and-network racks are versatile and modularly constructed. Which type of rack is most suitable depends ultimately on its application.

The server-and-network racks are available in varying heights, widths and depths. The 600 mm wide rack is a compact rack with a high carrying capacity on a small surface. The 800 mm wide rack is ideal for patching, network and server equipment with enough space for power and network cabling.

AIRFLOW OPTIMISATION

Data centres are increasingly using energy-efficient cooling techniques such as free cooling and fresh air cooling. The first step in this process is separating the warm and cold air using aisle containment solutions.

The next step is airflow optimisation in the rack. This step, however, is often not fully or effectively implemented, although it is the next step in energy-efficient data centres. Airflow optimisation is also important for the server, network and storage equipment to work properly, for temperature control and for the general stability of a data centre.

Using airflow optimisation you can achieve the highest levels of airtightness. The side sealing plate and the side sealing panel are covered with foil. Every assembly opening in the side sealing panel is still usable, but all unused openings are sealed with foil to prevent air leakage. The base and roof plates have an identical level of airtightness. Special foam pieces are even placed around the rails on the base.

Cable brush

Cable entry foam

Cable entry plate

LCS 3 DIMENSIONS OF EXCELLENCE
PERFORMANCE SCALABILITY EFFICIENCY

LCS³ Racking Systems

ETL Endless customised solutions

Enclosure Technology specialises in the manufacture and supply of 19" rack enclosures to the computer, broadcasting and telecommunications industries. ETL supplies a comprehensive choice of server cabinets suitable for Compaq, HP, IBM and Siemens-Nixdorf servers and other compatible brands. All ETL enclosures can be fitted with an extensive selection of accessories such as sliding keyboard shelves, monitor shelves, power distribution and fan cooling.

FEATURES & BENEFITS

ETL offers both **Custom** and **Standard** solutions. Custom racks available to match client specifications. Comes fully assembled while standard range has the option to be flat packed.

STANDARD FEATURES

- Lockable doors and side panels
- Easily removable side panels
- Quick release doors with concealed hinges
- Levelling feet, plinths or caster wheels

NEW ZEALAND MADE

CUSTOM BUILDS

MULTIPLE DOOR OPTIONS

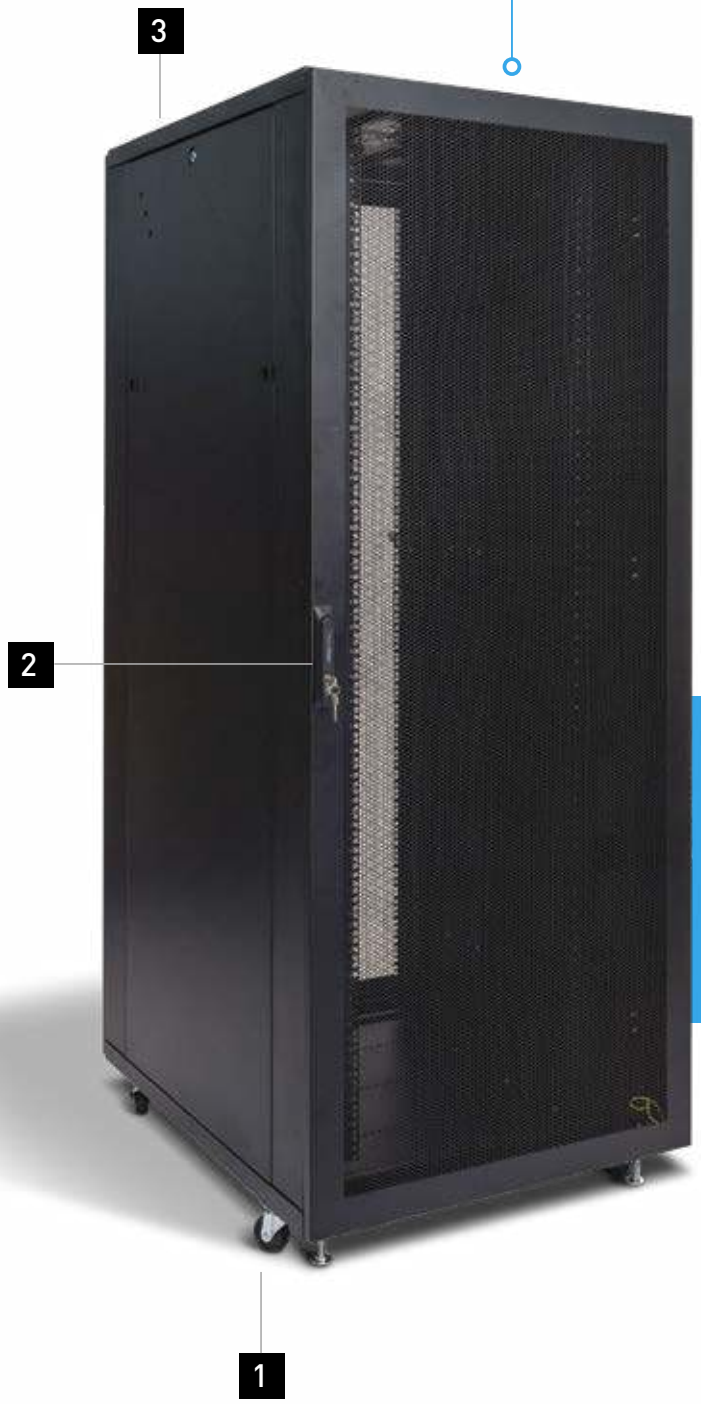
MESH OR PUNCH DOORS

DOUBLE DOORS

SPLIT CABINETS – CUSTOM BUILDS

- Freedom to customise cabinet depending on requirements and specifications
- Front and back doors are lockable and top and bottom door locks can be keyed differently or alike
- Flush fitting locking system
- Width from **600mm to 800mm**
- Depth from **600mm to 1200mm**
- Available in 47U – 45U – 42U –38U –33U –24U –18U – 12U
- Left or right hand hinge available
- Steel and perspex doors are also available
- Dust filters for ventilation slots are available on request
- The standard colour is ETL charcoal. Optional alternative colours on request
- Cable entry provided from the top and bottom
- Bolt down kit or plinths

SmartRak® 2.0
Cost effective, efficient and reliable server rack system



AN OPTIMISED SOLUTION

SmartRak® 2.0 is an improved multi-purpose rack system that is scalable and flexible for all kinds of Data Centre and Lan applications. The cabinet is strong and versatile for large cable management from top or bottom.

FEATURES & BENEFITS

- Static load rating of 1200KG.
- Full height door for better ventilation.
- 3 times bend panel mounting for a stronger structure.
- Save assembly time with flat packs with the new simplified design with lesser parts to fix.

SPECIAL FEATURES

1

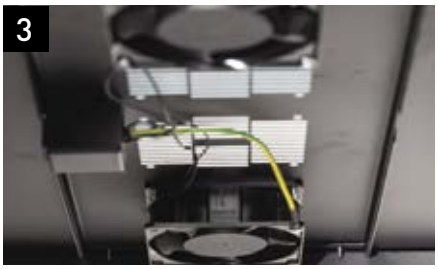
HEAVY DUTY CASTOR WHEELS WITH ADJUSTABLE FEET

2

ROBUST SWING HANDLE LOCK SET

Access control door handles available when high security level is required.

3



FAN TRAY

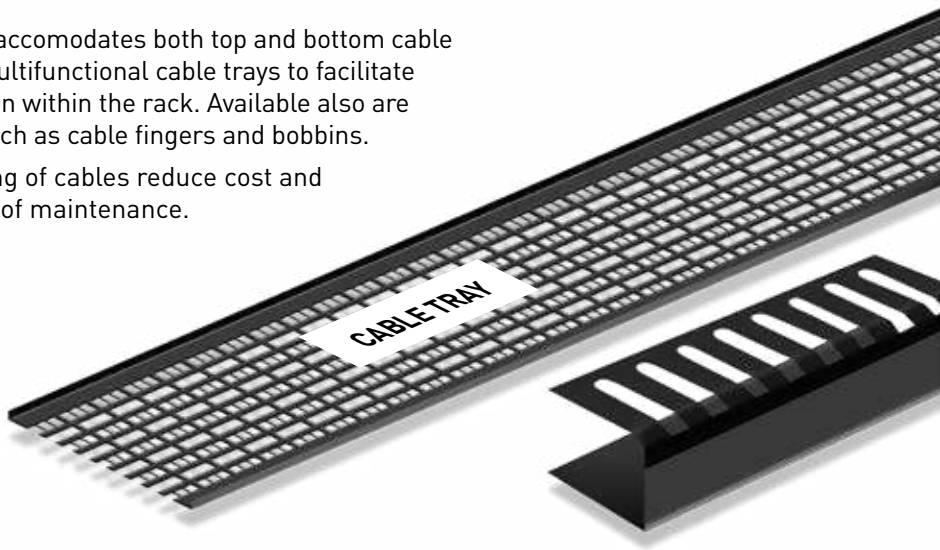
Cooling makes up to 70% of total energy costs. Effective cooling strategies can mitigate energy losses which translate into cost savings.

THE RACKS ARE DESIGNED WITH ADEQUATE SPACE FOR MAINTENANCE PERSONNEL TO EASILY ACCESS THE CABLE INSTALLATION DURING MAINTENANCE.

CABLE MANAGEMENT

SmartRak 2.0 accomodates both top and bottom cable entries with multifunctional cable trays to facilitate neat installation within the rack. Available also are accessories such as cable fingers and bobbins.

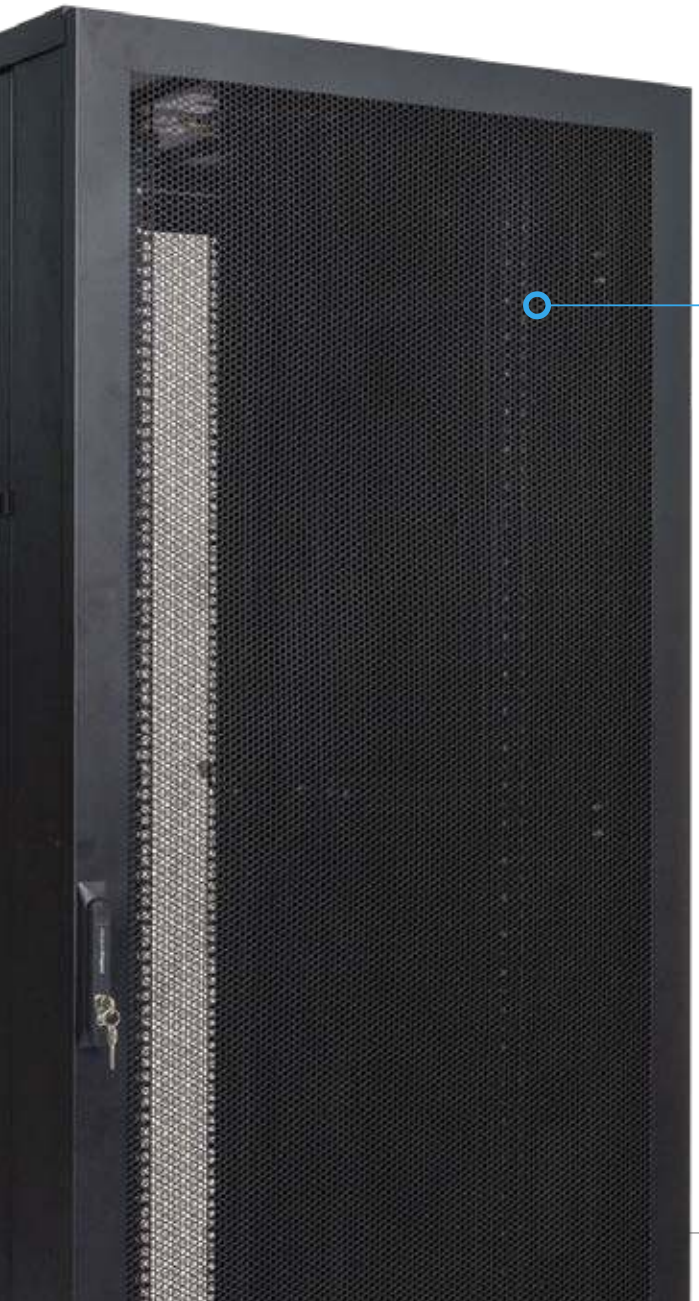
Efficient routing of cables reduce cost and facilitate ease of maintenance.



LCS 3 DIMENSIONS OF EXCELLENCE
PERFORMANCE SCALABILITY EFFICIENCY

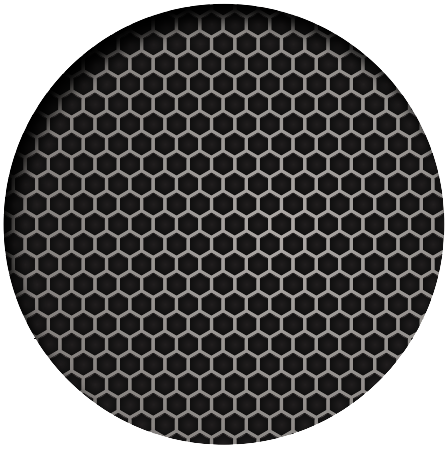
LCS³ Racking Systems

SMARTRAK® 2.0
Airflow management



EFFECTIVE VENTILATION

With perforated doors, SmartRak's racking solution enables data centres to achieve greater cooling efficiency, resulting in more efficient use of energy.



EFFECTIVE COOLING

SmartRak 2.0 efficently controls temperature levels, which maintain best IT equipment performances and increase their life time.

EZRAK
Wall mount cabinet

EzRak® Wall Mount cabinet has been designed to provide a solution where side access is needed during installation, service and maintenance.

PIVOTED SWING FRAME WALL MOUNT CABINET

This cabinet has been designed to provide a solution where side access is needed during installation, service and maintenance. The pivoting body allows free access to the rear of the cabinet to facilitate installation and maintenance. Cable access from top and bottom provide via removable gland plates. To ensure ventilation options, the wall box has pre-punched fan pattern at the top for up to two exhaust fans. Maximum versatility is provided with removable side panels and front door to ease installation.

FEATURES & BENEFITS

- 6 height options (6U, 9U, 12U, 15U, 18U and 24U)
- Depth: 500mm + 100mm mounting depth
- Width: 600mm
- Welded frame (Pivoted swing)
- Front and side access (Spring pin removable type)
- Quick release reversible safety glass door
- Light weight strong construction
- Adjustable 19" panel mounts and front tray (1U)
- Exhaust fan
- Load rating 40kg
- Fixing kit supplied
- Color: Ral 9005 black
- Material: Cold rolled steel with panel mounting finished with Blue Zinc

LCS 3
3 DIMENSIONS OF EXCELLENCE
PERFORMANCE SCALABILITY EFFICIENCY

Innovative & high-performance PDUs

GENERAL CHARACTERISTICS

- Anodised 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 international type sockets

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 60309 - Industrial plugs

Certification: CE, TSE, CCC

Environmentally-friendly products
Eco-design

RoHS

SOLUTIONS FOR ANY CONFIGURATION
A wide universal range

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.

ZERO-U PDU

P.50 to 51

FOR DATA CENTRES/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''

P.52 to 53

FOR DATA CENTRES, 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''

P.52

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

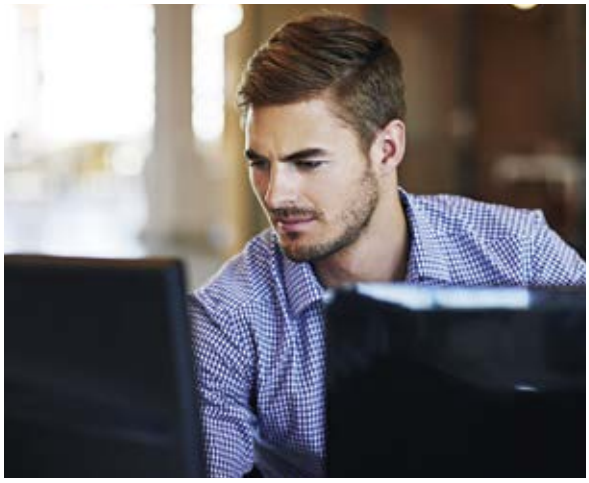
LCS 3
3 DIMENSIONS OF EXCELLENCE
PERFORMANCE SCALABILITY EFFICIENCY

Innovative & high-performance PDUs

Legrand Metered and Switched models provide the most common power supply configurations to meet the needs of data centres and local networks.

BASIC PDUs

P.50 to 53



ENERGY DISTRIBUTION
For implementation in LANs or data centres, these are easily mounted and have numerous configuration options

AVAILABLE IN VERTICAL ZERO-U AND HORIZONTAL 1U 19" VERSIONS

EFFICIENT POWER SUPPLY MANAGEMENT
Incorporating intelligent, innovative functions

PDUs can help meet the needs for energy while incorporating intelligent functions, including real-time power metering and environmental monitoring. Connected PDUs (iPDUs) include measurement of consumption and switching of active power and remote alarm with volts, amperes, real-time power (kW) and energy (kWh) measurements.

METERED & SWITCHED iPDUs P.56 to 61

POWER SWITCHING AND REAL-TIME MONITORING
With input metering and output level switching, these can be used to remotely control the power of devices and supply the necessary information as needed. Multiple configurations are available

METERED iPDUs P.60

ACCURATE MEASUREMENT
With input metering, Legrand PDUs can provide accurate energy consumption measurements. Multiple configurations possible

PDU FUNCTIONS BY RANGE	BASIC	METERED	SWITCHED
Phase measurement (kWh, V, A, PF)		•	•
Circuit measurement (kWh, V, A, PF)		•	•
Circuit breaker trip detection		•	•
Socket management (Switching & Control)			•

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.
Function integrated in all Legrand PDUs: Basic, Metered, Metered and Switched.

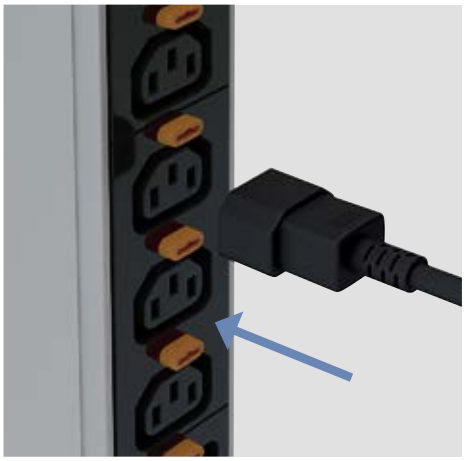
EASY IDENTIFICATION

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

AN INNOVATIVE TECHNICAL SOLUTION

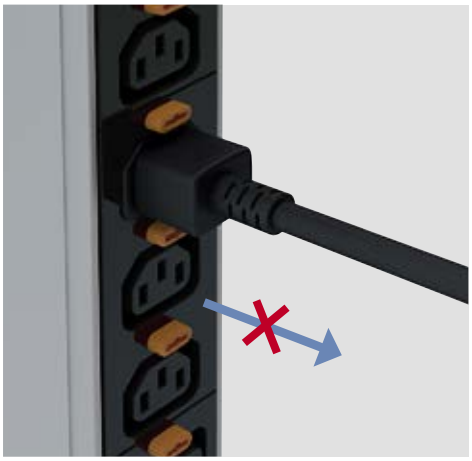
CORD LOCKING SYSTEM

CORD CONNECTION



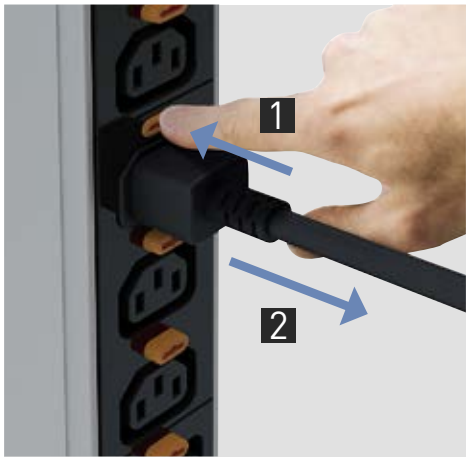
The cord is connected to the socket naturally in one smooth action

AUTO LOCKING



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

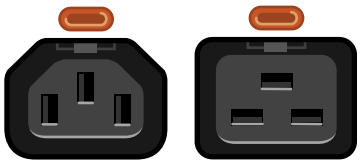
UNLOCKING



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

UNIVERSAL SYSTEM

Takes all cords for standard C13 and C19 sockets

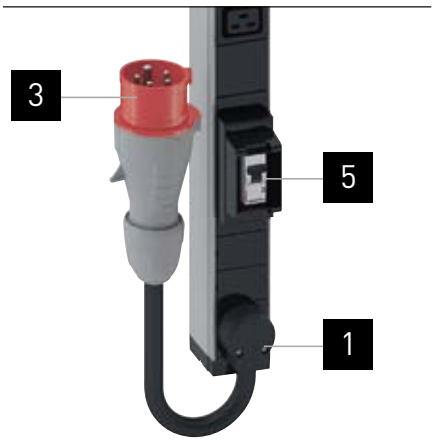


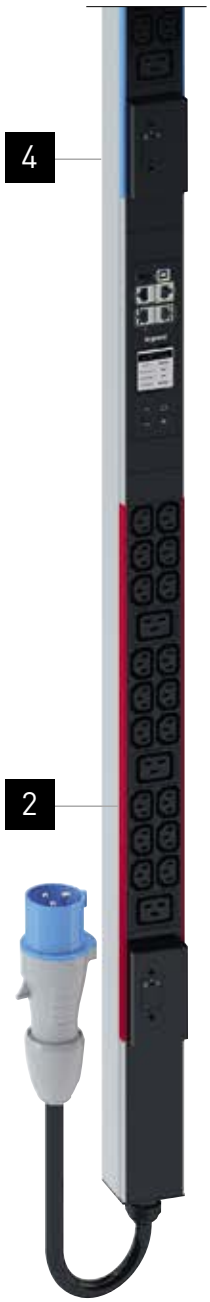
EXCLUSIVE TO LEGRAND

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.



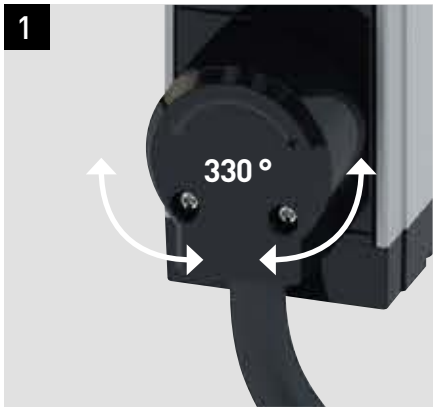


VERTICAL INSTALLATION

CORD LOCKING SYSTEM

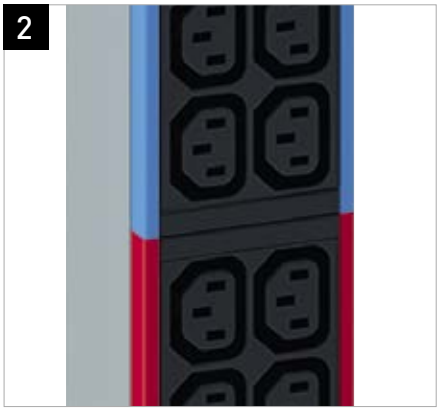
STANDARD STRUCTURE FOR BASIC, METERED & SWITCHED PDUs

ROTATIVE CABLE ENTRY



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

CIRCUIT MARKING

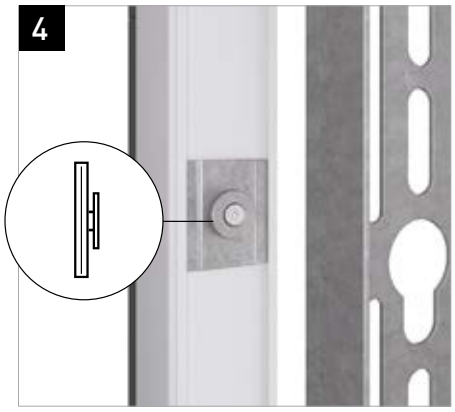


CIRCUIT IDENTIFICATION
Each circuit is colour-coded, with the colour visible on the front panel and along the edges of a module. The colour corresponds to the specific MCB protecting the circuit.

IEC INDUSTRIAL PLUG

ENHANCED PROTECTION
There are multiple solutions depending on power supply requirements

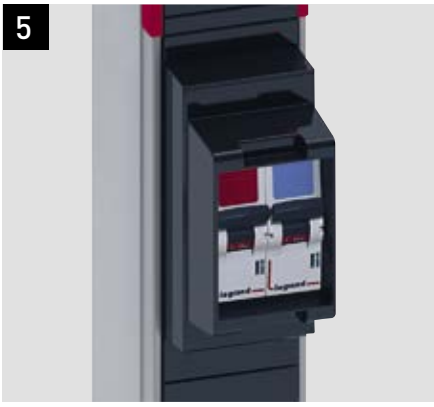
SCREWLESS MOUNTING



FIXED IN BUTTONHOLE SLOTS
ZERO-U PDUs simply clip vertically into buttonhole slots on the mounting bracket without the need for any screws.

OPTIONS FOR BASIC PDUs ONLY

CIRCUIT BREAKER HOLDER

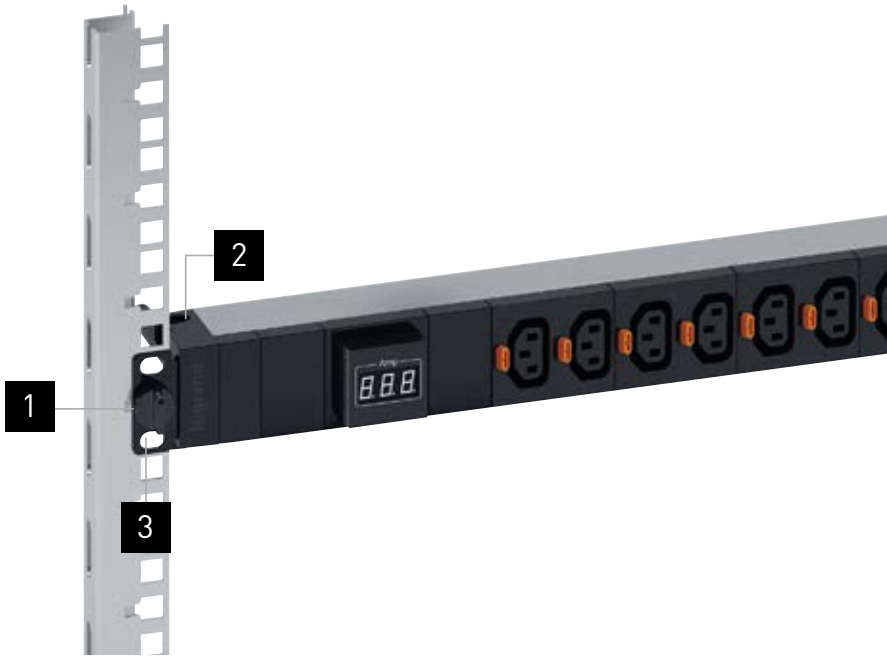


ENHANCED PROTECTION
Circuits protected by a circuit breaker.
Holder with overhanging edges to prevent accidental breakages.
(Cover available on request)

EXCLUSIVE TO LEGRAND

INNOVATION & CONVENIENCE
Simple setup and 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

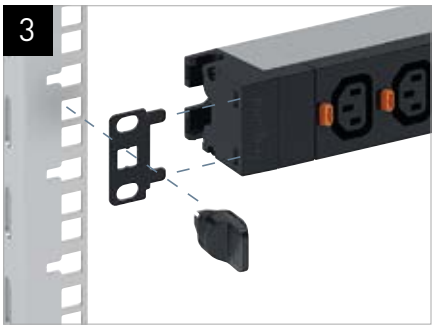
SNAP-ON FIXING

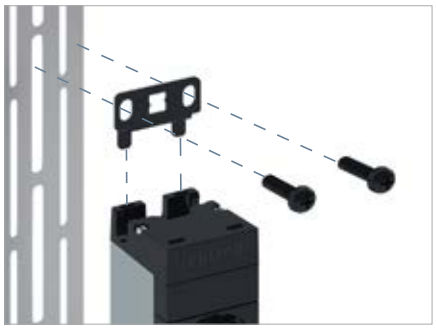
TOOLLESS INSTALLATION
Snap-on fixing on 19" uprights
No need for screws or nuts.
Toolless installation.

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

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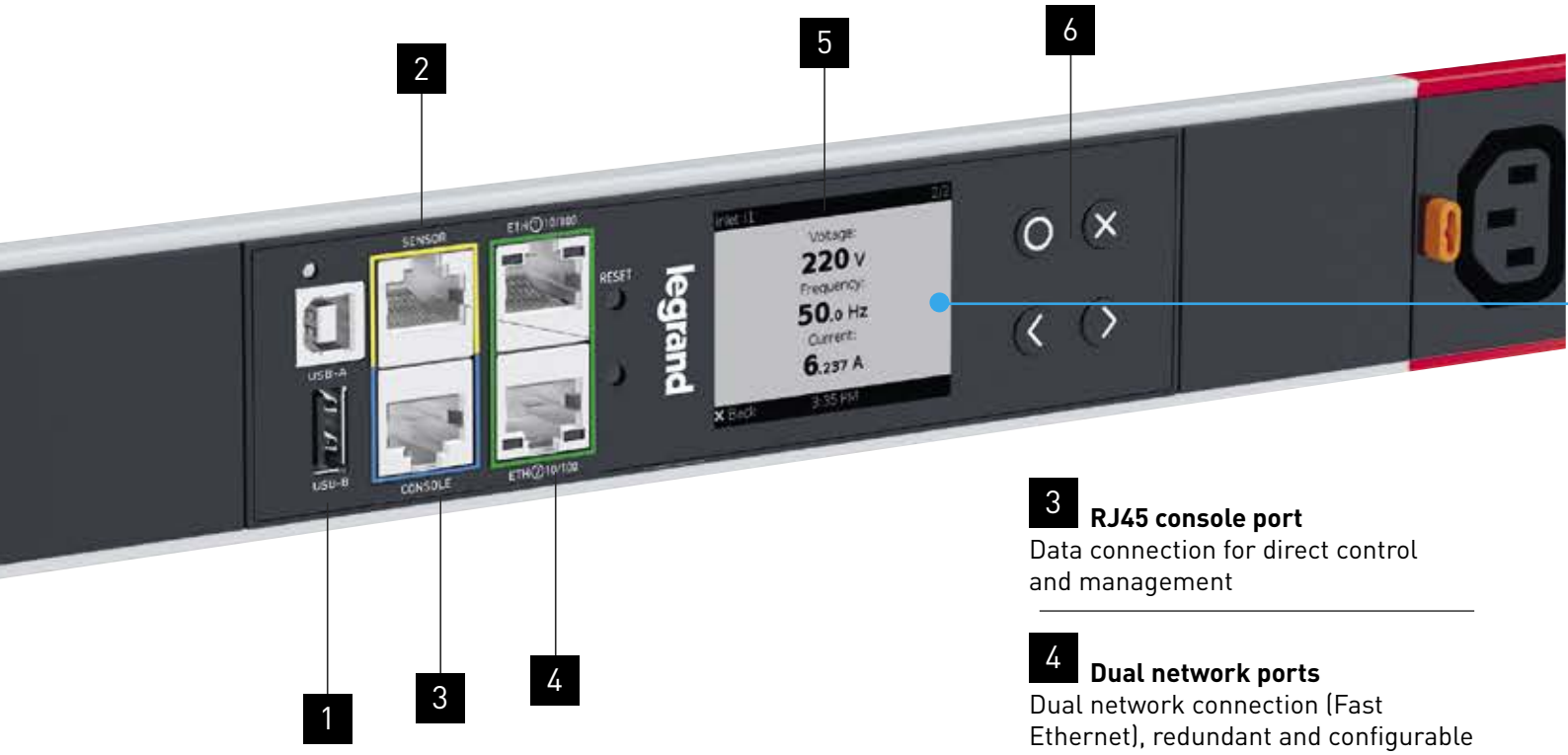
PDUs: measurement, metering & consumption



1 USB-A and B ports
USB A and B ports for connecting peripheral devices, so data can be viewed on smartphones

2 RJ45 sensor port
Plug & Play sensor port for directly connecting temperature and humidity sensors and the Raritan SmartSensor™ range

3 RJ45 console port
Data connection for direct control and management

4 Dual network ports
Dual network connection (Fast Ethernet), redundant and configurable for access to the PDU from 2 different networks, ideal for Colocation projects or for daisy-chaining PDUs

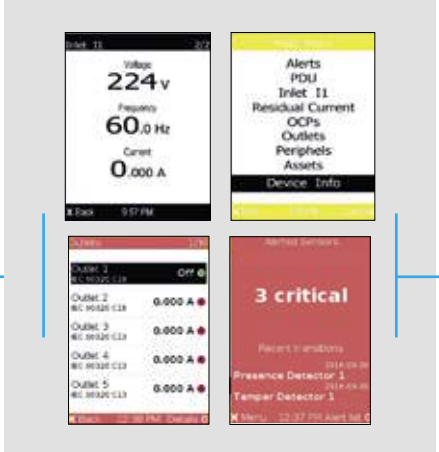
5 LCD colour screen
220 x 176 mm super bright screen with configurable measurement data display

6 Intuitive navigation buttons
Navigation buttons for local screen

CONTROLLER: THE HEART OF iPDUs
A wide, bright colour LCD display

The Legrand PDU controller allows local access to all critical measurement data. The bright colour LCD display will change colour according to the alert level detected by the iPDUs; your field technicians can quickly identify iPDUs on which the thresholds have been exceeded, obtain correct power supply data immediately and take appropriate action.

LOCAL DISPLAY



PDU HTML USER INTERFACE

ADAPTIVE COLOUR SCREEN
The LCD display on the unit changes colour according to the alert level, making it easier for the technical teams to see the information

DIRECTLY ACCESSIBLE DATA
Makes it easier to view the data centre power supply data and information about the environment. The responsive Web graphic interface can be accessed from any device or tablet, or directly from a desktop computer. The redesigned overview screen provides the most important information at a glance, so you can easily monitor your PDU health and critical data, and also view the cabinet energy consumption in real time.

DCIM MONITORING

Legrand Metered and Switched PDUs can be used to export measurement and control data to any DCIM platform such as Sunbird Power IQ .

Sunbird

METERED & SWITCHED iPDUs ADVANCED MONITORING

Gold standard accuracy

The first step in preventing outages in your data centre consists of making sure that you have the most reliable and accurate monitoring data. Legrand iPDUs are certified to have +/- 1% measurement accuracy with all types of load in real time, you can be sure that your PDU is supplying the necessary information as and when needed.

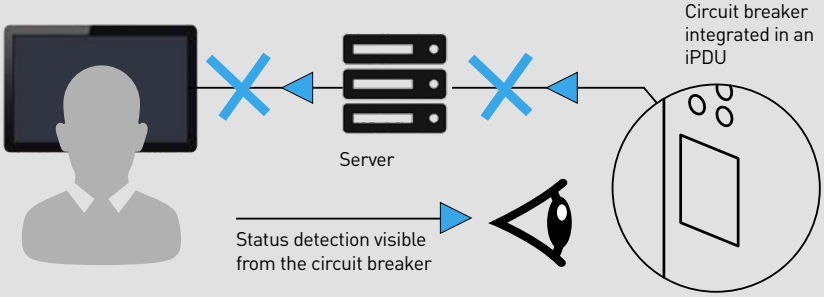
ACCURATELY MEASURED ENERGY CONSUMPTION

REAL-TIME MEASUREMENT
With Legrand's Metered and Switched PDUs, a billing-grade energy metering chip is dedicated to the Inlet power supply module and provides extremely accurate KWH data for each tap-off circuit.

+/-1% HIGH-PERFORMANCE INPUT MEASUREMENT
Legrand PDUs benefit from the metering technology of Raritan, delivering a high-end measurement performance, which gives a clear picture of energy consumption.

CIRCUIT BREAKER INTELLIGENCE AND BRANCH CIRCUIT MONITORING

If a server power supply fails, your energy management system in the electrical panel will not detect this condition, only detection of the circuit breaker trip status will keep you informed in real time!



MONITORING CURRENT AND VOLTAGE AT THE CIRCUIT BREAKER LEVEL

Legrand iPDUs are equipped with standard Circuit breaker status monitoring and branch circuit metering (on 32A models), providing critical load-balancing and circuit load information per phase.
This allows you to be alerted in time and avoid circuit overloads.

They can also be used to activate configurable alerts when a measurement is exceeded or when a circuit breaker drops.
You are directly informed of the loss of power and can react quickly, preventing overloads on other circuits.

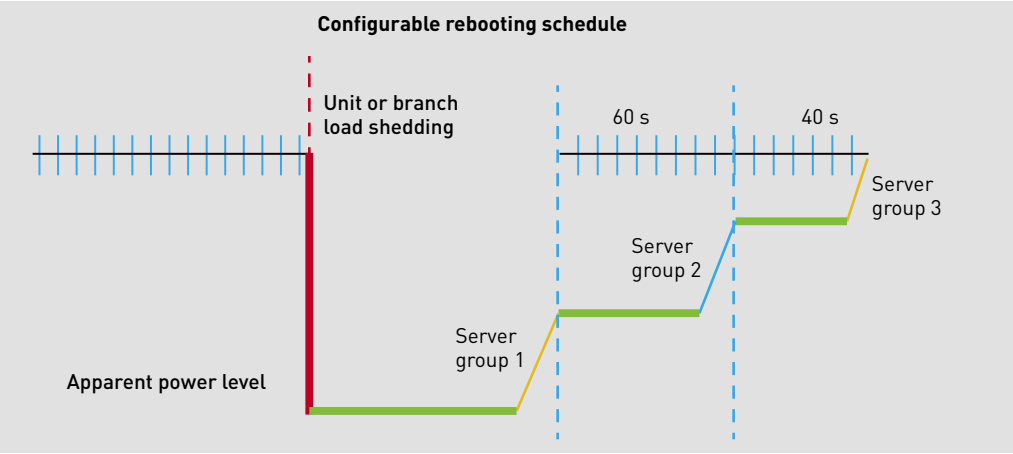
CIRCUIT OVERLOAD ALARM

Alarms defined by the user warn the IT managers and data centres of potential circuit overloads so as to prevent accidental loss of power to critical equipment.

SWITCHED iPDUs METERING & CONTROL
Easier power management

Legrand iPDUs also integrate input metering and output level switching, providing granular power switching of each device connected to the iPDU, and making it easier to manage IT installations remotely, while helping to improve availability.

CONFIGURABLE OUTLET REBOOTING SCHEDULE



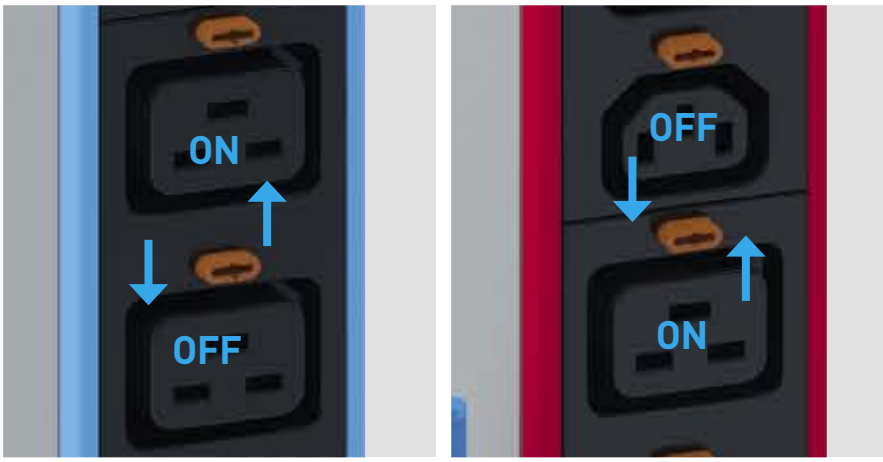
OUTPUT CONTROL
Automated restarting, load shedding and individual output control of socket outlets. Used to schedule restarting on each socket outlet in order to minimise the impact of the peak current on the servers.

AVAILABLE IN VERTICAL ZERO-U AND HORIZONTAL 1U 19" VERSIONS

CIRCUIT BREAKER INTELLIGENCE

MAGNETIC-HYDRAULIC CIRCUIT BREAKER
Above 16 Amps, Legrand iPDUs have rugged circuit breakers with delayed tripping curve, guaranteeing maximum flexibility and safety of people and equipment.
The circuit breakers are monitored by the embedded firmware and issue configurable alerts in the event of an overload or unwanted tripping.

REMOTE SOCKET OUTLET MANAGEMENT



CONFIGURABLE CIRCUIT MANAGEMENT
Option of remotely switching sockets between one another and activating or deactivating individual sockets in real time on the network and managing the power sequencing of your device.
The use of switched models allows users to deactivate unavailable sockets remotely and avoid overloading the circuits by plugging in additional devices.

PROTECTION AGAINST UNCONTROLLED CONNECTIONS

REMOTE SOCKET MANAGEMENT
Remote socket management prevents human errors and can check that devices are only plugged in on available circuits, thus preventing overloads.

METERED iPDUs ENERGY METERING

See all consumption at a glance

Legrand iPDUs incorporate input metering, allowing accurate measurement of the unit's energy consumption, making it easy to understand power and manage data centre growth.

CONNECTED LOADS

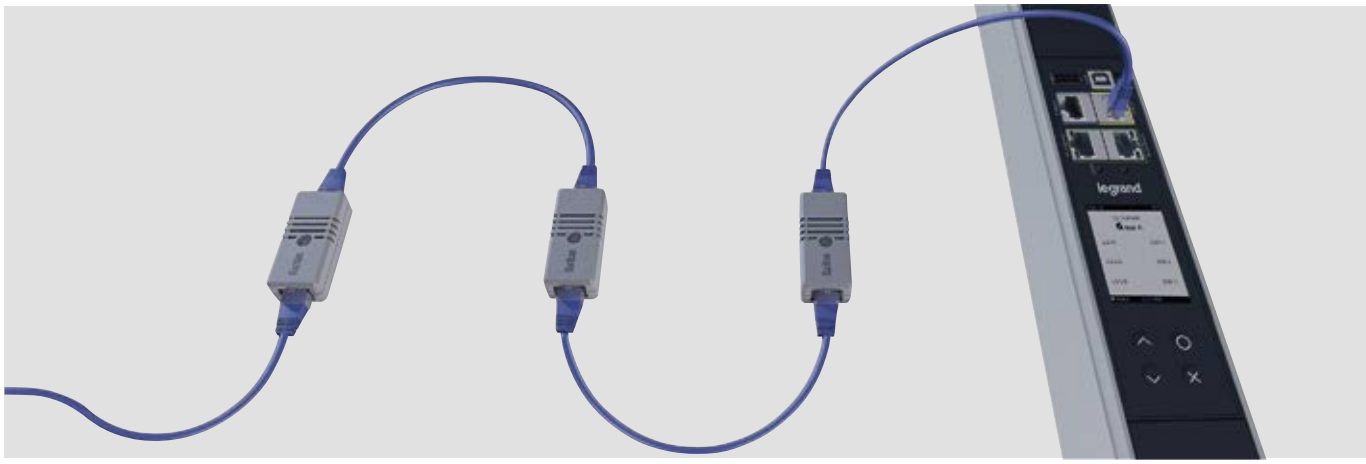
EASIER DATA COLLECTION IN THE CABINET
No more need to call in the technical teams to take on-site measurements in order to find out the energy consumption of your equipment, your intelligent iPDU takes care of it for you....

UNIT POWER
The overview of the rack power capacity and energy use makes it easy to understand clearly the remaining capacity in the cabinet so as to assist decisions about future growth.

Metered & switched with Raritan peripherals

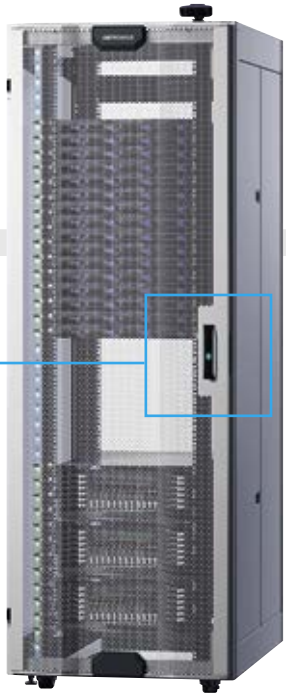
By incorporating the Raritan technology platform, Legrand iPDUs benefit from the whole range of **SmartLock**™ electronic door handles, and **SmartSensor**™ environmental monitoring products. These plug and play peripherals make it easy to oversee the whole installation directly from your iPDU!
SmartSensor™ includes: temperature, humidity and contact closure sensors.
SmartLock™ includes: simple electronic handles, plus 125 kHz and 13.56 MHz card reader handles.

RARITAN SMARTSENSORS™



EASIER CONNECTION AND INTEGRATION

RJ45 technology simplifies the connectivity and implementation of sensors. All Raritan SmartSensors are easily integrated in the cabinet and can be connected in a daisy-chain and replaced without having to rewire the cabinet.
www.raritan.com/smartsensors



RARITAN SMARTLOCK™

SIMPLIFIED ACCESS, CONTROL AND COMPLIANCE

Plug and Play with Raritan SmartLock™ electronic handles, Legrand iPDUs allow you to control and secure access to the cabinet with ease
www.raritan.com/smartlock

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PDUs: accessories for protection

ENHANCED SAFETY AND 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.

MULTI-APPLICATION DIN RAIL

Mount modular devices such as circuit breakers, Legrand multimedia network components, etc

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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.

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. It 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.

01 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.

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

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

WARRANTY 25 YEARS PERFORMANCE legrand

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

Evolution of standard 11801 Edition 3 - 2018

Introduction

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 organisation's effectiveness.

Historically, the cabling within premises comprised both application-specific and multipurpose networks. The original edition of this standard enabled a controlled migration to generic cabling and the reduction in the use of application-specific cabling. The subsequent growth of generic cabling designed in accordance with ISO/IEC 11801 has:

a) contributed to the economy and growth of Information and Communications Technology (ICT)
b) supported the development of high data rate applications based upon a defined cabling model, and
c) initiated development of cabling with a performance surpassing the performance classes specified in ISO/IEC 11801:1995 and subsequent editions:

- ISO/IEC 11801:1995 (Ed. 1) - first edition
- ISO/IEC 11801:2000 (Ed. 1.1) - Edition 1, Amendment 1
- ISO/IEC 11801:2002 (Ed. 2) - second edition
- ISO/IEC 11801:2008 (Ed. 2.1) - Edition 2, Amendment 1
- ISO/IEC 11801:2010 (Ed. 2.2) - Edition 2, Amendment 2

The 3rd Edition of ISO/IEC 11801 is now a multipart standard with the structure shown below.

ISO/IEC 11801 3rd Edition

General requirements (11801-1)
Specific requirements for premises:
- Offices & commercial buildings (11801-2)
- Industrial premises (11801-3)
- Homes (11801-4)
- Data centres (11801-5)
- Distributed building services (11801-6)

The International Standard ISO/IEC 11801-1 will specify requirements for balanced twisted-pair copper (Classes A, B, C, D, E, EA, F, FA, I and II), and fibre optic (OM1, OM2, OM3, OM4, OM5, OS1a, and OS2) cabling systems used in offices (ISO/IEC 11801-2), industrial buildings (ISO/IEC 11801-3), homes (ISO/IEC 11801-4), data centres (ISO/IEC 11801-5), and for the distribution of services in buildings (ISO/IEC 11801-6). This standard series will specify the structure and minimum configurations of generic cabling, performance requirements of channels, links, connecting hardware and cords, implementation requirements, compliance requirements and verification procedures, and interfaces. Requirements for cable performance are made via reference to applicable IEC standards.

Dealing with balanced twisted-pair cabling, new Classes I and II are specified with Category 8.1 (RJ45 connectors) and Category 8.2 (proprietary connector) components respectively.

Balanced Twisted-Pair Class Specifications of ISO/IEC 11801-1:

- Class A is specified up to 100 kHz
- Class B is specified up to 1 MHz
- Class C is specified up to 16 MHz
- Class D is specified up to 100 MHz
- Class E is specified up to 250 MHz
- Class EA is specified up to 500 MHz
- Class F is specified up to 600 MHz
- Class FA is specified up to 1000 MHz
- Class I and Class II are specified up to 2000 MHz

Significant changes from the previous edition include:
Class I and II channel and link requirements have been added

- Category 8.1 and 8.2 connecting hardware and cord requirements have been added
- Cabled OM1, OM2, and OS1 optical fibre is no longer recommended for new installations
- Cabled wideband OM4 (OM5) and OS1a optical fibre requirements have been added

This International Standard provides:
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 standardisation bodies with a cabling system which supports current products and provides a basis for future product development.

This International Standard specifies a multi-vendor cabling system which can be implemented with material from single and multiple sources, and is related to:
a) international standards for cabling components developed by committees of the IEC, for example copper cables and connectors as well as fibre optic cables and connectors (see Clause 2 and bibliography)
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 developed by technical committees of the IEC, by subcommittees of ISO/IEC JTC 1 and by study groups of IEEE 802 and ITU-T, for example for LANs and ISDN
d) planning and installation guides which take into account the needs of specific applications for the configuration and the use of cabling systems on customer premises (for example ISO/IEC 14709 series, ISO/IEC 14763 series, ISO/IEC 30129, and ISO/IEC 18598).

Physical layer requirements for the applications listed in Annex E have been analysed to determine their compatibility with the cabling classes specified in this standard. These application requirements, together with statistics concerning the topology of premises and the model described in ISO/IEC 11801-2 clause 8.2, have been used to develop the requirements for Classes A to FA and fibre optic cabling systems.

In offices horizontal balanced cabling should now be designed to provide minimum Class E, and minimum Class E_A is recommended to support applications with data rates exceeding 1 Gigabit/sec.

Scopes

Scope of ISO/IEC 11801-1: Generic cabling for customer premises – Part.1 General requirements

This International Standard specifies requirements that are common to the other parts of the ISO/IEC 11801 series. Cabling specified by this standard supports a wide range of services including voice, data, and video that may also incorporate the supply of power.
This International Standard specifies:

a) The fundamental structure and configuration of generic cabling requirements within the type 400 premises defined by the other standards in the ISO/IEC 11801 series
b) channel transmission and environmental performance requirements
c) link performance requirements
d) component performance requirements, referring to available International Standards for 404 components and test methods where appropriate
e) test procedures to verify compliance with the cabling transmission performance requirements 406 of the 11801 series documents.

Note: This International Standard does not contain specific compliance requirements. The cabling design documents supported by ISO/IEC 11801-1 incorporate the requirements of this standard as part of their individual compliance requirements.
In addition, ISO/IEC 11801-1 provides information regarding the applications supported by the cabling channels. ISO/IEC 11801-1 has taken into account requirements specified in the application standards listed in Annex E.

Scope of ISO/IEC 11801-2 – Generic cabling for customer premises – Part.2 Office premises

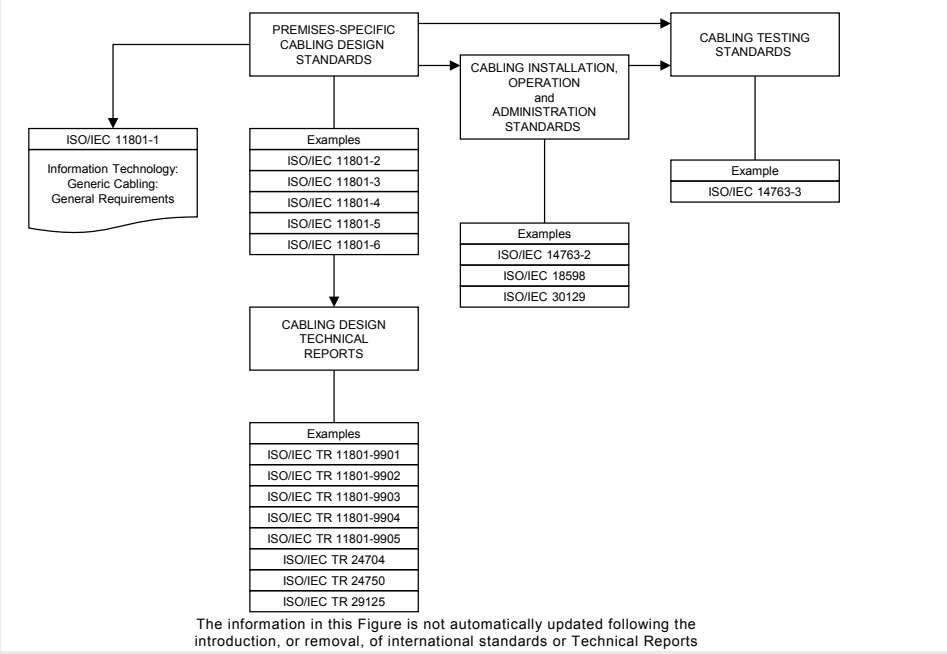
This International Standard specifies generic cabling for use within office premises, which may comprise single or multiple buildings on a campus. It covers balanced cabling and fibre optic cabling.
ISO/IEC 11801-2 is optimised for premises where the maximum distance over which telecommunications services can be distributed is 2000 m. The principles of this International Standard may be applied to larger installations.
Cabling specified by this standard supports a wide range of services including voice, data, and video that may also incorporate the supply of power.
This International Standard specifies directly or via reference to ISO/IEC 11801-1:

a) the structure and minimum configuration for generic cabling within office premises
b) the interfaces at the telecommunications outlet (TO)
c) the performance requirements for cabling links and channels
d) the implementation requirements and options
e) the performance requirements for cabling components
f) the compliance requirements and verification procedures.

ISO/IEC 11801-2 has taken account of the requirements specified in application standards listed in ISO/IEC 11801-1:201X, Annex E.

Safety (e.g. electrical safety and protection and fire) and Electromagnetic Compatibility (EMC) requirements are outside the scope of this International Standard, and are covered by other standards and by regulations. However, information given by this standard may be of assistance.

Scope of ISO/IEC 11801-6 – Generic cabling for customer premises – Part. 6 Distributed building services.



Source: ISO/IEC 11801-1 (2017)

The figure shows the schematic and contextual relationships between the standards relating to information technology cabling produced by ISO/IEC JTC 1/SC 25, namely the ISO/IEC 11801 series of standards for generic cabling design, standards for the installation, operation and administration of generic cabling and for testing of installed generic cabling.

The life expectancy of generic cabling systems can vary depending on environmental conditions, supporting applications, ageing of materials used in cables, and other factors, such as access to pathways (campus pathways are more difficult to access than building pathways). With appropriate choice of components, generic cabling systems meeting the requirements of this International Standard are expected to have a life expectancy of at least ten years.

CAT. 8 - Understanding the performance category for balanced twisted pair cables

Introduction

Ethernet is now widely deployed as a preferred networking solution for many types of application ranging from small businesses to large enterprises. Increased network traffic, driven by server virtualisation and converged networking, is driving the need for higher bandwidth server connections.
Ethernet BASE-T interfaces, using balanced twisted pair cabling, are prevalent. They are ideal for network environments with a mixed set of applications, equipment and networking port speeds. The ability to auto-negotiate between application speeds allows easy migration to higher operating speeds on an as-needed basis, while maintaining compatibility with existing equipment. This, along with its cost-effectiveness, makes balanced twisted pair cabling still a very popular medium for supporting Ethernet applications.
Category 6A performance was defined to support 10 Gigabit Ethernet (GbE) over balanced twisted pair cabling in a channel, up to 100 m. This standard was ratified in February 2008.
In 2010, the Institute of Electrical and Electronics Engineers (IEEE) ratified the 802.3ab standard defining 40 Gbps and 100 Gbps Ethernet transmission. There are many options for the physical medium dependent (PMD) sublayer that defines the transmission and reception details of the physical layer. The majority of the options are listed below. As we can see, most PMDs listed are for 40/100 Gbps transmission over fibre. There is a shielded copper cable option for both 40 and 100 GbE for up to 7 m, but the supported medium is twinax cable. There is no option for balanced twisted pair cable.

What initiated the development of Category 8?

The IEEE 802.3 NGBASE-T Call-for-Interest (CFI) led to the formation of a Study Group to investigate and possibly develop this technology. In March, 2013, IEEE approved the formation of the task group IEEE 802.3bq to develop the 40GBASE-T Ethernet Standard for supporting 40 GbE over cost-effective twisted pair cabling.

Some of the main objectives of the 802.3bq group are the following:

- Support full duplex operation only
- Preserve the 802.3 Ethernet frame format utilising the 802.3 MAC
- Preserve the minimum and maximum frame size of the current 802.3 standard
- Support a Bit Error Rate (BER) better than or equal to 10-12
- Support auto-negotiation
- Support energy-efficient Ethernet
- Support local area networks using point-to-point links over structured cabling topologies, including directly connected link segments
- Do not preclude meeting FCC and CISPR EMC requirements
- Support a data rate of 40 Gbps
- Define a link segment based upon copper media specified by ISO/IEC JTC1/SC25/WG3 and TIA TR-42.7 meeting the following characteristics: – 4-pair, balanced twisted pair copper cabling
  – Up to two connectors
  – Up to at least 30 m
- Work in TIA 42.7 was initiated in 2013 to support this new PMD for 40GBASE-T.

Summary of Physical Layer Options for Supporting 40 and 100 GbE

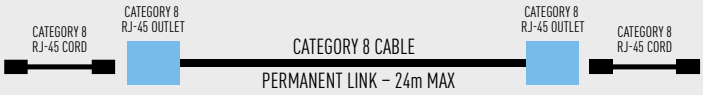
PMD/Interface	IEEE standard	Supported media
40GBASE-SR4	802.3ab	OM3 multimode fibre (d 850 nm (4-channel) up to 100 m OM4 multimode fibre (d 850 nm (4-channel) up to 150 m
40GBASE-LR4	802.3ab	Singlemode fibre (d1310 nm (CWDM) up to 10 km
40GBASE-CR4	802.3ab	Twinax cable (4-channel) up to at least 7 m
40GBASE-KR4	802.3ab	Backplane (4-channel) up to 1 m
100GBASE-SR10	802.3ab	OM3 multimode fibre (d 850 nm (10-channel) up to 100 m OM4 multimode fibre (d 850 nm (10-channel) up to 150 m
100GBASE-LR4	802.3ab	Singlemode fibre (d 1310 nm (CWDM) up to 10 km
100GBASE-ER4	802.3ab	Singlemode fibre (d 1310 nm (CWDM) up to 40 km
100GBASE-CR10	802.3ab	Twinax cable (10-channel) up to at least 7 m

IEEE announced a Call-for-Interest (CFI) for a new application, NGBASE-T in July 2012. NGBASE-T stands for Next Generation BASE-T beyond 10 Gbps. "BASE-T" signifies that the medium will be balanced twisted pair cabling

TIA Category 8 specification

The TIA 42.7 Working Group completed the Category 8 performance specification standard in June, 2016. The Category 8 channel is a 2-connector model using foiled twisted pair (FTP) cable with a maximum permanent link length of 24 m, as shown in Figure 1 below. Category 8 transmission performance is specified from 1 MHz to 2000 MHz.

Category 8 Channel



The horizontal backbone cable will consist of four balanced twisted pairs with conductors ranging from 22 AWG to 24 AWG. The cord cable consists of four balanced twisted pairs with conductors ranging from 22 AWG to 26 AWG. Category 8 is a shielded solution with no specifications for bundled or hybrid cables. Category 8 uses the RJ45, an eight-position modular jack common to BASE-T applications, supported over structured cabling systems, defined within TIA. It will also support auto-negotiation for backwards compatibility since it still uses the 4-pair balanced twisted pair cable used by other cable categories.

The length of the channel can vary from 28 m to 32 m, depending on the length of cords (patch/equipment cords) allowed. This is because the patch cord length allowed depends on a derating factor. The derating factor is based on the wire gauge size (AWG) of the conductor used in the cordage. See Table 2 for the length of cordage allowed based on the de-rating factor.

Patch Cord Derating Factor Based on a 24-Metre Permanent Link

Equipment cord derating factor	Cord length allowed (M)
0% (22/23 AWG)	8
20% (24 AWG)	6
50% (26 AWG)	4

Although this is a great departure from the traditional 100 m, 4-connector channel, Category 8 has to be backwards-compatible with existing cabling and equipment to allow auto-negotiation between 100 Mbps, 1 Gbps, 10 Gbps and 40 Gbps over balanced twisted pair cabling. The Category 8 specification is Addendum 1 of the TIA-568-C.2 standard (ANSI/TIA-568-C.2-1).

Currently, ISO has the following category and class specifications:

- **Category 5** components provide Class D balanced cabling performance (specified to 100 MHz)
- **Category 6** components provide Class E balanced cabling performance (specified to 250 MHz)
- **Category 6A** components provide Class E_A balanced cabling performance (specified to 500 MHz)
- **Category 7** (shielded) components provide Class F balanced cabling performance (specified to 600 MHz)
- **Category 7A** (shielded) components provide Class FA balanced cabling performance (specified to 1000 MHz)

TIA performance specifications do not recognise Category 7 or 7A (shielded solutions). ISO has also been working on Category 8.1 and 8.2 component specifications to support a new Class I and II channel specification respectively. The existence of these ISO performance specifications is the reason TIA chose Category 8 as the next performance specification.

The Class I specification is similar to the current TIA Category 8 specification. Originally, the ISO Class I channel and 8.1 component performance was specified only to 1.6 GHz. ISO has extended the performance specification to 2 GHz, and like the TIA has not initiated any work similar to ISO's Class II and Category 8.2 specifications which extend performance and use connectors other than RJ45.

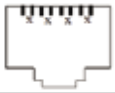
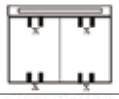
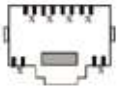
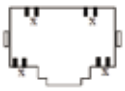
ISO/IEC Category 8 specification

ISO is the International Organisation for Standardisation. It creates standards for structured cabling similar to TIA, with participation from international organisations; the US also has a participating delegation. The ISO/IEC 11801 standard is similar to the ANSI/TIA-568 standard.

Both organisations are trying to harmonise the standards but there are some differences. For example, ISO specifies the channel performance specification as a "Class" and component performance specifications as a "Category". TIA has traditionally used "Category" to refer to the component, link and channel performance specifications.

ISO recognises several connector types for Category 8. These interfaces are shown in Table 3 below. Category 8.1/Class I uses an RJ45 interface. This is the same interface used in all TIA category specifications (TIA-568-C.2 standard), including the Category 8 specification. ISO recognises three interfaces for Category 8.2/Class II; the TERA, GG45, and ARJ45. These are also recognised Category 7A interfaces in ISO. TIA has chosen not to adopt these interfaces and not to create a second class due to lack of applications.

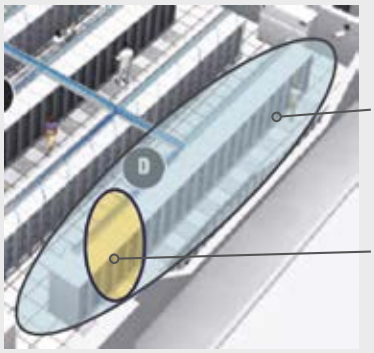
Connection Interfaces for Category 8 in ISO Standards

PDM/Interface	Supported media	Type	DWG description
Category 8.1/Class I	TIA 568-C.2 ISO/IEC 11801	RJ45	
Category 8.2/Class II	IEC 61076-3-104 (C7A Interface)	TERA1	
	IEC 60603-7-71 (C7A Interface)	GG452	
	IEC 61076-3-110 (C7A Interface)	ARJ453	

Notes: 1. TERA® is a registered trademark of The Siemon Company.
2. GG45® is a registered trademark of Nexans (France).
3. ARJ45® is a registered trademark of Bel Fuse Ltd (Hong Kong).

What is the application

Development of a Category 8 performance standard was driven by the need to support the next generation of NGBASE-T. The need for the next generation BASE-T standard was substantiated by a need to support Ethernet beyond 10GbE for server-to-switch connections. The existing 40 GbE over copper standard (ratified in 2010), 40GBASE-CR4, defines 40 Gbs over twinax cable for up to 7 m. This is sufficient for use within a rack or a neighbouring rack but not sufficient for supporting other architectures within a data centre. Therefore, the initial application driving the development of NGBASE-T and Category 8 was support for server-to-switch connections within a row, such as end-of-row or middle-of-row architectures.



Next Gen BASE-T ideal for server-to-switch connections within the row

Distance covered by NGBASE-T
Within the rack
Neighbouring racks, stranded ports
End of row

Distance covered by CR4
Within the rack
Neighbouring racks

Category 8 will allow support of 40 Gbps over balanced twisted pair cable for 28 to 32 m depending on the patch cord wire gauge (AWG) used in TIA. In ISO, the distance is fixed to 26 m permanent link and 4 m cords for a total of 30 m channel. This distance works well for use within racks, neighbouring racks, and end-of-row racks. Switch fabrics, such as leaf and spine, are growing in popularity in the data centre and may also provide an application for Category 8. Category 8 will use an RJ45 interface, which is backwards-compatible with previous TIA category standards and will support auto- negotiation, making transitions to faster data applications easy.

A document has also been produced in TIA that identifies opportunities for high-performance structured cabling (i.e. Category 8). The TIA TR-42.7 subcommittee approved a new Technical Service Bulletin, TIA TSB-5019, "High Performance Structured Cabling Use Cases for Data Centres and Other Premises" published at the April 2015 plenary meeting. This document is intended to provide details for deploying future Category 8 structured cabling in data centres and other premises to support 25GBASE-T and 40GBASE-T applications. The document identifies, analyses and recommends architectures such as switch fabric, end-of-row, middle-of-row and top-of-rack for high-performance structured cabling using next generation BASE-T standards with data rates above 10GBASE-T such as 25GBASE-T and 40GBASE-T. These examples can be used in data centre or premise designs such as test labs or equipment rooms requiring high bandwidth solutions.

What are the challenges?

One of the biggest challenges has been defining the measurement technology required to assess and verify Category 8 component, link and channel performance. The frequency range has drastically increased from 500 MHz for Cat. 6A to 2000 MHz for Cat. 8. There are several task groups working on this.

Addendum 1 to the ANSI/TIA-1183: Measurement Methods and Test Fixtures for BalunLess Measurements of Balanced Components and Systems standard was completed in January 2016. This standard is intended to be used as an independent testing reference and describes methods and fixtures that support laboratory measurement of all differential mode, mixed mode, and common mode transmission parameters up to 1 GHz. Category 8 requires the frequency range to be extended to 2 GHz.

ANSI/TIA-1152-A, the requirements for field-testing balanced twisted pair cabling, including Category 8 performance, was approved for publication at the October plenary meeting.
This standard provides requirements for field test instruments, as well as measurement methods for comparing field instrument measurements against measurements obtained using laboratory equipment. The challenge was that the frequency range to be tested had to be increased from 500 MHz (Cat. 6A) to 2000 MHz for Cat. 8.
The table lists the field tester accuracy levels. TIA published the Category 8 standard in July 2016 and ISO was published in the first quarter of **2017 IEC 61935-1**.

Field Tester Accuracy Levels

Cabling standard	Frequency range (MHz)	Accuracy level
CAT 5e	100	Level II
CAT 6	250	Level III
CAT 6_A	500	Level IIIe
CAT 8	2000	Level 2G

ISO by IEC (and IEC 61935-1)

Cabling standard	Frequency range (MHz)	Accuracy level
CLASS F	600	Level IV
CLASS FA	1000	Level V (draft)

Summary and conclusions

Will Category 8 be widely adopted? That is the question being asked by many. A twisted-pair Ethernet (BASE-T) solution has advantages such as being one of the most widely adopted structured cabling technologies, low cost, using a common connector interface and auto-negotiation capabilities. The Category 8 standard does specify the RJ45 interface, making it compatible with all other TIA balanced twisted pair cabling standards.

The Category 8 channel length has been reduced from the historical 100-metre channel length and is a shielded solution, with the channel being limited to 2 connectors. Both the 30-metre channel length (can vary from 28-32 m depending on the cords) and 2-connector channel limitations must be included in designs intended to support future BASE-T applications.

How widely will Category 8 be adopted? Will fibre be less expensive? Time will tell, however, you should keep an eye on the active equipment manufacturers because they have a huge influence on what gets adopted.

TIA published the Category 8 standard in July 2016 and ISO was published in the first quarter of 2018.

Fibre optic system - Transmission speed from 40 Gbps to 100 Gbps

IEEE and TIA ISO/IEC standards

IEEE 802.3 is a working group within the Institute of Electrical and Electronics Engineers (IEEE) professional organisation. It is also a collection of IEEE standards produced by the working group defining the physical layer and the media access control layer (MAC) of wired Ethernet. (There are other groups responsible for wireless, etc.) These standards define technology, generally specific to local area networks, with some wide area network applications. The standards define the physical connections between nodes and/or infrastructure devices like hubs, switches, routers, etc. and various types of copper or fibre optic cable.

The Telecommunications Industry Association (TIA) and the SC25 committee in ISO/IEC defines the performance for structured cabling at the component level, link level and channel level to support an application over the distance specified. Sometimes a new performance category needs to be defined to support a new application.

The purpose of standards is to provide the minimum requirements to guarantee applications will function properly with equipment from any manufacturer. Using TIA or ISO/IEC structured cabling assures interoperability between components from different manufacturers.

40/100 Gbps transmission

In 2010, the IEEE 802.3ba standard defining 40 Gbps and 100 Gbps Ethernet transmission primarily over optical fibre was ratified. This was based on the IEEE 802.3ae standard defining 10 GbE transmission ratified in 2002, which made development of the standard much easier and faster. IEEE did not develop a completely new transmission definition for 40G bps and 100 Gbps transmission over two fibres like 10 GbE. Both 40 GbE and 100 GbE were based on using parallel transmission paths transmitting 10 Gbps; 40 GbE requires four channels and 100 GbE requires ten channels for both transmission and reception. This was a departure from previous fibre optic systems.

In 2015, IEEE released a new standard, 802.3bm, which provides a new version of 100 GbE to reduce costs. This standard reduces the number of transmission channels from 10 to 4 by increasing the modulation rate from 10 Gbps to 25 Gbps in each channel. This will make it very easy to update the infrastructure from 40 GbE to 100 GbE because both use the same number of fibres for transmission.

Every application that IEEE802.3 defines has a Physical Medium Dependent (PMD) sublayer as part of the specification. The PMD sublayer defines details of transmission and reception of individual bits on a physical medium. Table 1 lists most of IEEE's 40 Gbps Ethernet PMDs, including the PMD name, type of medium and distance over which application is supported. PMD names are often used when naming transceivers.

Table 1: IEEE Objectives for 40-Gigabit Ethernet

Objective	Resulting PMD	Description of PMD
100m on OM3[1] MMF[2] (850nm)	40GBASE-SR4	40 Gbps PHY using 40GBASE-R encoding over (4) lanes of multimode fibre with a reach up to at least 100m (can support at least 150m over OM4 MMF[2]
150m on OM4[3] MMF[2] (850nm)		
10km on SMF[4] (1310nm)	40GBASE-LR4	40 Gbps PHY using 40GBASE-R encoding over (4) wavelength division multiplexing (WDM) lanes of single-mode fibre with a reach up to at least 10km
40km on SMF[4] (1310nm)	40GBASE-ER4	40 Gbps PHY using 40GBASE-R encoding over (4) wavelength division multiplexing (WDM) lanes of single-mode fibre with a reach up to at least 40km
7m over copper	40GBASE-CR4	40 Gbps PHY using 40GBASE-R encoding over (4) lanes of shielded balaced copper cabling[5] with a reach up at least 7m
1m over backplane	40GBASE-KR4	40 Gbps PHY using 40GBASE-R encoding over (4) lanes of an electrical blackplane with a reach uo to at least 1m

1. OM3 is a 50 micron, laser-optimised multimode fibre
2. MMF stands for multimode fibre
3. OM4 is a 50 micron, laser-optimised multimode fibre with higher bandwidth than OM3
4. SMF stands for singlemode fibre
5. Twinax cabling is used

The initial goals were to support 40GbE for at least 100 m over multimode fibre, up to at least 10 km over singlemode and up to 7 m over shielded balanced copper (Twinax). With the release of OM4 (a 50-micron laser-optimised multimode fibre (LOMF) with higher bandwidth than OM3) the distance can be extended to 150 m. Another PMD was added in 2015 to support 40 GbE over singlemode up to at least 40 km. There is also a PMD defined for supporting 40 GbE for at least 1 m over an electrical backplane.

Table 2 lists the objectives for supporting 100 GbE over specific media.

Objective	Resulting PMD	Description of PMD
100m on OM3 MMF[1] (850nm)	100GBASE-SR10	100 Gbps PHY using 100GBASE-R encoding over (10) lanes of multimode fibre with a reach up to at least 100m (can support at least 150m over OM4 MMF[1])
150m on OM4 MMF[1] (850nm)		
70m on OM3 MMF[1] (850nm)	100GBASE-SR4	100 Gbps PHY using 25 Gbps data rate over (4) lanes of multimode fibre with a reach up to at least 100m (can support at least 100m over OM4 MMF or 70m over OM3 MMF)
70m on OM4 MMF[1] (850nm)		
10km on SMF[2] (1310nm)	100GBASE-LR4	100 Gbps PHY using 100GBASE-R encoding over (4) wavelength division multiplexing (WDM) lanes of single-mode fibre with a reach up to at least 10km
40km on SMF[2] (1310nm)	100GBASE-ER4	100 Gbps PHY using 100GBASE-R encoding over (4) wavelength division multiplexing (WDM) lanes of single-mode fibre with a reach up to at least 10km
7m over copper	100GBASE-CR10	10 Gbps PHY using 100GBASE-R encoding over (10) lanes of shielded balanced copper cabling[3] with a reach up to at least 7m

1. MMF stands for multimode fibre
2. SMF stands for single-mode fibre
3. Twimax cabling is used

The objectives for both 40 and 100 GbE are the same; supporting the application over multimode fibre for at least 100 m, over singlemode fibre for at least 10 km and a longer option of 40 km, and over balanced copper cabling (Twinax) for up to at least 7 m. One thing to keep in mind is that 100GBASE-SR4 is supported for at least 100 m over multimode fibre when using OM4 but only 70 m over OM3.

The PMDs are summarised in table 3 for 40 GbE and table 4 for 100 GbE. The tables summarise the signalling, media and distance for both 40-Gigabit Ethernet and 100-Gigabit Ethernet.

Table 3: Signalling, Medium and Distance for 40-Gigabit Ethernet PMDs

40 Gigabit Ethernet				
PDM Name	40CBASE-SR4	40CBASE-LR4	40CBASE-ER4	40CBASE-CR4
Signalling	4x10 Gbps	4x10 Gbps	4x10 Gbps	4x10 Gbps
Media	Parallel MMF	Duplex SMF	Duplex SMF	Twimax
Distance	0.5-100m OM3/150m OM4	10km SMF	40km SMF	7m Twimax

Table 4: Signalling, Media and Distance for 100-Gigabit Ethernet PMDs

100 Gigabit Ethernet					
PDM	100CBASE-SR4	100CBASE-SR10	100CBASE-LR4	100CBASE-ER4	100CBASE-CR10
Signalling	4x25 Gbps	10x10 Gbps	4x25 Gbps	4x25 Gbps	10x10
Media	Parallel MMF	Parallel MMF	Duplex SMF	Duplex SMF	Twimax
Distance	100m OM4/70m OM3	100m OM3/150m OM4	10km SMF	40km SMF	7m Twimax

Some key takeaways are that both 40 GbE and 100 GbE require more than two fibres for transmission over multimode fibre. 40 GbE requires four transmit and four receive multimode fibres, making a total of eight fibres per channel.

The newer 100 GbE PMD, 100GBASE-SR4, uses the same cable plant (eight fibres) as 40 GbE, providing a seamless migration path. The singlemode options for 40 GbE and 100 GbE also require multichannel transmission. 40-Gigabit Ethernet over singlemode uses four transmit channels and four receive channels, each transmitting at 10 Gbps. 100-Gigabit Ethernet over singlemode uses four transmit and four receive channels, each transmitting at 25 Gbps. IEEE 802.3ba, the 40 Gbps and 100 Gbps Ethernet transmission standard, specifies signalling over singlemode fibre using wavelength division multiplexing (WDM) transmission. This means that for 40 GbE and 100 GbE over singlemode fibre, each of the four channels is transmitted at a different wavelength.

40GBASE-LR4 transmission is defined by a centre wavelength and wavelength range for each channel. The centre wavelengths used for the four channel are members of the CWDM (Conventional/Course Wavelength Division Multiplexing) grid defined in the ITU-T G.694.2 standard. This standard defines a channel spacing grid using wavelengths from 1271 to 1611 nm, with channel spacing of 20 nm. Table 5 shows the centre wavelength and wavelength range for each 40GBASE-LR4 transmission channel.

100GBASE-LR4 and 100GBASE-ER4 also define a wavelength range for each channel. The wavelength range is the same for both 100GBASE PMDs as shown in table 5. These ranges are based on centre frequencies that are part of the frequency grid defined in the ITU-T G.694.1 standard. This standard defines a set of frequencies used to designate allowed central frequencies to support dense wavelength division multiplexing (DWDM) applications. This standard supports a variety of channel spacing ranging from 12.5 GHz to 100 GHz and wider, beginning at 193.1 THz. 100GBASE-LR4 and 100GBASE-ER4 channels use centre frequencies from 229 THz to 231.4 THz and are spaced at 800 GHz.

Table 5 shows the centre frequency, correlating centre wavelength and wavelength range for each 100GBASE-LR4 and 100GBASE-ER4 channel.

Table 5: Wavelength-Division-Multiplexed Lane Assignments

	40GBASE-LR4		100GBASE-ER4		
Lane	Centre Wavelength	Wavelength Range	Centre Frequency	Centre Wavelength	Wavelength Range
L_0	1271 nm	1264.5 to 1277.5 nm	231.4 THz	1265.56 nm	1294.53 to 1296.59 nm
L_1	1291 nm	1284.5 to 1297.5 nm	230.6 THz	1300.05 nm	1299.02 to 1301.09 nm
L_2	1311 nm	1304.5 to 1317.5 nm	229.8 THz	1304.58 nm	1303.54 to 1305.63 nm
L_3	1331nm	1324.5 to 1337.5 nm	229 THz	1309.14 nm	1308.09 to 1310.19 nm

Since the different wavelengths do not interfere with each other when transmitted on a single fibre, all four can be transmitted over one fibre. If all four signal channels are transmitted at the same wavelength then four fibres are needed to separate the channels as in parallel transmission over multimode. The four receive channels also use WDM transmission so 40 GbE and 100 GbE channels over singlemode only require a total of two fibres; one transmit fibre and one receive fibre. These cables typically use LC connectors. There is no requirement to associate a particular electrical channel with a particular optical channel since the transceiver is capable of receiving channels in any order.

Both 40 GbE and 100 GbE have a copper option for up to 7 m using Twinaxial cable. 802.3ba does not define a twisted pair option.

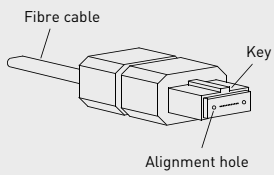
Notes: MTP® is a registered trademark of US Conec, Ltd.

40/100-Gigabit Ethernet connectivity and cable

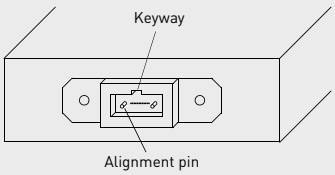
Based on the aforementioned standards, all 40/100-Gigabit Ethernet options over multimode fibre use parallel transmission, requiring more than two fibres per channel. Fibre connectivity must be able to terminate more than two fibres. This is a departure from connectivity used in systems supporting up to 10-Gigabit Ethernet, which only requires a total of two fibres per channel. The most common connector for transmission over two fibres is the LC. This is the only connector recommended for new installations requiring two fibres for transmission in the TIA data centre standard, ANSI/TIA-942 and ISO/IEC 11801 3rd Edition and especially ISO/IEC 11801-5 for data centres. This connector is used for 10 GbE and below over multimode fibre, as well as the 40/100 GbE singlemode options reviewed previously.

With the need to support multiple transmission channels, the Media Dependent Interface (MDI) identified by the IEEE 802.3ba standard for 40 GbE and 100 GbE transmission (when not using WDM) is the MPO-style connector. The MPO connector is the connector recommended by the ANSI/TIA-942 data centre standard ISO/IEC 11801 3rd Edition and especially ISO/IEC 11801-5 for data centres for applications requiring parallel fibre transmission. The terms "MPO" and "MTP®" are used interchangeably for this style of connector. MPO is the generic name for this Multi-Fibre Push On connector style. MTP is an MPO-style connector and a registered trademark of US Conec, Ltd. It is considered in the industry to be a better performing connector with lower insertion loss.

MPO Connector



MPO female plug connector flat interface



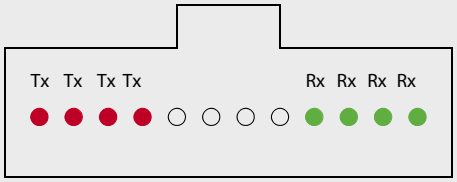
Male MDI as a PMD receptacle for mating with a female MPO plug connector.

MPO connectors are typically terminated onto 12 fibres. MPOs may also be terminated onto 24 fibres. There is a keyway for maintaining polarity. (Polarity is covered in more depth later in this paper in the section entitled, "Fibre Considerations when Migrating to 40/100-Gigabit Ethernet"). The connector has precision alignment pins or holes to ensure all fibres align properly with the mating connector. The component type (i.e. cassette, adaptor panel, trunk cable) usually dictates whether there are pins or holes; pins are usually on fixed components like cassettes. If not properly cleaned, alignment pins can collect debris around the pins, resulting in the two components not mating correctly.

IEEE 802.3ba identifies specific positions on an MPO connector to use for transmission and reception. The four transmit and four receive fibre optic channels of 40GBASE-SR4 (40 GbE over multimode) must occupy the positions shown in the figure below.

Looking at the end of the MPO, with the connector key on top, the transmit fibre optic channels occupy the four leftmost positions and the receive fibre optic channels occupy the four rightmost positions. There are eight active channels within twelve positions in total, with the four middle positions unused.

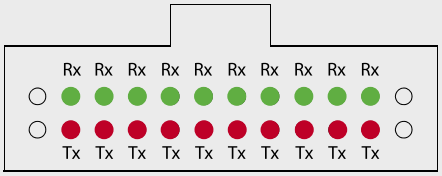
40G-BASE-SR4 Fibre Optic Channel Assignments



The 100GBASE-SR10 (100 GbE over multimode) requires a total of 20 fibres, 10 transmit and 10 receive. Position assignments are shown below. There are three options, the first being a single receptacle shown as Option A in figure below. Option A is recommended by IEEE. The two-receptacle options: Option B and Option C are alternatives.

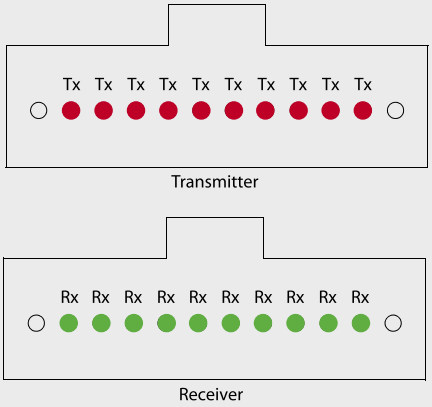
Option A uses a 24-position MPO connector with the top middle 10 positions allocated for reception and the bottom 10 middle positions allocated for transmission, as shown in the figure below.

100G-BASE-SR10 Fibre Optic Channel Assignments Option A: Single connector (recommended)



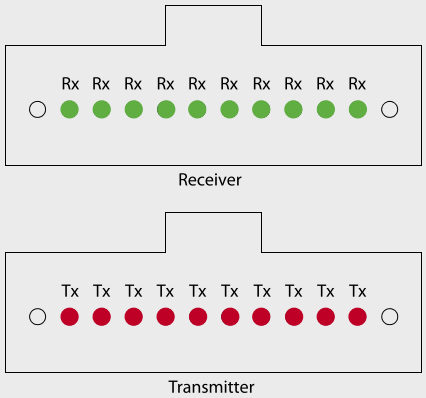
Option B and C use two 12-position MPO connectors. Option B, shown in the figure below, uses side-by-side interfaces. The 10 middle positions of the right-hand interface are used for reception and the 10 middle positions of the left-hand interface are used for transmission.

100G-BASE-SR10 Fibre Optic Channel Assignments Option B: Side by side (alternative)



Options C is similar to option B, but uses the stacked layout depicted in the figure below. The ten middle positions of the top connector are used for reception and ten middle positions of the bottom connector are used for transmission.

100G-BASE-SR10 Fibre Optic Channel Assignments Option B: Side by side (alternative)



Equipment manufacturers usually play a key role in driving the adoption of a particular MDI (Media Dependent Interface) option. For example, Option A, the single 24-position MPO has more connections in a smaller footprint, making it more complex and therefore more costly to manufacture. Option B, two 12-fibre side-by-side MPO connectors, requires twice the width of the other two options. Option C, two stacked 12-position MPO connectors, is single-width, but takes up more vertical space, where rack units could potentially be added

Fibre considerations when migrating to 40/100-Gigabit Ethernet

Introduction

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

Some common approaches used in data centres are summarised in Table 6 below. Each approach uses short-wavelength (850 nm) transmission over multimode fibre.

The fibre system should be designed around OM3 or OM4 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 550 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 40 GbE and/or 100 GbE in the future, the channel cannot be designed for the maximum distances over which 10G can be supported. If the data centre has distances exceeding 70 m it is a good idea to use OM4, since OM4 supports 10 GbE through 100 GbE for up to at least 100 m. 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 fibre, OM3 or OM4, there are several other important considerations when selecting components for a fibre optic cabling system. These include channel insertion loss, polarity and alignment pins.

Table 6: Common Data Centre Approaches Using Short Wavelength Transmission

Fibre	Data Rate (Gbps)	IEEE Standard Status	Fibre Pairs	Wavelengths
Multimode	25	Ratified	1	1
	40	Ratified	4	1
		Non-Standard	1	2
			1	4
	50	Draft	1	1
	100	Ratified	10	1
			4	1
		Non-Standard	1	4
		Draft	1	2
	400	Draft	4	2
			4	4
		Ratified	16	1
	800	Draft	4	4

Channel Insertion Loss/Loss Budget

The channel insertion loss is made up of the insertion loss (IL) of the cable, specified as decibels per kilometre (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 below, as the data rate increases from 10 Gbps to 40/100 Gbps, the total channel insertion loss or loss budget decreases noticeably.

Table 7: Maximum Channel Insertion Loss

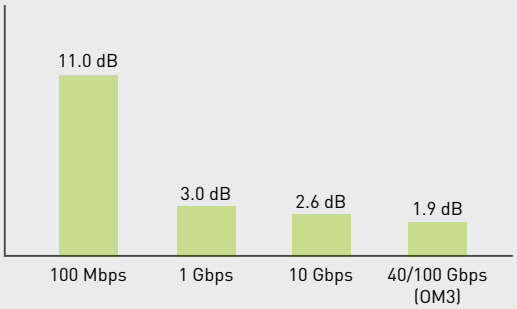
Name	Reach on OM3/4	Reach on OM4/5	Fibre Pairs	Connector	Budget OM3 @ 850nm	Budget OM4/OM5 @ 850nm
1000BASE-SX	550m	550m	1	LC*	3,6	3,6
10GBASE-SR	300m	400m	1	LC*	2,6	2,9
25GBASE-SR	70m	100m	1	LC*	1,8	1,9
40GBASE-SR4	100m	150m	4	MPO	1,9	1,5
50GBASE-SR	70m	100m	1	LC*	1,8	1,9
100GBASE-SR10	100m	150m	10	MPO	1,9	1,5
100GBASE-SR4	70m	100m	4	MPO	1,8	1,9
100GBASE-SR2	70m	100m	2	MPO	1,8	1,9
200GBASE-SR4	70m	100m	4	MPO	1,8	1,9
400GBASE-SR16	70m	100m	16	MPO	1,9	1,9

*or equivalent duplex

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.

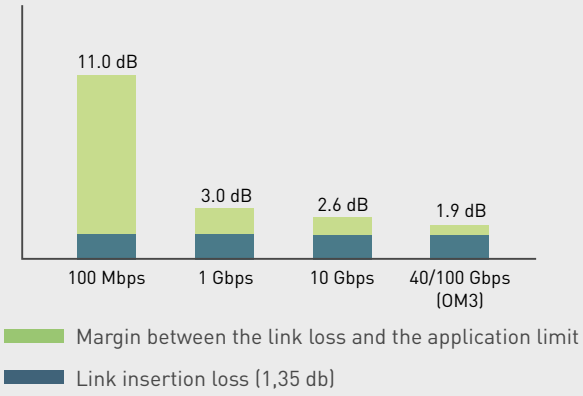
The figure below shows the total loss budgets for a 100 m channel at different data rates common to current Ethernet applications. As data rates progress from 100 Mbps Ethernet-based systems to today's 10 Gbps Ethernet-based systems, the fibre optic loss budgets have shrunk considerably from 11 dB to 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



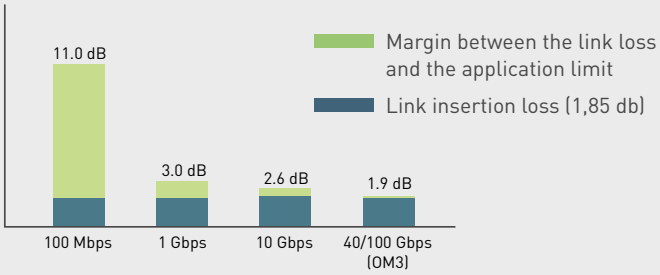
If we look at two channel insertion loss budget examples for 2 and 3 mated pairs, including the cable loss for a 100 m link at 850 nm, the importance of connector loss is apparent.
Using the standard loss for a multimode fibre cable (OM3/OM4, 850 nm) of 3 dB/km (ISO/IEC 11801 3rd Edition-Q2 2017) and an average of 0.50 dB loss per mated connector pair (TIA 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 TIA standards 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 signalling, 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:

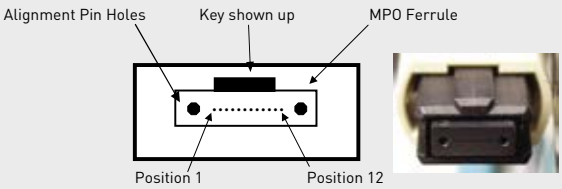
- MPO-to-MPO backbone cables: Type A, B or C
- MPO-to-LC cassettes: Method A or Method B
- Patch cords: Type A-to-A or Type A-to-B

A-to-A and A-to-B Patch Cords

For example, with duplex signalling, 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 fibre optic links integrate multiple transmitters in one transmitter module, multiple fibres in fibre 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 ANSI/TIA-568 ISO/IEC 14763-2 standard to include links that use parallel signalling in one row (24-fibre MPO). Array connectors are keyed to maintain polarity. A keyed MPO connector is shown in the figure below.

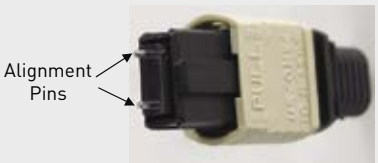
MPO Plug Fibre Positions Looking at the Ferrule End with Key Up



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.

What's coming?

IEEE has a number of ongoing projects for both copper and fibre applications. A key fibre-application project underway is for 400 GbE. The goal is to provide physical layer specifications, supporting the following link distances:

At least 100 m over MMF
At least 500 m over SMF
At least 2 km over SMF
At least 10 km over SMF

The first phase of 400 GbE over MMF uses 16 channels for transmission in both directions (total of 32 channels), each transmitting at 25 Gbps. To support this, TIA published a standard for 16- and 32-fibre MPO-style array connectors, ANSI/TIA-604-18 (FOCUS 18) at the end of 2015.

To provide a cost and performance migration path to 400 GbE, IEEE added support for two-channel 100 Gbps and four-channel 200 Gbps sometimes called NGOATH (Next Generation One and Two Hundred). Both of these are based on 50 Gbps channel rates. As a result, IEEE has also defined a single-channel 50 Gbps PHY with supported distances of at least 100 m over multimode fibre along with 2 km and 10 km options over singlemode fibre.

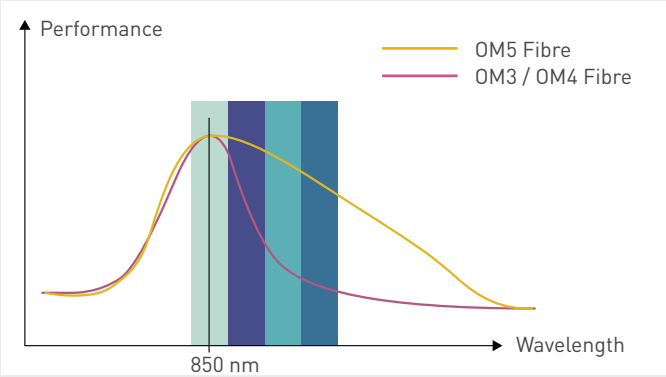
This two-channel 100 GbE is supported over multimode fibre up to at least 100 m and up to at least 500 m over singlemode fibre. 200 GbE will be supported over multimode fibre at least 100 m, also. There are several singlemode options including supporting a distance of at least 500 m using 4-channel parallel singlemode fibre (four parallel fibres), supporting a distance of at least 2 km over duplex singlemode fibre and supporting a distance of at least 10 km over duplex singlemode fibre.

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-optimised optical fibre that is optimised 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 fibre 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 fibre.

This is a significant standard for multimode fibre because it makes wavelength division multiplexing (WDM) possible over multimode fibre. Since the fibre is optimised for short wavelengths, the wavelength division multiplexing used over multimode fibre is commonly called short wavelength division multiplexing (SWDM). Up until now, WDM has only been used

with singlemode fibre. WDM is important because it is one of four ways to increase the data rate: WDM, parallel transmission with multiple fibres, increased modulation and using multi-level coding.

To show how this new standard can influence fibre 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 fibre (MMF), uses a channel rate of 10 Gbps with eight fibres; four fibres for transmission and four fibres for reception. Using WBMMF that supports four wavelengths (in effect four channels) the four transmit fibres are reduced to one fibre, as are the receive fibres. The fibre optic cable plant is reduced from eight fibres to two. 100GbE is an even better example because the original standard released in 2010 (100GBASE-SR10) required a total of 20 fibres, 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 fibre count to be reduced to a total of eight fibres; the same fibre count as 40GbE. This is an example of how increased modulation reduces the fibre count. Using SWDM with the new WBMMF will reduce the fibre optic plant to two fibres for 100 GbE using a 25 Gbps channel rate. Both 40 GbE and 100 GbE are reduced to duplex transmission. In order to allow wavelength multiplexed signals on multimode fibre, the new type which has been developed is called OM5: it has improved performance up to 950nm.



As was mentioned, Phase I of the 400GbE (IEEE 802.3bs) standard will specify transmission over multimode using parallel transmission with a channel rate of 25 Gbps. This will require a total of 32 fibres. Employing SWDM over WBMMF reduces the fibre count to 8 fibres, 25% of the number of fibres required in Phase I.

There are also many developments within Fibre Channel, a high-speed network technology primarily used to connect computer data storage. 32G Fibre Channel (GFC) was published and transceivers have been trialled since the 3rd quarter of 2016. The target link distance is 100 m over OM4 and 70 m over OM3. 32 GFC still uses serial transmission with 2 fibres and will use the same external small form factor pluggable (SFP) transceiver modules with LC fibre optic connectors. This will be backwards-compatible with 8 GFC and 16 GFC.

There is a new project looking at 128 GFC. Normally, Fibre Channel doubles in speed, 8 GFC, 16 GFC, 32 GFC, etc., but 128 GFC will be based on 32 GFC. 128 GFC will use 4 x 32 GFC. A port will be able to auto-negotiate 128 GFC back to 32 GFC and 16 GFC without user intervention.

There are ongoing discussions to combine both 64 GFC and 256 GFC. Having a SWDM MMF option, based on Wide Band MMF TIA-492AAAE, is also being considered. Requirements will include backwards compatibility with 32 GFC.

Conclusions

Before selecting a product for your data centre design, establish the fastest application your structured cabling will need to support. Multimode fibre systems are more common than singlemode systems for short distances because they are more cost-effective. Select at least OM3, however OM4 will provide longer-distance support or more connections over shorter distances. Some newer applications are supported up to 100 m only by OM4, so be aware of the application and distance requirements.

Wideband multimode fibre will have a huge influence on the fibre optic cable plant. As long as transceivers are available, two fibres can support up to 100 GbE using duplex transmission. If a transceiver can support 50 Gbps per channel using SWDM over wideband fibre, even the new 200 GbE could use duplex transmission (2 fibres in total). Wideband multimode fibre requires 25% of the total number of OM4 fibres to support applications traditionally using parallel transmission (multiple transmit and multiple receive fibres).

The type of connector is determined by the transmission; LC for duplex transmission and MPO/MTP® for parallel transmission. 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.

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 had 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 summarising 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 Euro Classes:

Euro Class	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 trade-offs 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 in most 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.

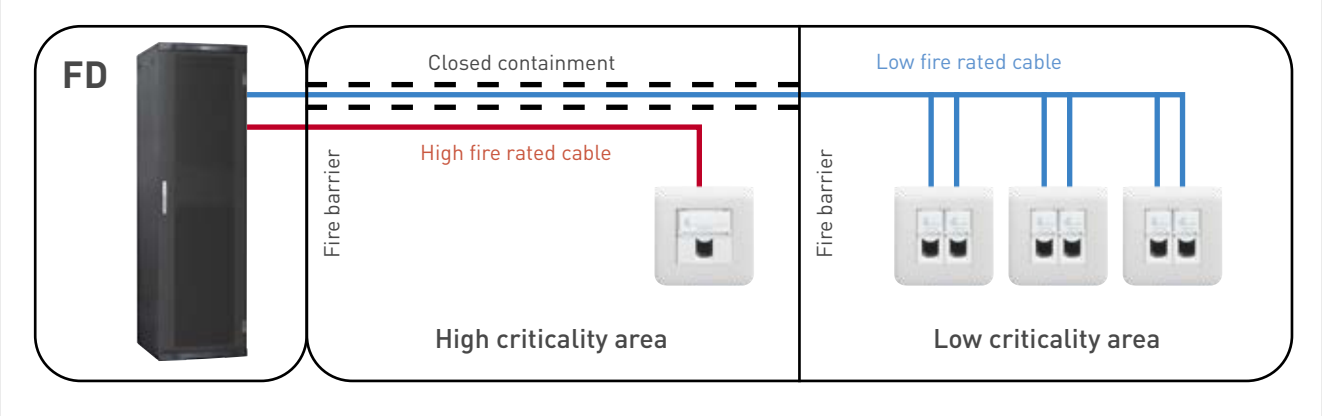
While the cables are not directly inside the user space, the particles have marginal influence on the ability for people to evacuate. These could have an impact in an open containment directly above a main exit corridor where flaming droplets could pose a threat, but in most cases, "d2" is perfectly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

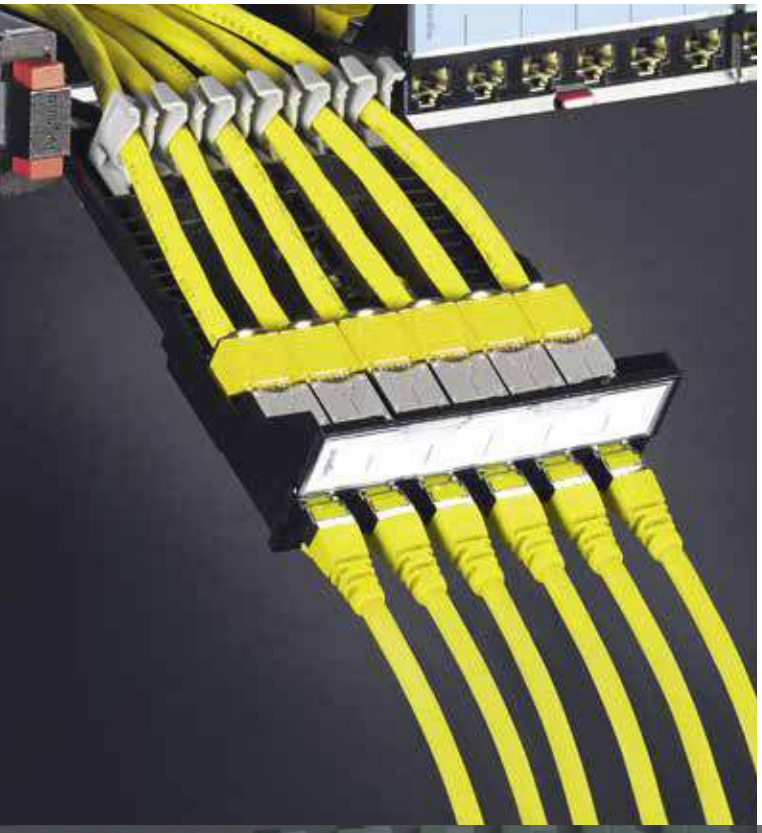
Design

The CPR is a European regulation to categorise 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 buildings 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.



LCS³ STRUCTURED CABLING

LCS³ Copper

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Connectivity and enclosure selection charts

P. 104
Cat. 6 LCS³ patch panels and connectors

LCS³ Fibre optic

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LCS³ cables and preterminated links

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LCS³ patch cords

Audio/video system

P. 123
Multiparticipant HDMI projection and MediaHub

SmartRak® 2.0

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Server cabinets and accessories

LCS³ Energy distribution

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Zero-U Basic PDUs

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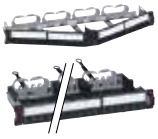
Copper LCS³ system

10" patch panels, High Density patch cords, cable extender, zone distribution box solutions, PoE switches, etc

Fibre optic LCS³ system

OM3 preterminated links, High Density pre-equipped cassettes, 8-fibre solutions, angled fibre optic drawer, Zero-U kit, etc



P. 98
Cat. 8
LCS³ patch panels
Available upon request only

P. 99
Cat. 8
LCS³ connector, cables and cords
Available upon request only

P. 100
Cat. 6A
LCS³ patch panels and connectors

P. 102
Cat. 6A
LCS³ cables, cords and RJ 45 sockets

P. 106
Cat. 6
LCS³ cables, cords and RJ 45 sockets

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Cat. 5e
LCS³ patch panels and connectors

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PoE switches, doublers, adaptors and accessories

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LCS³ 19" fibre optic drawers, blocks

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LCS³ High Density panel and cassettes

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LCS³ pigtails, case and quick-connect connectors

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HDMI and HD15 sockets, HDMI extender

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Type-C USB adaptors and cords, data cords

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1U/2U horizontal Basic PDUs

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1U Basic PDUs

P. 134
Intelligent metered and switched PDUs

P. 135
PDUs to be equipped and accessories

Audio/video system

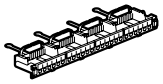
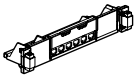
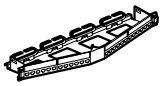
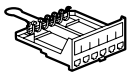
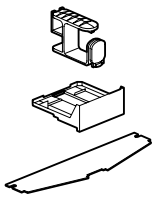
HDMI preterminated sockets, USB Data sockets, USB Data extender, etc.

LCS³ energy distribution

Switched 19" PDUs, switched Zero-U vertical PDUs

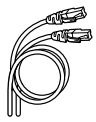
Selection chart - connectivity

configure your system

LCS³ 1U 19" FLAT PATCH PANELS			Cat. 8	Cat. 6A	Cat. 6	Cat. 5e
	1U patch panels equipped with 24 connectors	STP	Available on request	0 337 72	0 337 62	-
		UTP	-	0 337 70	0 337 60	0 337 50
		FTP	-	-	0 337 61	0 337 51
	1U patch panels to be equipped	With cassette	Available on request	0 337 90	0 337 90	0 337 90
		Without cassette	Available on request	0 337 91	0 337 91	0 337 91
	1U High Density patch panel to be equipped with 48 ports		-	0 337 93	0 337 93	0 337 93
LCS³ 1U 10" FLAT PATCH PANELS						
	1U 10"patch panels to be equipped	Up to 6 connectors	Available on request	0 337 98	0 337 98	0 337 98
		Up to 12 connectors	Available on request	0 337 99	0 337 99	0 337 99
LCS³ RJ 45 CONNECTORS AND CASSETTES TO BE EQUIPPED						
	1U angled patch panel to be equipped		Available on request	0 337 92	0 337 92	0 337 92
	1U High Density angled patch panel to be equipped		-	0 337 94	0 337 94	0 337 94
LCS³ RJ 45 CONNECTORS AND CASSETTES TO BE EQUIPPED						
	6 RJ 45 connectors for flat and angled panel	STP	Available on request	0 337 75	0 337 65	-
		UTP	-	0 337 73	0 337 63	0 337 53
		FTP	-	-	0 337 64	0 337 54
	Cassette for flat panels to be equipped		Available on request	0 337 55	0 337 55	0 337 55
	High Density cassette for flat panels to be equipped		-	0 337 95	0 337 95	0 337 95
ACCESSORIES						
	Cord guide		0 337 59			
	Blanking cassette		0 337 57			
	Port blanking modules		0 337 56			
	Cover		0 337 58			
LCS³ 1U 19" TELEPHONE PATCH PANEL						
	1 U telephone patch panel 50 ports 110 connect		0 335 79			
POE SWITCHES AND INJECTOR						
	Tablet/DIN PoE 1 Gigabit switch - non manageable	5 RJ 45 ports	0 335 08			
	Tablet/DIN PoE 10/100 Mbps switch - non manageable	5 RJ 45 ports	0 335 03			
	19" PoE 1 Gigabit switches - manageable	12 RJ 45 ports (8 PoE+ ports)	0 334 90			
		26 RJ 45 ports (24 PoE+ ports)	0 334 92			
	19" PoE 10/100 Mbps switch - non manageable	18 RJ 45 ports (16 PoE+ ports)	0 334 91			
	PoE injector	1 input/1 output	0 327 37			

Selection chart - connectivity

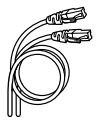
configure your system (continued)

LCS³ RJ 45 PATCH CORDS AND USER CORDS					Cat. 8	Cat. 6A	Cat. 6	Cat. 5e
	LSZH	S/FTP	100 Ω impedance	0.5 m	Available on request Available on request Available on request	0 515 50(1)	-	-
				1 m	Available on request Available on request Available on request	0 518 70 0 518 66 0 515 51(1)	-	-
				2 m	Available on request Available on request Available on request	0 518 71 0 518 67 0 515 52(1)	-	-
				3 m	Available on request Available on request Available on request	0 518 72 0 518 68 0 515 53(1)	-	-
				5 m	-	0 518 73 0 518 69 0 515 54(1)	-	-
		F/UTP	100 Ω impedance	0.5 m	-	-	0 515 40(1)	-
				1 m	-	-	0 515 41(1) 0 518 54 0 518 50	-
				2 m	-	-	0 515 42(1) 0 518 55 0 518 51	-
				3 m	-	-	0 515 43(1) 0 518 56 0 518 52	-
				5 m	-	-	0 515 44(1) 0 518 57 0 518 53	-
		U/UTP	100 Ω impedance	0.5 m	-	-	0 515 45(1)	-
				1 m	-	- 0 518 78 0 518 74	0 515 46(1) 0 518 62 0 518 58	-
				2 m	-	- 0 518 79 0 518 75	0 515 47(1) 0 518 63 0 518 59	-
				3 m	-	- 0 518 80 0 518 76	0 515 48(1) 0 518 64 0 518 60	-
				5 m	-	- 0 518 81 0 518 77	0 515 49(1) 0 518 65 0 518 61	-

1: High Density

Selection chart - connectivity

configure your system (continued)

LCS³ RJ 45 PATCH CORDS AND USER CORDS (CONTINUED)					Cat. 8	Cat. 6A	Cat. 6	Cat. 5e
	PVC	S/FTP	100 Ω impedance	0.5 m	-	0 518 16[1]	-	-
				1 m		0 517 80[1]	0 517 52[1]	
				2 m		0 517 81[1]	0 517 53[1]	
				3 m		0 517 82[1]	0 517 54[1]	
				5 m		0 517 83[1]	0 517 55[1]	
		F/UTP	100 Ω impedance	0.5 m	-	-	0 518 15	0 518 14[3]
				1 m			0 517 62	0 516 40[3]
				2 m			0 517 63	0 516 41[3]
				3 m			0 517 64	0 516 42[3]
				5 m			0 517 65	0 516 43[3]
		U/UTP	100 Ω impedance	0.5 m	-	-	0 518 18	0 518 17
				1 m		0 518 82	0 517 72	0 516 36
				2 m		0 518 83	0 517 73	0 516 37
				3 m		0 518 84	0 517 74	0 516 38
				5 m		0 518 85	0 517 75	0 516 39
COPPER CABLES (305 M OR 500 M REELS)								
	LSZH	S/FTP	4 pairs	500 m	Available on request	0 327 77[1]	-	-
			4 pairs (indoor/outdoor)	500 m	-	0 338 90	-	-
			2 x 4 pairs	500 m	-	0 327 79[1]	-	-
		SF/UTP	4 pairs	500 m	-	-	0 327 57	-
		F/UTP	4 pairs	305 m	-	-	0 328 56	0 327 52
				500 m	-	0 327 78	0 327 56	0 328 50
			2 x 4 pairs	500 m	-	0 328 78	0 327 76	-
		F/FTP	4 pairs	500 m	-	0 327 99	-	-
			2 x 4 pairs	500 m	-	0 327 98	-	-
		U/UTP	4 pairs	305 m	-	-	0 327 54	0 327 50
				500 m	-	0 327 87	0 328 61	0 328 53
		U/FTP	4 pairs	500 m	-	0 328 84	-	-
			2 x 4 pairs	500 m	-	0 328 85	-	-
	PVC	SF/UTP	4 pairs	500 m	-	-	0 327 59	-
		F/UTP	4 pairs	305 m	-	-	0 328 57	0 327 53
				500 m	-	-	0 327 58	-
		U/UTP	4 pairs	305 m	-	-	0 327 55	0 327 51

1: Cat. 7 cable

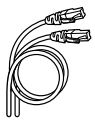
Selection chart - connectivity

configure your system (continued)

ARTEOR RANGE RJ45 SOCKETS				Cat. 6A	Cat. 6	Cat. 5e
	1 module	**STP**	○ White	5 723 06		
	1 module		● Magnesium	5 728 06		
	1 module	**UTP**	○ White			5 723 03
	1 module		● Magnesium			5 728 03
	1 module		○ White	5 723 49	5 723 02	
	1 module		● Magnesium	5 728 49	5 728 02	
	2 modules		○ White - square version		5 723 14	
	2 modules		● Magnesium - square version		5 728 14	
	2 modules		○ White			5 723 15
	2 modules		● Magnesium			5 728 15
	2 modules		○ White			5 723 30
	2 modules		● Magnesium			5 728 30

Selection chart - connectivity

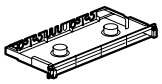
configure your system (continued)

ZONE DISTRIBUTION BOXES / CONSOLIDATION POINT							
	Zone distribution box to be equipped	12 ports			0 337 96	0 337 96	0 337 96
		24 ports			0 337 97	0 337 97	0 337 97
RJ 45 CONNECTORS FOR ZONE DISTRIBUTION BOXES							
	6 RJ 45 connectors	STP			0 337 75	0 337 65	-
		UTP			0 337 73	0 337 63	0 337 53
		FTP			-	0 337 64	0 337 54
RJ 45 CORDS FOR ZONE DISTRIBUTION BOXES							
	U/UTP	100 Ω impedance	RJ 45 - RJ 45	8 m	-	0 515 10	-
				15 m	-	0 515 11	-
				20 m	-	0 515 12	-
RJ 45 CORDS FOR ZONE DISTRIBUTION BOXES							
	S/FTP	100 Ω impedance	RJ 45 - RJ 45	8 m	0 515 23	-	-
				15 m	0 515 24	-	-
				20 m	0 515 25	-	-
	U/UTP	100 Ω impedance	RJ 45/stripped	8 m	-	-	0 517 90
				15 m	-	-	0 517 91
				20 m	-	-	0 517 92
			RJ 45 - RJ 45	8 m	-	0 515 10	0 515 00
				15 m	-	0 515 11	0 515 01
				20 m	-	0 515 12	0 515 02
	F/UTP	100 Ω impedance	RJ45/stripped	8 m	-	0 517 96	-
				15 m	-	0 517 97	-
				20 m	-	0 517 98	-
			RJ45 - RJ45	8 m	-	0 515 13	0 515 03
				15 m	-	0 515 14	0 515 04
				20 m	-	0 515 15	0 515 05
	F/UTP	100 Ω impedance	RJ 45/stripped	8 m	-	-	0 517 93
				15 m	-	-	0 517 94
				20 m	-	-	0 517 95

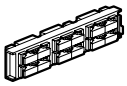
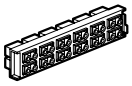
Selection chart - connectivity

configure your system (continued)

LCS³ FIBRE OPTIC DRAWERS

			Single-mode (9/125 µm)	Multimode (62.5 and 50/125 µm)
	Equipped sliding 19" fibre optic drawers	12 SC duplex (24 fibres)	0 321 64	0 321 61
		24 LC duplex (48 fibres)	0 321 65	0 321 62
		24 ST connectors	-	0 321 63
		12 SC APC duplex (24 fibres)	0 321 66	-
		24 LC APC duplex (48 fibres)	0 321 67	-
	Equipped rotating 19" fibre optic drawers	18 SC duplex (36 fibres)	0 321 74	0 321 72
		36 LC duplex (72 fibres)	0 321 73	0 321 71
	Equipped modular sliding 19" fibre optic drawers	12 SC duplex (24 fibres)	0 321 06	0 321 02
		24 LC duplex (48 fibres)	-	0 321 04
	Modular sliding 19" optic drawers to be equipped with fibre optic blocks	Empty drawer	0 321 00	
		Angled empty drawer	0 321 01	

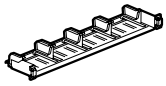
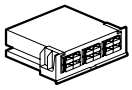
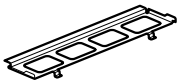
LCS³ BLOCKS AND ACCESSORIES FOR FIBRE OPTIC DRAWERS

			Single-mode (9/125 µm)	Multimode (62.5 and 50/125 µm)
	Fibre optic blocks	SC duplex blocks for 6 fibre optics	0 321 10	0 321 20
		SC duplex High Density blocks for 12 fibre optics	0 321 11	0 321 21
		SC APC duplex block for 6 fibre optics	0 321 12	-
		LC duplex blocks for 6 fibre optics	0 321 13	0 321 23
		LC duplex blocks for 12 fibre optics	0 321 14	0 321 24
		LC duplex High Density blocks for 24 fibre optics	0 321 15	0 321 25
		LC APC duplex block for 12 fibre optics	0 321 16	-
		ST blocks for 6 fibre optics	0 321 17	0 321 27
		4 MTP[1] feedthrough adaptor	0 321 33	0 321 34
	Copper block		0 321 32	
	Accessory for fan-out		0 321 28	
	Blanking module		0 321 29	
	Fibre optic pigtail cassette		0 321 30	
	Coiling kit		0 321 31	

1: MTP is a registered trademark of US Conec Ltd

Selection chart - connectivity

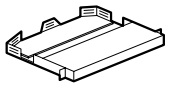
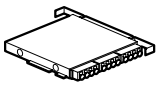
configure your system (continued)

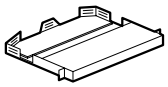
LCS³ MODULAR PANEL AND FIBRE OPTIC CASSETTES			
	19" modular panel to be equipped with cassettes		0 321 40
	Fibre optic splice cassette		0 321 41
	Copper cassette to be equipped		0 337 55
	High Density copper cassette to be equipped		0 337 95
	Preterminated MTP[1] cassettes (MPO compatible) Front and back extraction	OM4 multimode cassette (50/125 µm) 24 LC, A/C polarity	0 321 42
		OM4 multimode cassette (50/125 µm) 12 LC, A/C polarity	0 321 48
		OM4 multimode cassette (50/125 µm) 12 SC, A/C polarity	0 321 43
		OS2 single-mode cassette (9/125 µm) 24 LC, A/C polarity	0 321 44
		OS2 single-mode cassette (9/125 µm) 12 LC, A/C polarity	0 321 49
		OS2 single-mode cassette (9/125 µm) 12 SC, A/C polarity	0 321 45
	Blanking cassette		0 337 57
	Zero-U kit for universal fixing		0 321 07
	OM3 pre-equipped cassettes for multimode installation (50/125 µm) Supplied with pigtails	With 6-fibre SC block	0 321 80
		With 6-fibre LC block	0 321 81
		With 12-fibre SC block	0 321 82
		With 12-fibre LC block	0 321 83
	OS2 pre-equipped cassettes for single-mode installation (9/125 µm) Supplied with pigtails	With 6-fibre SC block	0 321 84
		With 6-fibre LC block	0 321 85
		With 12-fibre SC block	0 321 86
		With 12-fibre LC block	0 321 87
	Rear cable management accessory		0 321 46
	Cord management kit		0 321 47
	4 MTP[1] single-mode High Density adaptor		0 321 33
	4 MTP[1] multimode High Density adaptor		0 321 34

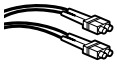
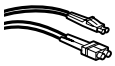
1: MTP is a registered trademark of US Conec Ltd

Selection chart - connectivity

configure your system (continued)

LCS³ ULTRA HIGH DENSITY FIBRE OPTIC DRAWERS TO BE EQUIPPED - FOR 12-FIBRE CASSETTES			
	Fibre optic drawer with front-facing cord management for 12-fibre cassettes	1 U	0 321 51
	Fibre optic drawers with front and back facing cord management for 12-fibre cassettes	1 U	0 321 50
		2 U	0 321 52
		4 U	0 321 53
	MPO 12 LC preterminated cassettes (MTP[1] compatible)	OM4 (50/125 µm)	0 321 54
		OS2 (9/125 µm)	0 321 55
	MPO adaptors (MTP[1] compatible) Ultra High Density	12-fibre multimode	0 321 56
		12-fibre single-mode	0 321 57
	Ultra High Density adaptor	12 LC multimode	0 321 58

LCS³ ULTRA HIGH DENSITY FIBRE OPTIC DRAWERS TO BE EQUIPPED - FOR 8-FIBRE CASSETTES			
	Fibre optic drawers with front and back facing cord management for 8-fibre cassettes	1 U	0 321 90
		2 U	0 321 91
		4 U	0 321 92
	MPO 8 LC preterminated cassettes (MTP[1] compatible)	OM4 (50/125 µm)	0 321 93
		OS2 (9/125 µm)	0 321 94
	MPO adaptors (MTP[1] compatible) Ultra High Density	8-fibre multimode	0 321 95
		8-fibre single-mode	0 321 96
	Ultra High Density adaptors	8 LC multimode	0 321 97
		8 LC single-mode	0 321 98
		APC 8 LC single-mode	0 321 99

LCS³ FIBRE OPTIC PATCH CORDS			OS2 single-mode	OM4 multimode	OM3 multimode	OM2 multimode
	SC/SC duplex cords	1 m	0 326 00	0 326 30	0 326 09	0 330 69
		2 m	0 326 01	0 326 31	0 326 10	0 330 70
		3 m	0 326 02	0 326 32	0 326 11	0 330 71
	SC/LC duplex cords	1 m	0 326 03	-	0 326 12	0 330 75
		2 m	0 326 04	-	0 326 13	0 330 63
		3 m	0 326 05	-	0 326 14	0 330 76
	LC/LC duplex cords	0.5 m	0 326 28	0 326 33	-	-
		1 m	0 326 06	0 326 34	0 326 15	-
		2 m	0 326 07	0 326 35	0 326 16	0 330 61
		3 m	0 326 08	0 326 36	0 326 17	-
		5 m	0 326 29	0 326 37	-	-
	LC/LC Uniboot duplex cords reversible polarity	1 m	0 326 86	0 326 95	-	-
		2 m	0 326 87	0 326 96	-	-
		3 m	0 326 88	0 326 97	-	-
		5 m	0 326 89	0 326 98	-	-
		10 m	0 326 92	0 326 99	-	-

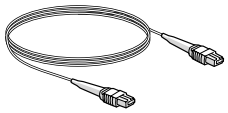
LCS³ FIBRE OPTIC CABLES (REELS)				OS2 singlemode	OM4 multimode	OM3 multimode	OM2 multimode
	Indoor/Outdoor	4 fibres	Loose	-	-	0 325 37	-
		6 fibres	Loose	0 325 12	SPEC8149	-	-
			Tight	-	0 326 65/66	-	-
		8 fibres	Loose	-	-	0 325 38	-
		12 fibres	Loose	0 325 14	-	0 325 39	0 325 06
			Tight	0 325 50	0 326 67	-	0 325 07
		24 fibres	Loose	-	SPEC8151	0 325 53	-
			Tight	-	SPEC8157	0 325 52	-

1: Length 10 metres, also available in 20, 30, 40 and 50 m lengths

2: MTP is a registered trademark of US Conec Ltd

Selection chart - connectivity

configure your system (continued)

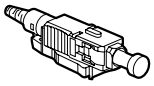
LCS³ FIBRE OPTIC PRETERMINATED SOLUTIONS - HIGH DENSITY			
	**OM3 Fan-out/Fan-out micro cables**	6 LC Duplex - 6 LC Duplex	0 324 01[1]
		12 LC Duplex - 12 LC Duplex	0 324 11[1]
	OS2 Fan-out/Fan-out micro cables	6 LC Duplex - 6 LC Duplex	0 324 21[1]
		12 LC Duplex - 12 LC Duplex	0 324 31[1]
	OM3 MTP[2]-MTP[2] micro cables	12 MTP[2]-MTP[2] fibres	0 324 41[1]
	OS1/OS2 MTP[2]-MTP[2] micro cables	12 MTP[2]-MTP[2] fibres	0 324 51[1]

LCS³ FIBRE OPTIC PRETERMINATED SOLUTIONS			12 fibres		24 fibres	
			SC/SC	LC/LC	SC/SC	LC/LC
	Tight-buffer OM3 links	10 m	1 320 01	1 320 41	1 320 21	1 320 61
		20 m	1 320 02	1 320 42	1 320 22	1 320 62
		30 m	1 320 03	1 320 43	1 320 23	1 320 63
		40 m	1 320 04	1 320 44	1 320 24	1 320 64
		50 m	1 320 05	1 320 45	1 320 25	1 320 65
		60 m	1 320 06	1 320 46	1 320 26	1 320 66
		70 m	1 320 07	1 320 47	1 320 27	1 320 67
		80 m	1 320 08	1 320 48	1 320 28	1 320 68
		90 m	1 320 09	1 320 49	1 320 29	1 320 69
		100 m	1 320 10	1 320 50	1 320 30	1 320 70
		120 m	1 320 12	1 320 52	1 320 32	1 320 72
		140 m	1 320 14	1 320 54	1 320 34	1 320 74
		160 m	1 320 16	1 320 56	1 320 36	1 320 76
		180 m	1 320 18	1 320 58	1 320 38	1 320 78
		200 m	1 320 20	1 320 60	1 320 40	1 320 80

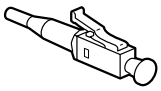
1: Length 10 metres, also available in 20, 30, 40 and 50 m lengths
2: MTP is a registered trademark of US Conec Ltd

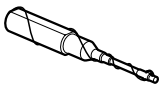
Selection chart - connectivity

configure your system (continued)

LCS³ QUICK-CONNECT CONNECTORS			
	Tool case for fibre optic quick-connect connectors		0 322 70
	OM3/OM4 quick-connect connectors	LC 50/125 µm, 900/250 µm	0 322 71
		SC 50/125 µm, 900/250 µm	0 322 72
	OS2 quick-connect connectors	LC 9/125 µm, 900/250 µm	0 322 73
		SC 9/125 µm, 900/250 µm	0 322 74
		SC APC 9/125 µm, 900/250 µm	0 322 75

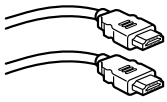
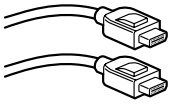
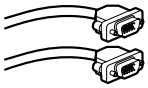
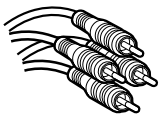
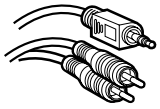
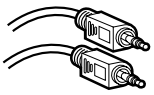
LCS³ PIGTAILS			1 m	2 m
	50/125 µm - OM2 (PC)	SC LSZH connectors	0 322 10	0 322 13
		LC LSZH connectors	0 322 11	0 322 14
		ST LSZH connectors	0 322 12	0 322 15
	50/125 µm - OM3 (PC)	SC LSZH connectors	0 322 20	0 322 23
		LC LSZH connectors	0 322 21	0 322 24
		ST LSZH connectors	0 322 22	-
	50/125 µm - OM4 (PC)	SC LSZH connectors	0 322 30	0 322 33
		LC LSZH connectors	0 322 31	0 322 34
		ST LSZH connectors	0 322 32	-
	9/125 µm - OS2 (APC or UPC)	SC-APC LSZH connectors	0 322 40	0 322 45
		SC-UPC LSZH connectors	0 322 41	0 322 46
		LC-APC LSZH connectors	0 322 42	0 322 48
		LC-UPC LSZH connectors	0 322 43	0 322 47
		ST-UPC LSZH connectors	0 322 44	0 322 49
	Kit of 12 LC pigtails	OS2 (UPC)	0 326 24	
		OM3 (PC)	0 326 26	
		OM4 (PC)	0 326 71	
	Pigtail sleeves		0 327 44	
	Fan-out units	6 fibre optics	0 330 48	
		12 fibre optics	0 330 49	

GLUE-ON CONNECTORS		
	LC connector	0 331 00

FIBRE OPTIC CLEANING ACCESSORIES		
	Ferrule cleaner MPO/MTP[1]	0 322 83
	Ferrule cleaner LC (PC/APC)	0 322 81
	Ferrule cleaner SC (PC/APC)	0 322 82
	LC replacement cartridge	0 322 84
	SC replacement cartridge	0 322 85

1: Length 10 metres, also available in 20, 30, 40 and 50 m lengths
2: MTP is a registered trademark of US Conec Ltd

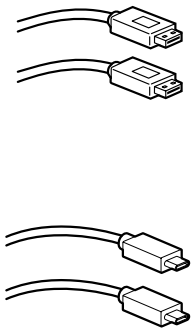
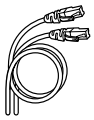
Selection chart - audio/video cables

CORDS FOR AUDIO/VIDEO AND DATA APPLICATIONS			
	High Speed HDMI cords with Ethernet	1 m	0 517 32/0 398 51[1]
		2 m	0 517 33/0 398 52[1]
		3 m	0 517 34/0 398 53[1]
		5 m	0 517 27/0 398 54[1]
		7 m	0 517 35/0 398 55[1]
	Standard HDMI cords with Ethernet	10 m	0 517 20
		15 m	0 517 36
	HDMI to micro HDMI cord	2 m	0 398 56[1]
	DisplayPort cords	2 m	0 514 00/0 398 58[1]
	HD15 male/male cords	2 m	0 517 29/0 398 50[1]
		5 m	0 517 30
		10 m	0 517 23
		15 m	0 517 31
	HD15 cord + Jack 3.5 mm	2 m	0 517 22
	RCA male/male cords	2 m	0 514 03/0 398 67[1]
		5 m	0 514 04/0 398 68[1]
	Jack 3.5 mm male to 2 RCA male Y cords	2 m	0 514 05/0 398 69[1]
		5 m	0 514 06/0 398 70[1]
	Jack 3.5 mm male/male cords	2 m	0 514 07/0 398 71[1]
		5 m	0 514 08/0 398 72[1]
	TOSLINK optical digital cable	2 m	0 398 73[1]
	XLR cord	10 m	0 517 24

1: Supplied in a plastic bag with hook

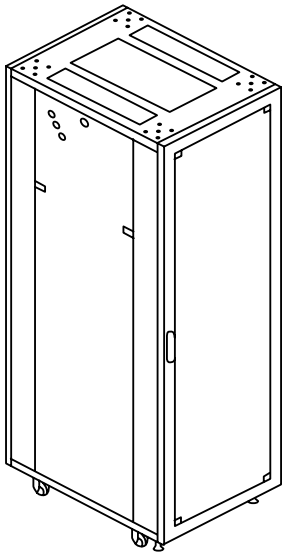
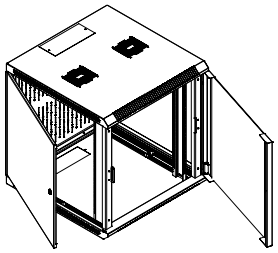
Arteor audio/video sockets
p. 90-91

Selection chart - audio/video cords and cables

CORDS FOR AUDIO/VIDEO AND DATA APPLICATIONS (CONTINUED)				
	USB data cords	USB 3.0 A male / A male cords	2 m	0 514 01/0 398 59[1]
		USB 3.0 A male / B male cords	2 m	0 514 02/0 398 60[1]
		USB 2.0 A male / Micro B male cord	1 m	0 398 61[1]
		USB 3.0 A male / Lightning male cord	1 m	0 398 62[1]
		USB 3.1 male Type-C / male Type-C cords	1 m	0 514 10/0 398 63[1]
		USB 2.0 male Type-C / male USB-A cords	2 m	0 514 11/0 398 64[1]
		USB 2.0 male Type-C / USB male Micro B cord	1 m	0 398 65[1]
	Adaptors	USB 3.1 male Type-C / HDMI female		0 514 12/0 398 66[1]
		USB male Type-C / RJ 45 female		0 514 13[1]
RJ45 CORDS				
	Cat. 6 U/UTP		2 m	0 398 74[1]
			5 m	0 398 75[1]
			10 m	0 398 76[1]
			15 m	0 398 77[1]
			20 m	0 398 78[1]
			30 m	0 398 79[1]
CABLES FOR AUDIO/VIDEO APPLICATIONS				
	VGA cable		20 m	0 327 81
	Loudspeaker cable		15 m	0 514 09

1: Supplied in a plastic bag with hook

Selection chart - enclosures

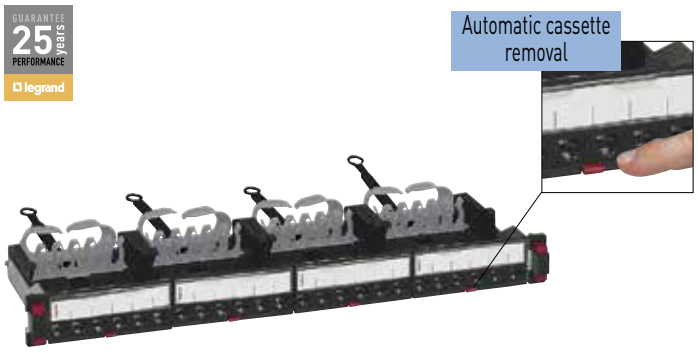
SMARTRAK 2.0 - STAND ALONE RACK	Capacity	Width	Depth 1000 (mm)	Depth 1100 (mm)	Depth 1200 (mm)
	27U	600	SR27610BVA	-	-
	27U	600	-	SR27611BVA	-
	27U	800		-	SR27812BVA
	42U	600	SR42610BVA	-	-
	42U	600	-	SR42611BVA	
	42U	800	SR42810BVA	-	-
	42U	800	-	SR42811BVA	-
	42U	800	-	-	SR42812BVA
	45U	600	SR45610BVA	-	-
	45U	600	-	SR45611BVA	-
	45U	800	SR45810BVA	-	-
	45U	800	-	SR45811BVA	-
	45U	800			SR45812BVA
	47U	600	SR47610BVA	-	-
	47U	800	SR47810BVA	-	-
	47U	800	-	-	SR47812BVA
EZRAK - PIVOTED SWING FRAME WALL MOUNT CABINET	**Capacity**	**Width**	**Depth 600 (mm)**		
	6U	600	WB600-6U-Pivot		
	9U	600	WB600-9U-Pivot		
	12U	600	WB600-12U-Pivot		
	15U	600	WB600-15U-Pivot		
	18U	600	WB600-18U-Pivot		
	24U	600	WB600-24U-Pivot		

Selection chart - Power Distribution Units

INTELLIGENT METERED POWER DISTRIBUTION UNITS (PDUS)						
	IEC 60320 standard	12 sockets (C13)	Aluminium 1U 19”	3.7 kW	3 m cord	6 460 10
		16 sockets (12 C13 + 4 C19)	Aluminium 2U 19”	7.4 kW	3 m cord	6 460 11
		22 sockets (18 C13 + 4 C19)	Aluminium Zero-U	3.7 kW	3 m cord	6 460 12
		24 sockets (20 C13 + 4 C19)	Aluminium Zero-U	7.4 kW	3 m cord	6 460 16
		42 sockets (36 C13 + 6 C19)	Aluminium HD Zero-U	7.4 kW	3 m cord	6 460 13
				11 kW	3 m cord	6 460 14
		48 sockets (36 C13 + 12 C19)	Aluminium HD Zero-U	22 kW	3 m cord	6 460 15
INTELLIGENT METERED AND SWITCHED POWER DISTRIBUTION UNITS (PDUS)						
	IEC 60320 standard	8 sockets (C13)	Aluminium 1U 19”	3.7 kW	3 m cord	6 460 20
		16 sockets (C13)	Aluminium 2U 19”	7.4 kW	3 m cord	6 460 21
		24 sockets (21 C13 + 3 C19)	Aluminium Zero-U	3.7 kW	3 m cord	6 460 22
				7.4 kW	3 m cord	6 460 23
				11 kW	3 m cord	6 460 24
		16 sockets (C13)	Aluminium zero-U	2.3 kW	3 m cord	6 460 25
BASIC POWER DISTRIBUTION UNITS (PDUS)						
	IEC 60320 standard	6 sockets (C19)	Aluminium 1U 19”	3.7 kW	Cordless	6 468 07
		10 sockets (C13)	Aluminium 1U 19”	3.7 kW	Cordless	6 468 44
		12 sockets (C13)	Aluminium 1U 19”	3.7 kW	3 m cord	6 468 15
		24 sockets (C13)	Aluminium Zero-U	7.4 kW	3 m cord	6 468 57
					Cordless	6 468 56
		8 sockets (6 C13 + 2 C19)	Aluminium 1U 19”	3.7 kW	3 m cord	6 468 09
		24 sockets (20 C13 + 4 C19)	Aluminium Zero-U	7.4 kW	3 m cord	6 468 61
					Cordless	6 468 60
		24 sockets (18 C13 + 6 C19)	Aluminium Zero-U	11 kW	3 m cord	6 468 70

Legrand cabling system, LCS³ cat. 8

flat patch panels - equipped and to be equipped



0 337 82

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

Pack	Cat. No.	
1	Available on request	**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** STP panel - Metal shielding - PoE++
		Patch panels 24-connector - to be equipped 19" panels - 1U Equipped with rear cable guide to hold cables during maintenance
1	Available on request	**Flat panel with empty cassettes to be equipped with connectors** With 4 automatically removable cassettes to be equipped with Cat. 5e to Cat. 8 RJ 45 connectors
1	Available on request	**Flat panel without connectors 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 - fibre optic

Legrand cabling system, LCS³ cat. 8

angled patch panel to be equipped with connectors

0 337 92

Pack	Cat. No.	**Angled 24-connector patch panel**
1	Available on request	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** Can take up to 24 Cat. 5e to Cat. 8 RJ 45 connectors

Legrand cabling system, LCS³ cat. 8

connector, cords and cables

0 337 85

0 337 88

0 337 03

Pack	Cat. No.	
		Cat. 8 RJ 45 connector for flat or angled STP panel
1	Available on request	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
		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 new CPR regulation
		S/FTP - 4 pairs
500[1]	Available on request	Length 500 m, supplied on a drum Weight 45 kg
		Cat. 8 RJ45 patch cords
	LSZH RAL 6027	RJ 45/RJ 45 - straight Compliant with ISO/CEI 11801 and EIA/TIA 568 standards
		Shielded S/FTP, impedance 100 Ω
1	Available on request	Length 0.5 m
1	Available on request	Length 1 m
1	Available on request	Length 2 m
1	Available on request	Length 3 m
	LSZH RAL 3020 | RAL 6026	
1	Available on request	Length 0.5 m
1	Available on request	Length 1 m
1	Available on request	Length 2 m
1	Available on request	Length 3 m
		Cat. 8 RJ 45 "direct-attach" cords
	LSZH RAL 6027	RJ 45/RJ 45 - straight
		Shielded S/FTP, impedance 100 Ω
1	Available on request	Length 5 m
1	Available on request	Length 8 m
1	Available on request	Length 10 m
	LSZH RAL 3020 | RAL 6026	
1	Available on request	Length 5 m
1	Available on request	Length 8 m
1	Available on request	Length 10 m
		Marking kit
1	Available on request	Kit of 200 coloured rings for marking RJ 45 cords Rings to be clipped onto the patch cords

1: in metre(s)

Legrand cabling system, LCS³ cat. 8

accessories

0 337 56

0 337 59

0 337 55

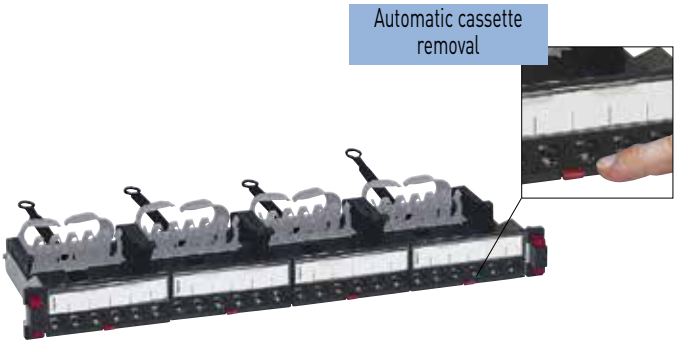
0 337 57

0 337 58

Pack	Cat. No.	
		Common accessories for flat and angled panels
		Port blanking modules
10	Available on request	Separable blanking plate For covering 1 to 6 ports or 1 to 12 ports individually (High Density solutions)
		Cord management
1	Available on request	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
1	Available on request	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
		Blanking cassette
1	Available on request	To be used to fill gaps in the panel
		Specific accessory for angled panels
		Cover
1	Available on request	Optimises air flow management in the enclosure

Legrand cabling system, LCS³ cat. 6A

flat patch panels - equipped



0 337 72

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

Pack	Cat. No.	**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++
1	0 337 70	UTP
1	0 337 72	STP

Legrand cabling system, LCS³ cat. 6A

flat patch panels, to be equipped

0 337 90

0 337 98

0 337 99

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

Pack	Cat. No.	**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
1	0 337 90	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
1	0 337 91	Takes a maximum of 4 automatically removable cassettes: - copper to be equipped with Cat. 5e to Cat. 8 RJ 45 connectors - fibre optic
		High Density flat panel with empty cassettes to be equipped with connectors
1	0 337 93	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
1	0 337 98	Takes up to 6 Cat. 5e to Cat. 8 RJ 45 connectors
1	0 337 99	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

0 337 92

0 337 94

0 337 75

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

Pack	Cat. No.	Angled patch panels - to be equipped
		19" panels - 1U
		Angled patch panel to be equipped with connectors
1	0 337 92	Takes up to 24 Cat. 5e to Cat. 8 RJ 45 connectors
		High Density angled panel to be equipped with connectors
1	0 337 94	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
1	0 337 73	UTP
1	0 337 75	STP

Legrand cabling system, LCS³ cat. 6A

accessories

0 337 56

0 337 59

0 337 55

0 337 57

0 337 58

Pack	Cat. No.	Common accessories for flat and angled panels
		Port blanking modules
10	0 337 56	Separable blanking plate For covering 1 to 6 ports or 1 to 12 ports individually (High Density solutions)
		Cord management
1	0 337 59	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
1	0 337 55	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
		High Density cassette for flat panels to be equipped
1	0 337 95	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
1	0 337 57	To be used to fill gaps in the panel
		Specific accessory for angled panels
		Cover
1	0 337 58	Optimises air flow management in the enclosure

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

cables and cords

0 327 77

0 517 82

Pack	Cat. No.	Cat. 6A cables for local networks
		Performance 500 MHz 4 pairs or 2x4 twisted pair cables, 100 Ω Yellow RAL 1018 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 new CPR regulation (except Cat. No 0 327 87)
	LSZH	
		U/UTP - 4 pairs
500¹	0 327 87	Length 500 m. Supplied on reel. Weight 35 kg
		F/UTP - 4 pairs
500¹	0 327 78	Length 500 m. Supplied on reel. Weight 29.2 kg Euroclass Dca
500¹	0 327 78G	Length 500 m. Supplied on reel. Weight 58 kg Euroclass Dca - Grey
		F/UTP - 2 x 4 pairs
500¹	0 328 78	Length 500 m. Supplied on reel. Weight 58 kg Euroclass Dca
		F/FTP - 4 pairs
500¹	0 328 83	Length 500 m. Supplied on reel. Weight 76 kg Euroclass Cca
500¹	0 327 99	Length 500 m. Supplied on reel. Weight 26 kg Euroclass Dca
		F/FTP - 2 x 4 pairs
500¹	0 327 98	Length 500 m. Supplied on reel. Weight 62 kg Euroclass Dca
		U/FTP - 4 pairs
500¹	0 328 84	Length 500 m. Supplied on reel. Weight 39 kg Euroclass Cca
		U/FTP - 2 x 4 pairs
500¹	0 328 85	Length 500 m. Supplied on reel. Weight 54 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 new CPR regulation
	LSZH	
		S/FTP - 4 pairs
500¹	0 328 82	Length 500 m. Supplied on reel. Weight 45 kg Euroclass B2 ca
500¹	0 327 77	Length 500 m. Supplied on reel. Weight 33 kg Euroclass Dca
		S/FTP - 2 x 4 pairs
500¹	0 327 79	Length 500 m. Supplied on reel. Weight 58 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 new CPR regulation
	LSZH	
		S/FTP - 4 pairs - indoor/outdoor
500¹	0 338 90	Length 500 m. Supplied on reel. Weight 45 kg Euroclass Eca

1: in metre(s)

Pack	Cat. No.	Cat. 6A RJ 45 patch cords and user cords
		RJ 45/RJ 45 - straight 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
1	0 518 82	Length 1 m
1	0 518 83	Length 2 m
1	0 518 84	Length 3 m
1	0 518 85	Length 5 m
	LSZH	
1	0 518 78	Length 1 m
1	0 518 79	Length 2 m
1	0 518 80	Length 3 m
1	0 518 81	Length 5 m
1	0 518 74	Length 1 m
1	0 518 75	Length 2 m
1	0 518 76	Length 3 m
1	0 518 77	Length 5 m
	PVC	
		Shielded S/FTP, impedance 100 Ω
1	0 517 80	Length 1 m
1	0 517 81	Length 2 m
1	0 517 82	Length 3 m
1	0 517 83	Length 5 m
1	0 518 16	Length 0.5 m
	LSZH	
1	0 518 70	Length 1 m
1	0 518 71	Length 2 m
1	0 518 72	Length 3 m
1	0 518 73	Length 5 m
1	0 518 66	Length 1 m
1	0 518 67	Length 2 m
1	0 518 68	Length 3 m
1	0 518 69	Length 5 m

		Cat. 6A RJ 45 patch cords and user cords - High Density
		RJ 45/RJ 45 - straight 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
1	0 515 50	Length 0.5 m
1	0 515 51	Length 1 m
1	0 515 52	Length 2 m
1	0 515 53	Length 3 m
1	0 515 54	Length 5 m

Legrand cabling system, LCS³ cat. 6A

RJ 45 - Arteor, Excel Life and other connectors

6 327 79

0 337 49

5 723 06

5 723 50

5 728 49

Pack	Cat. No.	Cat. 6A Keystone RJ 45 connectors
10	0 331 54	STP connector - metal shielding with quick toolless connection
10	0 331 55	UTP connector - with quick toolless connection
		Surface mounting box - 1 or 2 ports
1	6 327 79	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
1	0 337 43	To be used to extend a cable quickly & easily
		STP Cat. 6A field plug
1	0 337 49	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
		Cat. 6A Excel life keystone connectors
1	EMRJ45CAT6AWE	White
1	EMRJ45CAT6ABL	Black
		Cat. 6A Excel life keystone adaptors
1	EMKEYSTONELWE	○ Type L - Suits Legrand LCS tooless jacks. White
1	EMKEYSTONELBL	● Type L - Suits Legrand LCS tooless jacks. Black
1	EMKEYSTONELUG	● Type L - Suits Legrand LCS tooless jacks. Urban Grey

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. 6A RJ 45 sockets - Arteor
		Metal shielding
		STP - 1 module
10	5 723 06	○ White
10	5 728 06	● Magnesium
10	5 723 51	○ White with orange shutter
10	5 728 51	● Magnesium with orange shutter
10	5 723 52	○ White with green shutter
10	5 728 52	● Magnesium with green shutter
		STP with controlled access - 2 modules
		Supplied with 2 keys for 5 sockets
5	5 723 50	○ White with red shutter
5	5 728 50	● Magnesium with red shutter
		UTP - 1 module
10	5 723 49	○ White
10	5 728 49	● Magnesium
10	5 723 59	○ White with green shutter
10	5 728 59	● Magnesium with green shutter
10	5 723 58	○ White with orange shutter
10	5 728 58	● Magnesium with orange shutter
		UTP with controlled access - 2 modules
		Supplied with 2 keys for 5 sockets
5	5 723 57	○ White with red shutter
5	5 728 57	● Magnesium with red shutter

Legrand cabling system, LCS³ cat. 6A

zone distribution box solution

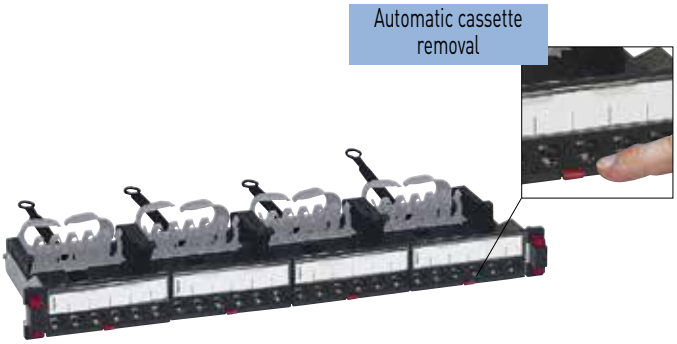
0 337 97

0 337 75

Pack	Cat. No.	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 a 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
1	0 337 96	12 ports to be equipped
1	0 337 97	24 ports to be equipped
		Cat. 6A High Density RJ 45 connectors
		Set of 6 RJ 45 connectors
1	0 337 73	UTP
1	0 337 75	STP
		Cat. 6A 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 Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards
	RAL 1018	**Shielded S/FTP, impedance 100 Ω**
1	0 515 23	Length 8 m
1	0 515 24	Length 15 m
1	0 515 25	Length 20 m

Legrand cabling system, LCS³ cat. 6

flat patch panels - equipped



0 337 61

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

Pack	Cat. No.	**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++
1	0 337 60	UTP
1	0 337 61	FTP
1	0 337 62	STP

Legrand cabling system, LCS³ cat. 6

flat patch panels, to be equipped

0 337 90

0 337 93

0 337 98

0 337 99

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

Pack	Cat. No.	**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
1	0 337 90	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
1	0 337 91	Takes a maximum of 4 automatically removable cassettes: - copper to be equipped with Cat. 5e to Cat. 8 RJ 45 connectors - fibre optic
		High Density flat panel with empty cassettes to be equipped with connectors
1	0 337 93	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
1	0 337 98	Takes up to 6 Cat. 5e to Cat. 8 RJ 45 connectors
1	0 337 99	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

0 337 92

0 337 94

0 337 63

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

Pack	Cat. No.	Angled patch panels - to be equipped
		19" panels - 1U
1	0 337 92	**Angled patch panel to be equipped with connectors** Takes up to 24 Cat. 5e to Cat. 8 RJ 45 connectors
1	0 337 94	**High Density angled panel to be equipped with connectors** Takes up to 48 Cat. 5e to Cat. 6A RJ 45 connectors

Pack	Cat. No.	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
1	0 337 63	UTP
1	0 337 64	FTP
1	0 337 65	STP

Legrand cabling system, LCS³ cat. 6

accessories

0 337 56

0 337 59

0 337 55

0 337 57

0 337 58

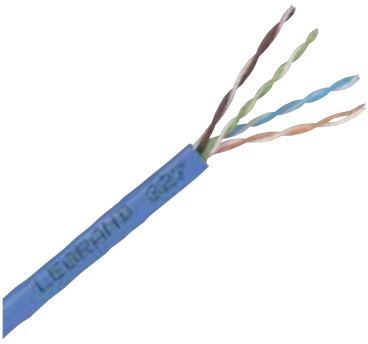
Pack	Cat. No.	Common accessories for flat and angled panels
10	0 337 56	**Port blanking modules** Separable blanking plate For covering 1 to 6 ports or 1 to 12 ports individually (High Density solutions)
1	0 337 59	**Cord management** 2 cable guides to be clipped onto new-generation Quick-Fix Provide side cord management Label-holder for identification

Pack	Cat. No.	Specific accessories for flat panels
1	0 337 55	**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
1	0 337 95	**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
1	0 337 57	**Blanking cassette** To be used to fill gaps in the panel

Pack	Cat. No.	Specific accessory for angled panels
1	0 337 58	**Cover** Optimises air flow management in the enclosure

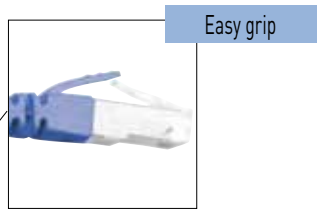
Legrand cabling system, LCS³ cat. 6

cables and cords



0 327 54

0 517 54



0 515 41

Cat. 6 cables for local networks

Performance 250 MHz
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 new CPR regulations
Euroclass Dca for LSZH cables (except Cat No 0 328 86: Euroclass Cca), Euroclass Eca for PVC cables

Pack	Cat. No. LSZH	Cat. No. PVC	
			U/UTP - 4 pairs
305[1]	0 327 54		Length 305 m Supplied in cardboard box. Weight 14 kg
305[1]	0 328 86		Length 305 m Supplied in cardboard box. Weight 17 kg
500[1]	0 328 61		Length 500 m Supplied on reel. Weight 19 kg
305[1]		0 327 55	Length 305 m Supplied in cardboard box. Weight 13 kg
			F/UTP - 4 pairs
305[1]	0 328 56		Length 305 m Supplied in cardboard box. Weight 15 kg
500[1]	0 327 56		Length 500 m Supplied on reel. Weight 27 kg
			F/UTP - 4 pairs
305[1]		0 328 57	Length 305 m Supplied in cardboard box. Weight 17 kg
500[1]		0 327 58	Length 500 m Supplied on reel. Weight 25 kg
			F/UTP - 2 x 4 pairs
500[1]	0 327 76		Length 500 m Supplied on reel. Weight 51 kg
			SF/UTP - 4 pairs
500[1]	0 327 57		Length 500 m Supplied on reel. Weight 33 kg
500[1]		0 327 59	Length 500 m Supplied on reel. Weight 30 kg

1: in metre(s)

Cat. 6 External cable

Pack	Cat. No. PE	
500	0 328 29	**U/UTP - 4 pairs** Length 500 m Supplied on reel Gel filled PE jacket

Cat. 6 RJ 45 patch cords and user cords

RJ 45/RJ 45 - straight
Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards

Pack	Cat. No. PVC RAL 5015		
			Shielded S/FTP, impedance 100 Ω
1	0 517 52		Length 1 m
1	0 517 53		Length 2 m
1	0 517 54		Length 3 m
1	0 517 55		Length 5 m
			Screened F/UTP, impedance 100 Ω
1	0 518 15		Length 0.5 m
1	0 517 62		Length 1 m
1	0 517 63		Length 2 m
1	0 517 64		Length 3 m
1	0 517 65		Length 5 m
	LSZH RAL 3020	LSZH RAL 6026	
1	0 518 54	0 518 50	Length 1 m
1	0 518 55	0 518 51	Length 2 m
1	0 518 56	0 518 52	Length 3 m
1	0 518 57	0 518 53	Length 5 m
	PVC RAL 5015		**Unscreened U/UTP, impedance 100 Ω**
1	0 518 18		Length 0.5 m
1	0 517 72		Length 1 m
1	0 517 73		Length 2 m
1	0 517 74		Length 3 m
1	0 517 75		Length 5 m
1	0 515 11		Length 15 m
1	0 515 12		Length 20 m
	LSZH RAL 3020	LSZH RAL 6026	
5	0 518 62	0 518 58	Length 1 m
5	0 518 63	0 518 59	Length 2 m
5	0 518 64	0 518 60	Length 3 m
5	0 518 65	0 518 61	Length 5 m

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

RJ 45/RJ 45 - straight
Compliant with ISO/IEC 11 801, EN 50173 and ANSI/TIA 568 standards

Pack	Cat. No. LSZH RAL 5015	
		Screened F/UTP, impedance 100 Ω
1	0 515 40	Length 0.5 m
1	0 515 41	Length 1 m
1	0 515 42	Length 2 m
1	0 515 43	Length 3 m
1	0 515 44	Length 5 m
		Unscreened U/UTP impedance 100 Ω
1	0 515 45	Length 0.5 m
1	0 515 46	Length 1 m
1	0 515 47	Length 2 m
1	0 515 48	Length 3 m
1	0 515 49	Length 5 m

Legrand cabling system, LCS³ cat. 6

RJ 45 sockets and other connectors - Arteor Soliroc, Plexo and Excel Life

5 728 02

5 728 16

5723 14

0 331 81

0 695 69

6 327 79

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

Pack	Cat. No.	Keystone RJ 45 socket cat. 6
10	0 331 81	UTP socket with fast connection - black
10	0 331 61	UTP socket with fast connection - white
30	6 327 05	UTP socket type 110 - white

Cat. 6 Soliroc RJ 45 socket - IK 10

Pack	Cat. No.
1	0 778 91

FTP - 2 modules

IP 20 - IK 10
For at-risk areas or areas without surveillance

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

RJ 45 sockets

Protection against water, dust
For industrial sites
● Grey

Pack	Cat. No.	
5	0 695 69	FTP socket
1	0 695 61	UTP socket

Adaptor for RJ 45 socket

Pack	Cat. No.
1	0 695 81

RJ 45 to be ordered separately
Guaranteed weatherproof seal (IP 44) with the plug inserted
● Grey

Cat. 6 Plexo 66 RJ 45 socket - IP 66 - IK 08

Pack	Cat. No.
1	0 904 67

FTP socket

9 contacts
Guaranteed weatherproof seal (IP 66) with the plug inserted
Inclined 90°
● Grey RAL 7016/T029

Surface mounting box - 1 or 2 ports

Pack	Cat. No.
1	6 327 79

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

Cable extenders

To be used to extend a cable quickly & easily

Pack	Cat. No.	
1	0 337 48	For FTP Cat. 6 cables
1	0 337 42	For UTP Cat. 6 cables

Cat. 6 Excel Life keystone adaptors

Pack	Cat. No.
1	EMKEYSTONEAWE
1	EMKEYSTONEABL
	EMKEYSTONEAUG

Type A - Suits Clipsal, Leviton, Hubbel, Krone, and R&M keystone jacks

○ White
● Black
● Urban Grey

Pack	Cat. No.
1	EMKEYSTONELWE
1	EMKEYSTONELBL
1	EMKEYSTONELUG

Cat. 6 Excel Life keystone adaptors

Type L - Suits Legrand LCS tooless jacks.

○ White
● Black
● Urban Grey

Cat. 6 Excel Life keystone connectors

Pack	Cat. No.	
1	EMRJ45C6WE	White
1	EMRJ45C6BL	Black

Cat. 6 RJ 45 sockets - Arteor

Mechanisms supplied with square rocker plates, to be equipped with support frames and plates

UTP - 1 module

Pack	Cat. No.	
10	5 723 02	○ White
10	5 728 02	● Magnesium
10	5 723 54	○ White with orange shutter
10	5 728 54	● Magnesium with orange shutter
10	5 723 55	○ White with green shutter
10	5 728 55	● Magnesium with green shutter

UTP - 2 modules

Pack	Cat. No.	
10	5 723 14	○ White - square version
10	5 728 14	● Magnesium - square version

UTP with controlled access - 2 modules

Supplied with 2 keys for 5 sockets

Pack	Cat. No.	
5	5 723 53	○ White with red shutter
5	5 728 53	● Magnesium with red shutter

UTP with retractable cord - 4 modules

With integrated retractable cord (0.9 m)
Automatically winds back in at the press of a button

Pack	Cat. No.	
1	5 723 39	○ White
1	5 728 39	● Magnesium

FTP - 1 module

Pack	Cat. No.	
10	5 723 22	○ White
10	5 728 22	● Magnesium

FTP - 2 modules

Pack	Cat. No.	
10	5 723 16	○ White
10	5 728 16	● Magnesium

Shielded STP - 1 module

Pack	Cat. No.	
10	5 723 23	○ White
10	5 728 23	● Magnesium

Shielded STP - 2 modules

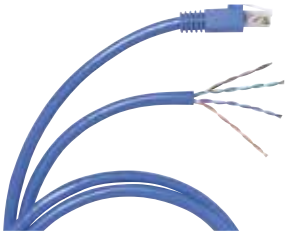
Pack	Cat. No.	
10	5 723 17	○ White
10	5 728 17	● Magnesium

Legrand cabling system, LCS³ cat. 6

zone distribution box solution

0 337 97

0 337 63



0 517 57

Pack	Cat. No.	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 a 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
1	0 337 96	12 ports to be equipped
1	0 337 97	24 ports to be equipped

		Cat. 6 High Density RJ 45 connectors
		Set of 6 RJ 45 connectors
1	0 337 63	UTP
1	0 337 64	FTP
1	0 337 65	STP

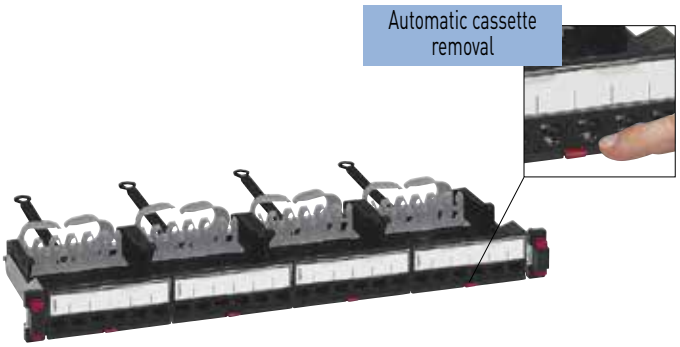
		Cat. 6 cords - RJ 45/stripped
		RJ 45/stripped - straight Plug in and out of the zone distribution boxes and connect to RJ 45 socket via the stripped side Cables prepared in factory, "ready for wiring" Compliant with ISO/IEC 11801 Ed. 2.0 (2011), EN 50173-1 and EIA/TIA 568 C2 standards
	RAL 5015	**Screened F/UTP, impedance 100 Ω**
1	0 517 96	Length 8 m
1	0 517 97	Length 15 m
1	0 517 98	Length 20 m
		Unscreened U/UTP, impedance 100 Ω
1	0 517 57	Length 8 m
1	0 517 58	Length 15 m
1	0 517 59	Length 20 m

Pack	Cat. No.	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
	RAL 5015	**Screened F/UTP, impedance 100 Ω**
1	0 515 13	Length 8 m
1	0 515 14	Length 15 m
1	0 515 15	Length 20 m
		Unscreened U/UTP, impedance 100 Ω
1	0 515 10	Length 8 m
1	0 515 11	Length 15 m
1	0 515 12	Length 20 m

		Cat. 6 sockets with copper feedthrough
		Cat. 6 UTP - Arteor
10	5 723 31	○ White
10	5 728 31	● Magnesium
		Cat. 6 FTP - Arteor
10	5 723 33	○ White
10	5 728 33	● Magnesium

Legrand cabling system, LCS³ cat. 5e

flat patch panels - equipped



0 337 51

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

Pack	Cat. No.	**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++
1	0 337 50	UTP
1	0 337 51	FTP

Legrand cabling system, LCS³ cat. 5e

flat patch panels, to be equipped

0 337 90

0 337 93

0 337 98

0 337 99

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

Pack	Cat. No.	**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
1	0 337 90	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
1	0 337 91	Takes a maximum of 4 automatically removable cassettes: - copper to be equipped with Cat. 5e to Cat. 8 RJ 45 connectors - fibre optic
		High Density flat panel with empty cassettes to be equipped with connectors
1	0 337 93	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
1	0 337 98	Takes up to 6 Cat. 5e to Cat. 8 RJ 45 connectors
1	0 337 99	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

0 337 92

0 337 94

0 337 53

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

Pack	Cat. No.	Angled patch panels - to be equipped
		19" panels - 1U
		Angled patch panel to be equipped with connectors
1	0 337 92	Takes up to 24 Cat. 5e to Cat. 8 RJ 45 connectors
		High Density angled panel to be equipped with connectors
1	0 337 94	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
1	0 337 53	UTP
1	0 337 54	FTP

Legrand cabling system, LCS³ cat. 5e

accessories

0 337 56

0 337 59

0 337 55

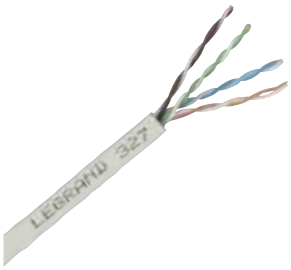
0 337 57

0 337 58

Pack	Cat. No.	Common accessories for flat and angled panels
		Port blanking modules
10	0 337 56	Separable blanking plate For covering 1 to 6 ports or 1 to 12 ports individually (High Density solutions)
		Cord management
1	0 337 59	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
1	0 337 55	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
		High Density cassette for flat panels to be equipped
1	0 337 95	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
1	0 337 57	To be used to fill gaps in the panel
		Specific accessory for angled panels
		Cover
1	0 337 58	Optimises air flow management in the enclosure

Legrand cabling system, LCS³ cat. 5e

cables



0 327 51

Pack	Cat. No. LSZH	Cat. No. PVC	Cat. 5e cables for local networks
			Performance 100 MHz 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 new CPR regulations Euroclass Dca for LSZH cables, Euroclass Eca for PVC cables
			U/UTP - 4 pairs
500[1]	0 328 53		Length 500 m Supplied on reel. Weight 30 kg
305[1]		0 327 51	Length 305 m Supplied in cardboard box. Weight 9 kg
			F/UTP - 4 pairs
305[1]	0 327 52		Length 305 m Supplied in cardboard box. Weight 11.6 kg
500[1]	0 328 50		Length 500 m Supplied on reel. Weight 26 kg
305[1]		0 327 53	Length 305 m Supplied in cardboard box. Weight 11 kg

1: in metre(s)

Legrand cabling system, LCS³ cat. 5e

cords

Pack	Cat. No. PVC	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
		Unscreened U/UTP, impedance 100 Ω
1	0 518 17	Length 0.5 m
1	0 516 36	Length 1 m
1	0 516 37	Length 2 m
1	0 516 38	Length 3 m
1	0 516 39	Length 5 m
		Unscreened U/UTP, impedance 100 Ω
1	0 518 14	Length 0.5 m
1	0 516 40	Length 1 m
1	0 516 41	Length 2 m
1	0 516 42	Length 3 m
1	0 516 43	Length 5 m

1: in metre(s)

Legrand cabling system, LCS³ cat. 5e

RJ 45 sockets (Arteor, Soliroc and Plexo) and other connectors

5 723 04

6 327 79

EMKEYSTONEAWE

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

Pack	Cat. No.	Cat. 5e Excel life keystone adaptors
1	EMKEYSTONEAWE	○ Type A - Suits Clipsal, Leviton, Hubbell, Krone and R&M keystone jacks. White
1	EMKEYSTONEABL	● Type A - Suits Clipsal, Leviton, Hubbell, Krone and R&M keystone jacks. Black
1	EMKEYSTONEAUG	● Type A - Suits Clipsal, Leviton, Hubbel, Krone, and R&M keystone jacks, Urban Grey
1	EMKEYSTONELWE	○ Type L - Suits Legrand LCS tooless jacks. White
1	EMKEYSTONELBL	● Type L - Suits Legrand LCS tooless jacks. Black
1	EMKEYSTONELUG	● Type L - Suits Legrand LCS² tooless jacks. Urban Grey

		Cat. 5e Excel Life keystone connectors
1	EMRJ45C5EWE	White
1	EMRJ45C5EBL	Black

		Keystone RJ 45 socket cat. 5e
10	0 331 60	UTP socket with fast connection - white
10	0 331 80	UTP socket with fast connection - black
10	6 327 03	UTP socket type 110 - white

Cat. 5e RJ 45 sockets - Arteor

Mechanisms supplied with square rocker plates, to be equipped with support frames and plates

UTP - 1 module

10	5 723 03	○ White
10	5 728 03	● Aluminium

UTP - 2 modules

10	5 723 15	○ White
10	5 728 15	● Aluminium

FTP - 1 module

10	5 723 04	○ White
10	5 728 04	● Aluminium

Cat. 5e Plexo RJ 45 sockets - IP 55 closed flap IK 07

Adaptor for RJ 45 socket

1	0 695 81	RJ 45 to be ordered separately. Guaranteed weatherproof seal (IP 44) with plug inserted ● Grey

		Surface mounting box - 1 or 2 ports
1	6 327 79	For Keystone connectors For surface mounting installations Can be fixed to a table or used in conjunction with mini-trunking

Legrand cabling system, LCS³ Cat. 5e

zone distribution box solution

0 337 97

0 337 53

Pack	Cat. No.	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 a 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
1	0 337 96	12 ports to be equipped
1	0 337 97	24 ports to be equipped

		Cat. 5e High Density RJ 45 connectors
		Set of 6 RJ 45 connectors
1	0 337 53	UTP
1	0 337 54	FTP

Cat. 5e cords - RJ 45/stripped

RJ 45/stripped - straight
Plug in and out of the zone distribution boxes and connect to 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 7035

Screened F/UTP, impedance 100 Ω

1	0 517 93	Length 8 m
1	0 517 94	Length 15 m
1	0 517 95	Length 20 m

Unscreened U/UTP, impedance 100 Ω

1	0 517 90	Length 8 m
1	0 517 91	Length 15 m
1	0 517 92	Length 20 m

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

RAL 7035

Screened F/UTP, impedance 100 Ω

1	0 515 03	Length 8 m
1	0 515 04	Length 15 m
1	0 515 05	Length 20 m

Unscreened U/UTP, impedance 100 Ω

1	0 515 00	Length 8 m
1	0 515 01	Length 15 m
1	0 515 02	Length 20 m

Cat. 5e sockets with copper feedthrough

Cat. 5e UTP - Arteor

10	5 723 30	○ White
10	5 728 30	● Magnesium

Cat. 5e UTP - Arteor

10	5 723 32	○ White
10	5 728 32	● Magnesium

Legrand cabling system, LCS³

PoE switches and injectors

0 334 91

0 335 08

0 327 37

Pack	Cat. No.	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
1	0 334 90	Ethernet switch with 12 RJ 45 ports (8 PoE+ ports) 1 Gigabit - Manageable
1	0 334 91	Ethernet switch with 18 RJ 45 ports (16 PoE+ ports) 10/100 Mbps - Non manageable
1	0 334 92	Ethernet switch with 26 RJ 45 ports (24 PoE+ ports) 1 Gigabit - Manageable
		Tablet/DIN switches With CCTV management option Non-manageable Supplied with DIN rail fixing accessory Dimensions: 135 x 27 x 86 mm
1	0 335 08	Ethernet switch with 4 PoE ports 1 Gigabit
1	0 335 03	Ethernet switch with 4 PoE ports 10/100 Mbps
		Midspan PoE injector
1	0 327 37	For supplying Power over Ethernet (PoE) to peripherals such as Wi-Fi access of points, IP cameras, etc Compliant with IEEE 802.3af standard Power 30 W 1 Gigabit input/1 output Direct connection to the patch panel
		Flush-mounting 10/100 base T switches
		For networking computer peripherals: computers, printers, servers, etc Possibility of extending an existing network by simply replacing an RJ 45 socket Toolless connection Compliant with IEEE 802.3 (Ethernet) and EN 500 81/82-2 (EMC requirements) standards Can be installed in any support with minimum 40 mm depth 6 ports on front + 1 side RJ 45 connector for cabling and carrying out link tests Port status display integrated in the RJ 45 connectors Labelling of each port from 1 to 6 and marker-holder for switch identification 6 modules
		Non-manageable 230 V power supply - Mosaic
1	0 779 00	◯ White
		Non-manageable PoE power supply (802.3 af Mosaic
1	0 779 01	◯ White Use a PoE injector
		Non-manageable 230 V power supply - Arteor
1	5 720 83	◯ White

Legrand cabling system

doublers and weatherproof adaptors

0 765 35

0 327 47

0 539 49

Pack	Cat. No.	RJ 45 doubler sockets
		Provide increased security against theft and damage to double connectors Provide a speed of 100 Mbps Multi-directional cable entry Can be installed in any support with minimum 35 mm depth 1 module
		Arteor
10	5 723 36	Telephone/Ethernet - FTP - 9 contacts ◯ White
10	5 728 36	Telephone/Ethernet - FTP - 9 contacts ● Magnesium
10	5 723 35	Telephone/Ethernet - UTP - 8 contacts ◯ White
10	5 728 35	Telephone/Ethernet - UTP - 8 contacts ● Magnesium
		Mobile doublers
		Clip into RJ 45 sockets to double up applications
10	0 327 83	TV/computer network or telephone doubler
10	0 327 47	Telephone/telephone doubler
10	0 327 45	Computer network/telephone doubler
10	0 327 46	L1/L2 telephone doubler
10	0 327 48	Computer network/computer network doubler
		Water resistant 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	
10	0 695 80	Adaptor with smoked flap
1	0 695 79	Adaptor with smoked flap lockable by means of a special tool
1	0 695 81	Adaptor for RJ socket ensuring IP 44 sealing of the cable when already connected
1	0 919 45	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
1	0 778 80	Adaptor with flap
1	0 778 81	Adaptor without flap
		Hypra adaptor
5	0 539 49	IP 55 adaptor base

Legrand cabling system, LCS³

sockets, panel and cables for telephone application

5 723 13

0 335 79

Pack	Cat. No.	
		Telephone sockets
		RJ 11 and RJ 12 sockets Equipped with a modular Jack connector with 1/4-turn terminal for fast connection Tap-off possible
		Arteor
10	5 723 00	○ White - RJ 11, 4 contacts, 1 module
10		● Aluminium - RJ 11, 4 contacts, 1 module
10	5 728 00	● Magnesium - RJ 11, 4 contacts, 1 module
10	5 723 13	○ White - RJ 11 - 4 contacts, 2 modules
10	5 728 13	● Magnesium - RJ 11 - 4 contacts, 2 modules
10	5 723 12	○ White - RJ 12 - 6 contacts, 2 modules
10	5 728 12	● Magnesium - RJ 12 - 6 contacts, 2 modules
		Telephone patch panel - 50 ports 110 connect
1	0 335 79	19" panel - 1U
		Cables for telephone networks
		Cables - Cat. 3. Colour: white TIA/EIA colour code
	LSZH	**U/UTP - 50 pairs**
1	0 328 91	Length 500 m Supplied on reel
		U/UTP - 100 pairs
1	0 328 88	Length 500 m Supplied on reel

Legrand cabling system, LCS³

accessories

0 517 09

0 327 60

Pack	Cat. No.	
		110 tool
1	0 332 60	110 tool
5	0 332 61	Replacement blade
		Crimping tool for RJ 45 plugs
1	0 517 09	For crimping RJ plugs with 4/6/8/9 contacts Ratchet control of crimping mechanism Possibility to cut and strip cables Tool with 3 crimping points High resistance steel material
		RJ plugs for round cables - for crimping
		Gold-coated contacts, 1.2 µm
		RJ 11
50	0 517 01	4 contacts, width 9.65 mm
		RJ 12
50	0 517 02	6 contacts, width 9.65 mm
		RJ 45 Cat. 5e
50	0 517 03	8 contacts, width 11.70 mm
50	0 517 04	9 contacts, width 11.70 mm
		RJ 45 sleeves
50	0 517 06	Black
50	0 517 07	White
		Cable protection accessories
		Plastic material IP 66/67 guaranteed when paired with Cat. No 0 533 02 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
3	0 533 00	Integrated cable gland with sealing ring and clamping blades Toolless assembly Can protect RJ 45 cords
		Flush-mounting base
3	0 533 01	Locking base Supplied with Cat. 5e female/female RJ 45 coupler
		Kit
3	0 533 02	Flush-mounting base + plug
		Protective flap
3	0 533 03	Fits on base Cat. No. 0 533 01
		Stripping tools
		Slit the sheath and release the conductors by rotation For twisted pair cables Don't damage the conductors
		Stripper
1	0 332 62	For twisted pair and fibre optic cables
		Cutting pliers
1	0 327 60	Cut wires cleanly without damaging the copper
		Blanking plates
10	0 517 40	Set of 12 blanking plugs for RJ 45 connectors White

Legrand cabling system, LCS³ fibre optic

cables

0 325 30

SPEC8512

0 325 33

Technical characteristics see e-catalogue

Colour code: FOTAG
Compliance with the EN 50173-2 and ISO IEC 11801 standards
Tight structure: "easy strip"
Other configurations on request

OS 2 single-mode fibre optic cables (9/125 µm) - (OS1 compatible)

For single-mode installations 9/125 µm, type OS 2
Yellow or black sheaths for outdoor, rodent guard...

Pack	Cat.Nos Loose tube	Cat.Nos Tight structure 900 µm	
1000		032534	Cable 12f OS2 t-buffer UV lszh in/out s-mode yellow (1000m)
1000		032535	Cable 24f OS2 t-buffer UV lszh in/out s-mode yellow (1000m)
1000		032533	Cable 6f OS2 t-buffer UV lszh in/out s-mode yellow (1000m)
2000	032514		Cable fibre OS1 12f l-tube int/out s-mode yellow (2000m)
2000	032512		Cable fibre OS1 6f l-tube inn/out s-mode yellow (2000m)
1000	032539		Cable 6f OS2 loose tube pe/ny s-mode blue (1000m)
1000	032541		Cable 24f OS2 loose tube pe/ny s-mode blue(1000m)
1000	032540		Cable 12f OS2 loose tube pe/ny s-mode blue(1000m)
2000		032550	Cable fibre OS1 12f t-buffer inn/out s-mode yellow (2000m)

OM 3 multimode fibre optic cables (50/125 µm)

"Bend insensitive"
For multimode installations 50/125 µm, type OM 3
Aqua sheaths
Suitable for 10 Giga Ethernet networks

Pack	Cat.Nos Loose tube	Cat.Nos Tight structure 900 µm	
1000	032537		Cable 12f OM3 loose tube pe/ny m-mode blue (1000m)
1000	032538		Cable 24f OM3 loose tube pe/ny m-mode blue (1000m)
2000		032552	Cable fibre OM3 24f t-buffer inn/out m-mode aqua (2000m)
1000		032531	Cable 12f OM3 t-buffer UV LSZH in/out m-mode aqua (1000m)
1000		032532	Cable 24f OM3 t-buffer UV LSZH in/out m-mode aqua (1000m)
1000	032536		Cable 6f OM3 loose tube pe/ny m-mode blue (1000m)
1000		032530	Cable 6f OM3 t-buffer UV LSZH in/out m-mode aqua (1000m)

OM 4 multimode fibre optic cables (50/125 µm)

For multimode installations 50/125 µm, type OM 4

Pack	Cat.Nos Loose tube	Cat.Nos Tight structure 900 µm	
			●
1000	SPEC8149		6 fibres - 1000 m - PE/NY Blue
1000	SPEC8150		12 fibres - 1000 m - PE/NY Blue
1000	SPEC8151		24 fibres - 1000 m - PE/NY Blue
			●
1000		SPEC8152	LSZH 6 fibres - 1000 m - Black
1000		SPEC8153	LSZH 12 fibres - 1000 m - Black
1000		SPEC8154	LSZH 24 fibres - 1000 m - Black
			●
1000		0 326 66	LSZH 6 fibres - 1000 m - Blue
1000		0 326 67	LSZH 12 fibres - 1000 m - Blue
1000		SPEC8157	LSZH 24 fibres - 1000 m - Blue

Legrand cabling system, LCS³ fibre optic

preterminated links

1 320 41

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 fibre optic drawers and splice cassettes. OM3 aqua LSZH sheaths. Supplied with test reports
Possible to obtain customised preterminated links: cable type, structure, length, connector type, etc

Pack	Cat. No.	SC/SC tight-buffer OM3 links
		6 SC simplex - 6 SC simplex
1	1 320 01	Length 10 m
1	1 320 02	Length 20 m
1	1 320 03	Length 30 m
1	1 320 04	Length 40 m
1	1 320 05	Length 50 m
1	1 320 06	Length 60 m
1	1 320 07	Length 70 m
1	1 320 08	Length 80 m
1	1 320 09	Length 90 m
1	1 320 10	Length 100 m
1	1 320 12	Length 120 m
1	1 320 14	Length 140 m
1	1 320 16	Length 160 m
1	1 320 18	Length 180 m
1	1 320 20	Length 200 m
		12 SC simplex - 12 SC simplex
1	1 320 21	Length 10 m
1	1 320 22	Length 20 m
1	1 320 23	Length 30 m
1	1 320 24	Length 40 m
1	1 320 25	Length 50 m
1	1 320 26	Length 60 m
1	1 320 27	Length 70 m
1	1 320 28	Length 80 m
1	1 320 29	Length 90 m
1	1 320 30	Length 100 m
1	1 320 32	Length 120 m
1	1 320 34	Length 140 m
1	1 320 36	Length 160 m
1	1 320 38	Length 180 m
1	1 320 40	Length 200 m

		LC/LC tight-buffer OM3 links
		6 LC simplex - 6 LC simplex
1	1 320 41	Length 10 m
1	1 320 42	Length 20 m
1	1 320 43	Length 30 m
1	1 320 44	Length 40 m
1	1 320 45	Length 50 m
1	1 320 46	Length 60 m
1	1 320 47	Length 70 m
1	1 320 48	Length 80 m
1	1 320 49	Length 90 m
1	1 320 50	Length 100 m
1	1 320 52	Length 120 m
1	1 320 54	Length 140 m
1	1 320 56	Length 160 m
1	1 320 58	Length 180 m
1	1 320 60	Length 200 m
		12 LC simplex - 12 LC simplex
1	1 320 61	Length 10 m
1	1 320 62	Length 20 m
1	1 320 63	Length 30 m
1	1 320 64	Length 40 m
1	1 320 65	Length 50 m
1	1 320 66	Length 60 m
1	1 320 67	Length 70 m
1	1 320 68	Length 80 m
1	1 320 69	Length 90 m
1	1 320 70	Length 100 m
1	1 320 72	Length 120 m
1	1 320 74	Length 140 m
1	1 320 76	Length 160 m
1	1 320 78	Length 180 m
1	1 320 80	Length 200 m

Legrand cabling system, LCS³ fibre optic

High Density preterminated links

0 324 41

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

Pack	Cat. No.	Fan-out/Fan-out preterminated High Density fibre 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 Links to be laid on cable management system	
		Fan-out/Fan-out OM3 micro cables	
		Description	Length (m)
1	0 324 01	6 LC Duplex - 6 LC Duplex	10
1	0 324 02	6 LC Duplex - 6 LC Duplex	20
1	0 324 03	6 LC Duplex - 6 LC Duplex	30
1	0 324 04	6 LC Duplex - 6 LC Duplex	40
1	0 324 05	6 LC Duplex - 6 LC Duplex	50
1	0 324 11	12 LC Duplex - 12 LC Duplex	10
1	0 324 12	12 LC Duplex - 12 LC Duplex	20
1	0 324 13	12 LC Duplex - 12 LC Duplex	30
1	0 324 14	12 LC Duplex - 12 LC Duplex	40
1	0 324 15	12 LC Duplex - 12 LC Duplex	50
		Fan-out/Fan-out OS2 micro cables	
		Description	Length (m)
1	0 324 21	6 LC Duplex - 6 LC Duplex	10
1	0 324 22	6 LC Duplex - 6 LC Duplex	20
1	0 324 23	6 LC Duplex - 6 LC Duplex	30
1	0 324 24	6 LC Duplex - 6 LC Duplex	40
1	0 324 25	6 LC Duplex - 6 LC Duplex	50
1	0 324 31	12 LC Duplex - 12 LC Duplex	10
1	0 324 32	12 LC Duplex - 12 LC Duplex	20
1	0 324 33	12 LC Duplex - 12 LC Duplex	30
1	0 324 34	12 LC Duplex - 12 LC Duplex	40
1	0 324 35	12 LC Duplex - 12 LC Duplex	50

		MTP[1]/MTP[1] High Density preterminated fibre optic links	
		For connecting cassettes in High Density fibre optic panels and Ultra High Density drawers Female MTP[1], A polarity Low insertion loss for MTP[1] connector < 0.35 dB/ connector Links to be laid on to cable management system	
		MTP[1] OM3 micro cables	
		Description	Length (m)
1	0 324 41	12 MTP[1]-MTP[1] fibre optics	10
1	0 324 42	12 MTP[1]-MTP[1] fibre optics	20
1	0 324 43	12 MTP[1]-MTP[1] fibre optics	30
1	0 324 44	12 MTP[1]-MTP[1] fibre optics	40
1	0 324 45	12 MTP[1]-MTP[1] fibre optics	50
		MTP[1] OS2 micro cables	
		Description	Length (m)
1	0 324 51	12 MTP[1]-MTP[1] fibre optics	10
1	0 324 52	12 MTP[1]-MTP[1] fibre optics	20
1	0 324 53	12 MTP[1]-MTP[1] fibre optics	30
1	0 324 54	12 MTP[1]-MTP[1] fibre optics	40
1	0 324 55	12 MTP[1]-MTP[1] fibre optics	50

1: MTP is a registered trademark of US Conec Ltd

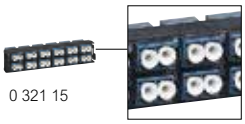
Legrand cabling system, fibre optic LCS³

19" fibre optic drawers

0 321 65

0 321 72

0 321 00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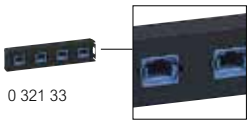
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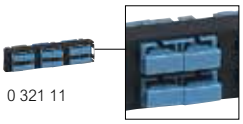
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Pack	Cat. No.	Equipped 19" fibre optic drawers
		Metal 19" pre-equipped fibre optic drawers, 4 cable entries, supplied with screw fixing kit, 2 cable glands (Ø 13.5 and 16 mm), coiling system and splice cassette Panel and optical ports marked on dedicated marking area
		Sliding End stop at a 30° angle Maximum capacity: 48 fibres in LC and ST versions, 24 in SC version Depth 220 mm, height 1U
1	0 321 61	SC duplex for 24 multimode fibres
1	0 321 62	LC duplex for 48 multimode fibres
1	0 321 63	ST duplex for 48 multimode fibres
1	0 321 64	SC duplex for 24 single-mode fibres
1	0 321 65	LC duplex for 48 single-mode fibres
1	0 321 66	SC APC duplex for 24 single-mode fibres
1	0 321 67	LC APC duplex for 48 single-mode fibres
		Rotating Supplied with reversible left or right opening Maximum capacity: 72 fibres in LC version or 36 in SC version Depth 260 mm, height 1U
1	0 321 71	LC duplex for 72 multimode fibres
1	0 321 72	SC duplex for 36 multimode fibres
1	0 321 73	LC duplex for 72 single-mode fibres
1	0 321 74	SC duplex for 36 single-mode fibres

Pack	Cat. No.	Flat and angled 19" modular fibre optic drawers
		Metal 19" modular fibre 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 fibres 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
1	0 321 02	SC duplex for 24 multimode fibres
1	0 321 04	LC duplex for 48 multimode fibres
1	0 321 06	SC duplex for 24 single-mode fibres
		Sliding, to be equipped with fibre optic blocks Takes any fibre optic block, up to 4 blocks maximum. End stop at a 20° angle
1	0 321 00	Empty drawer
		Sliding, to be equipped with fibre optic blocks - angled Takes any fibre optic block, up to 4 blocks maximum. End stop at a 20° angle
1	0 321 01	Empty

Pack	Cat. No.	Fibre optic blocks
		To be clipped directly onto modular fibre optic drawers to be equipped Cat. Nos 0 321 00/01 or onto fibre optic splice cassette Cat. No 0 321 41
		Single-mode fibre blocks (9/125 µm) - blue
1	0 321 17	ST block for 6 single-mode fibres
1	0 321 10	SC duplex block for 6 single-mode fibres
1	0 321 11	High Density SC duplex block for 12 single-mode fibres
1	0 321 12	SC APC duplex block for 6 single-mode fibres
1	0 321 13	LC duplex block for 6 single-mode fibres
1	0 321 14	LC duplex block for 12 single-mode fibres
1	0 321 15	High Density LC duplex block for 24 single-mode fibres
1	0 321 16	LC APC duplex block for 12 single-mode fibres
1	0 321 33	Single-mode 4 MTP[1] feedthrough adaptor, key up/ key down
		Multimode fibre blocks (62.5 and 50/125 µm) - beige
1	0 321 27	ST block for 6 multimode fibres
1	0 321 20	SC duplex block for 6 multimode fibres
1	0 321 21	High Density SC duplex block for 12 multimode fibres
1	0 321 23	LC duplex block for 6 multimode fibres
1	0 321 24	LC duplex block for 12 multimode fibres
1	0 321 25	High Density LC duplex block for 24 multimode fibres
1	0 321 34	Multimode 4 MTP[1] feedthrough adaptor, key up/ key down
		Multimode fibre blocks (62.5 and 50/125 µm) - aqua
1	0 321 36	LC duplex block for 6 multimode fibres
1	0 321 37	LC duplex block for 12 multimode fibres

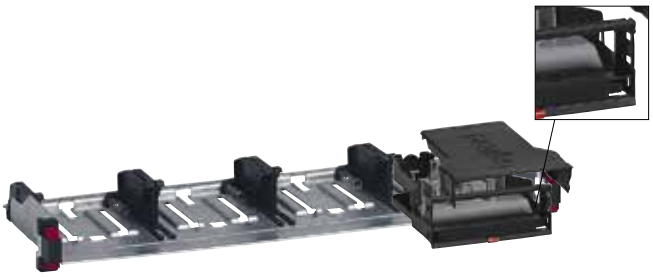
Pack	Cat. No.	Copper block for fibre optic drawer
1	0 321 32	To be clipped directly onto modular fibre optic drawers to be equipped Cat. Nos 0 321 00/01 Allows the mixing of fibre optic and copper Takes up to 5 RJ 45 connectors

Pack	Cat. No.	Accessories for fibre optic drawer to be equipped
		Accessory for receipt of a fan-out
1	0 321 28	To be clipped onto the back of the drawer Enables the entry of preterminated links
		Blanking plate
1	0 321 29	Blanking plate
		Cassette for pigtails
1	0 321 30	Capacity: 24 fibres
		Coiling kit
1	0 321 31	1 accessory

1: MTP is a registered trademark of US Conec Ltd

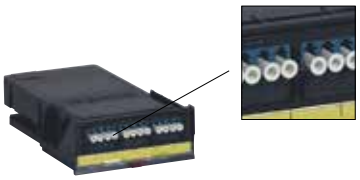
Legrand cabling system, fibre optic LCS³

19" high Density fibre optic panel

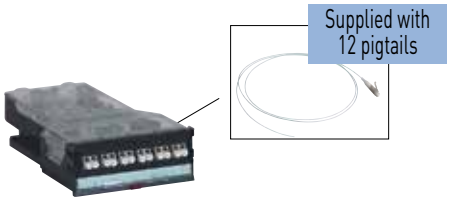


0 321 40 panel equipped with a rear cable management accessory
0 321 46 + 0 321 41

Easy removable cassette 0 321 43



0 321 49



0 321 83

0 321 33

0 321 07

Pack	Cat. No.	19" modular panel to be equipped with cassettes
		To be equipped with a maximum of 4 automatically removable cassettes Equipped with the new-generation Quick-Fix system for automatic (screwless) mounting on enclosure or cabinet uprights Maximum capacity: 48 fibres in SC version, 24 in ST version or 96 in LC version
1	0 321 40	Depth 190 mm, height 1U
		MTP¹ High Density cassettes (compatible with MPO)
		For installation in modular panel Cat. No 0 321 40 Sliding cassettes which can be removed automatically by simply pressing them, simplifying installation and maintenance Removable from the front and back High-performance MTP¹ cassettes, low insertion loss < 0.35 dB Prewired, equipped at rear with one or two male MTP¹ connectors with 12 fibres LC or SC connectors at the front
		Multimode OM4 cassettes (50/125 µm), A/C polarity
1	0 321 42	24 LC fibres
1	0 321 48	12 LC fibres
1	0 321 43	12 SC fibres
		Single-mode OS2 cassettes (9/125 µm), A/C polarity
1	0 321 44	24 LC fibres
1	0 321 49	12 LC fibres
1	0 321 45	12 SC fibres
		Cassettes to be equipped and blanking plate
		For installation in modular panel Cat. No 0 321 40 Sliding cassettes which can be removed automatically by simply pressing them, simplifying installation and maintenance Removable from the front
		Fibre optic splice cassette
1	0 321 41	Takes any modular fibre optic block
		Copper cassette to be equipped
1	0 337 55	Takes 6 Cat. 5e, 6, 6A and 8 copper connectors
		Blanking cassette
1	0 337 57	To be used to fill gaps in the panel
		Zero-U kit for universal fixing
1	0 321 07	Zero-U remote patching solution For universal fixing: 19" uprights, raised access floors, wire and sheet metal cable trays, structural uprights of the enclosure, etc Takes any modular fibre optic cassette and copper cassette Cat. No 0 337 55

Pack	Cat. No.	Pre-equipped cassettes
		For installation directly in modular panel Cat. No. 0 321 40 Pre-equipped cassettes with fitted fibre optic block + sets of 6 or 12 pigtails Sliding cassettes which can be removed automatically by simply pressing them, simplifying installation and maintenance Removable from the front
		Pre-equipped cassettes for OM3 multimode installation (50/125 µm)
1	0 321 80	Equipped with 1 SC duplex block for 6 fibres
1	0 321 81	Equipped with 1 LC duplex block for 6 fibres
1	0 321 82	Equipped with 1 SC duplex block for 12 fibres
1	0 321 83	Equipped with 1 LC duplex block for 12 fibres
		Pre-equipped cassettes for OS2 single-mode installation (9/125 µm)
1	0 321 84	Equipped with 1 SC duplex block for 6 fibres
1	0 321 85	Equipped with 1 LC duplex block for 6 fibres
1	0 321 86	Equipped with 1 SC duplex block for 12 fibres
1	0 321 87	Equipped with 1 LC duplex block for 12 fibres
		MTP1 High Density adaptors
		To be mounted on splice cassette Cat. No 0 321 41 Allow MTP¹/MTP¹ feedthroughs
1	0 321 33	Single-mode 4 MTP¹ adaptor - key up/key down
1	0 321 34	Multimode 4 MTP¹ adaptor - key up/key down
		Accessories for 19" panel to be equipped with cassettes
		Rear cable management accessory
1	0 321 46	Fits on panel Cat. No 0 321 40
		Cord management kit (guide/holder/door)
1	0 321 47	Fits on panel Cat. No 0 321 40, 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

1: MTP is a registered trademark of US Conec Ltd

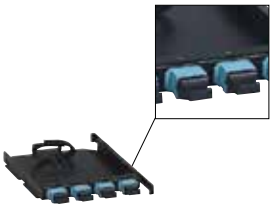
Legrand cabling system, fibre optic LCS³

19" Ultra High Density fibre optic drawers

0 321 50

0 321 90

0 321 55



0 321 56

0 321 94

Pack	Cat. No.	Ultra High Density modular fibre optic drawers, to be equipped with 12-fibre cassettes
		Fixed modular chassis for holding cassettes 4 U maximum capacity (holds up to 48 cassettes): - 576 LC fibres 2 U maximum capacity (holds up to 24 cassettes): - 288 LC fibres 1 U maximum capacity (holds up to 12 cassettes) - 144 LC fibres
		Fibre optic drawer with cord management at the front for 12-fibre cassettes
1	0 321 51	1 U
		Fibre optic drawers with cord management at front and back for 12-fibre cassettes Depth: 595 mm
1	0 321 50	1 U
1	0 321 52	2 U
1	0 321 53	4 U
		Ultra High Density 12-fibre cassettes
		Clip directly into fibre optic drawers Cat. Nos. 0 321 50/51/52/53 Cassettes slide into above chassis Cassettes can be removed from the front and back MPO high-performance cassettes Low insertion loss < 0.35 dB A/C polarity
		Multimode OM4 cassettes (50/125 µm) For 50/125 µm multimode installation, OM4 type
1	0 321 54	MPO cassette (MTP[1] compatible) 12 OM4 LC fibres, polarity A/C
		Single-mode OS2 cassette (9/125 µm) For 9/125 µm single-mode installation, OS2 type
1	0 321 55	MPO cassette (MTP[1] compatible) 12 OS2 LC fibres, polarity A/C
		Adaptors for 12-fibre Ultra High Density installation
		Clip into Ulta High Density fibre optic drawers for 12-fibre cassettes Cat. Nos 0 321 50/51/52/53
		MPO adaptors (MTP[1] compatible)
1	0 321 56	Multimode 4 MTP adaptor - key up/key down
1	0 321 57	Single-mode 4 MTP adaptor - key up/key down
		LC adaptor
1	0 321 58	12 LC multimode adaptor

Pack	Cat. No.	Ultra High Density modular fibre optic drawers, to be equipped with 8-fibre cassettes
		Fixed modular chassis for holding cassettes 4 U maximum capacity (holds up to 72 cassettes): - 576 LC fibres 2 U maximum capacity (holds up to 36 cassettes): - 288 LC fibres 1 U maximum capacity (holds up to 18 cassettes) - 144 LC fibres
		Fibre optic drawers with cord management at front and back for 8-fibre cassettes Depth: 595 mm
1	0 321 90	1 U
1	0 321 91	2 U
1	0 321 92	4 U
		Ultra High Density 8-fibre cassettes
		Clip directly into fibre optic drawers Cat. Nos. 0 321 90/91/92 Cassettes slide into above chassis Cassettes can be removed from the front and back MPO high-performance cassettes Low insertion loss < 0.35 dB A/C polarity
		Multimode OM4 cassettes (50/125 µm) For 50/125 µm multimode installation, OM4 type
1	0 321 93	MPO cassette (MTP[1] compatible) 8 OM4 LC fibres, polarity A/C
		Single-mode OS2 cassette (9/125 µm) For 9/125 µm single-mode installation, OS2 type
1	0 321 94	MPO cassette (MTP[1] compatible) 8 OS2 LC fibres, polarity A/C
		Adaptors for 8-fibre Ultra High Density installation
		Clip into Ultra High Density fibre optic drawers for 8-fibre cassettes Cat. Nos 0 321 90/91/92
		MPO adaptors (MTP1 compatible)
1	0 321 95	Multimode 4 MTP[1] adaptor - key up/key down
1	0 321 96	Single-mode 4 MTP[1] adaptor - key up/key down
		LC adaptors
1	0 321 97	8 LC multimode adaptor
1	0 321 98	8 LC single-mode adaptor
1	0 321 99	APC 8 LC single-mode adaptor

1: MTP is a registered trademark of US Conec Ltd

Legrand cabling system, fibre optic LCS³

pigtails, glue-on connectors and fan-out units

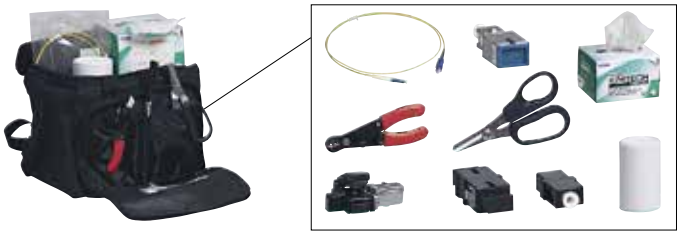
0 322 20

0 322 31

Pack	Cat. No. 1 m	Cat. No. 2 m	Pigtails
			LSZH For making quick, reliable and high-performance fibre 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
			50/125 µm - OM2 (PC)
1	0 322 10	0 322 13	SC connectors
1	0 322 11	0 322 14	LC connectors
1	0 322 12	0 322 15	ST connectors
			50/125 µm - OM3 (PC)
1	0 322 20	0 322 23	SC connectors
1	0 322 21	0 322 24	LC connectors
1	0 322 22		ST connectors
			50/125 µm - OM4 (PC)
1	0 322 30	0 322 33	SC connectors
1	0 322 31	0 322 34	LC connectors
1	0 322 32		ST connectors
			9/125 µm - OS2 (APC or UPC) - OS1 compatible
1	0 322 40	0 322 45	SC-APC connectors
1	0 322 41	0 322 46	SC-UPC connectors
1	0 322 42	0 322 48	LC-APC connectors
1	0 322 43	0 322 47	LC-UPC connectors
1	0 322 44	0 322 49	ST-UPC connectors
			Sets of 6 LC pigtails
1	0 336 25		6 OS1/OS2 LC-UPC pigtails
1	0 326 27		6 OM3 LC-PC pigtails
			Sets of 12 LC pigtails
1	0 326 24		12 OS2 LC-UPC pigtails
1	0 326 26		12 OM3 LC-UPC pigtails
1	0 326 71		12 OM4 LC-UPC pigtails
			Heat-shrinkable sleeve for pigtails
1	0 327 44		40 mm - pack of 50 sleeves
			Fan-out units
			For 900 µm sheathing of optical fibres Take 250 µm fibre diameters
1	0 330 48		6-fibre fan-out unit
1	0 330 49		12-fibre fan-out unit

Legrand cabling system, fibre optic LCS³

case and quick-connect connectors



0 322 70

0 322 72

0 322 73

0 322 75

0 322 83

0 322 81

0 322 85

Pack	Cat. No.	Tool case for preparing optical fibre for quick-connect fibre optic connectors
1	0 322 70	Provides the tools required for preparing optical cables, for carrying out initial tests of the connection of fibres 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. 0 322 70 Quick-connect, reliable and reusable up to 5 times To be used to lock the fibre inside the connector An indicator light is used to test the connection No glue or polishing needed Can be installed on 900 µm fibre optics For 250 µm fibre, 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
1	0 322 71	LC PC 50/125 µm, 900/250 µm
1	0 322 72	SC PC 50/125 µm, 900/250 µm
		OS2 single-mode connectors Set of 12 connectors
1	0 322 73	LC UPC 9/125 µm, 900/250 µm
1	0 322 74	SC UPC 9/125 µm, 900/250 µm
1	0 322 75	SC APC 9/125 µm, 900/250 µm
		Precision cleaver for updating case Cat. No 0 326 90
1	0 322 80	Enables precision-cutting of fibre optics and the use of quick-connect connectors Cat. Nos 0 322 71 to 0 322 75 with case Cat. No 0 326 90
		Fibre optic cleaning accessories
1	0 322 83	MPO/MTP[1] ferrule cleaner
1	0 322 81	LC ferrule cleaner (PC/APC)
1	0 322 82	SC ferrule cleaner (PC/APC)
1	0 322 84	LC replacement cartridge
1	0 322 85	SC replacement cartridge
1	0 322 76	Fibre stripper
1	0 322 77	Wipes
1	0 322 78	Cleaning spray

1: MTP is a registered trademark of US Conec LtdWW

Legrand cabling system, fibre optic LCS³

patch cords and feedthrough sockets

Fitted at each end with 2 connectors with ceramic ferrule. Individually packed and tested (report supplied). LSZH Zipcord sheath
Other configurations on request

Pack	Cat. No.	OS1/OS2 single-mode fibre optic cords (9/125 µm)
		Max. optical losses/Master: 0.25 dB For 9/125 µm single-mode installations, OS 1/OS 2 type. Yellow sheaths
		SC/SC duplex cords
3	0 326 00	Length: 1 m
3	0 326 01	Length: 2 m
3	0 326 02	Length: 3 m
		SC/LC duplex cords
3	0 326 03	Length: 1 m
3	0 326 04	Length: 2 m
3	0 326 05	Length: 3 m
		LC/LC duplex cords
3	0 326 28	Length: 0.5 m
3	0 326 06	Length: 1 m
3	0 326 07	Length: 2 m
3	0 326 08	Length: 3 m
3	0 326 29	Length: 5 m
		LC/LC Uniboot duplex cords
		Reversible polarity
3	0 326 86	Length: 1 m
3	0 326 87	Length: 2 m
3	0 326 88	Length: 3 m
3	0 326 89	Length: 5 m
3	0 326 92	Length: 10 m

Pack	Cat. No.	OM4 multimode fibre optic cords (50/125 µm)
		Suitable for 10 Gb Ethernet networks Max. optical losses/Master: 0.15 dB For 50/125 µm multimode installation, OM4 type Aqua sheaths
		SC/SC duplex cords
3	0 326 30	Length: 1 m
3	0 326 31	Length: 2 m
3	0 326 32	Length: 3 m
		LC/LC duplex cords
3	0 326 33	Length: 0.5 m
3	0 326 34	Length: 1 m
3	0 326 35	Length: 2 m
3	0 326 36	Length: 3 m
3	0 326 37	Length: 5 m
		LC/LC Uniboot duplex cords
		Reversible polarity
3	0 326 95	Length: 1 m
3	0 326 96	Length: 2 m
3	0 326 97	Length: 3 m
3	0 326 98	Length: 5 m
3	0 326 99	Length: 10 m

Pack	Cat. No.	OM3 multimode fibre optic cords (50/125 µm)
		Suitable for 10 Gb Ethernet networks Max. optical losses/Master: 0.25 dB For 50/125 µm multimode installation, OM3 type Aqua sheaths
		SC/SC duplex cords
3	0 326 09	Length: 1 m
3	0 326 10	Length: 2 m
3	0 326 11	Length: 3 m
		SC/LC duplex cords
3	0 326 12	Length: 1 m
3	0 326 13	Length: 2 m
3	0 326 14	Length: 3 m

Pack	Cat. No.	OM3 multimode fibre optic cords (50/125 µm) continued
		LC/LC duplex cords
3	0 326 15	Length: 1 m
3	0 326 16	Length: 2 m
3	0 326 17	Length: 3 m

Pack	Cat. No.	OM2 multimode fibre optic cords (50/125 µm)
		Max. optical losses/Master: 0.25 dB For 50/125 µm multimode installation, OM2 type Orange sheaths
		ST/ST duplex cords
3	0 330 80	Length: 1 m
3	0 330 81	Length: 2 m
3	0 330 82	Length: 3 m
		SC/SC duplex cords
3	0 330 69	Length: 1 m
3	0 330 70	Length: 2 m
3	0 330 71	Length: 3 m
		ST/SC duplex cords
3	0 330 72	Length: 2 m
3	0 330 73	Length: 3 m
		LC/LC duplex cord
3	0 330 61	Length: 2 m
		SC/LC duplex cords
3	0 330 75	Length: 1 m
3	0 330 63	Length: 2 m
3	0 330 76	Length: 3 m
		LC/ST duplex cord
3	0 330 65	Length: 2 m

Pack	Cat. No.	Fibre optic feedthrough sockets
		Equipped with a duplex feedthrough To be used to connect two fibres (equipped with their connector) Supplied with protection caps Equipped with a transparent marker-holder 2 modules
		2 x ST socket
		Bayonet connection (STII compatible)
1	0 786 16	○ White
		2 x SC socket
		Push-pull connection
1	0 786 17	○ White
		2 x LC socket
		Push-pull connection
1	0 786 18	○ White
		2 x SC/APC socket
		Push-pull connection With shutters
1	0 786 14	○ White

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

Audio socket

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

Cords and cables

Audio/video system

kits

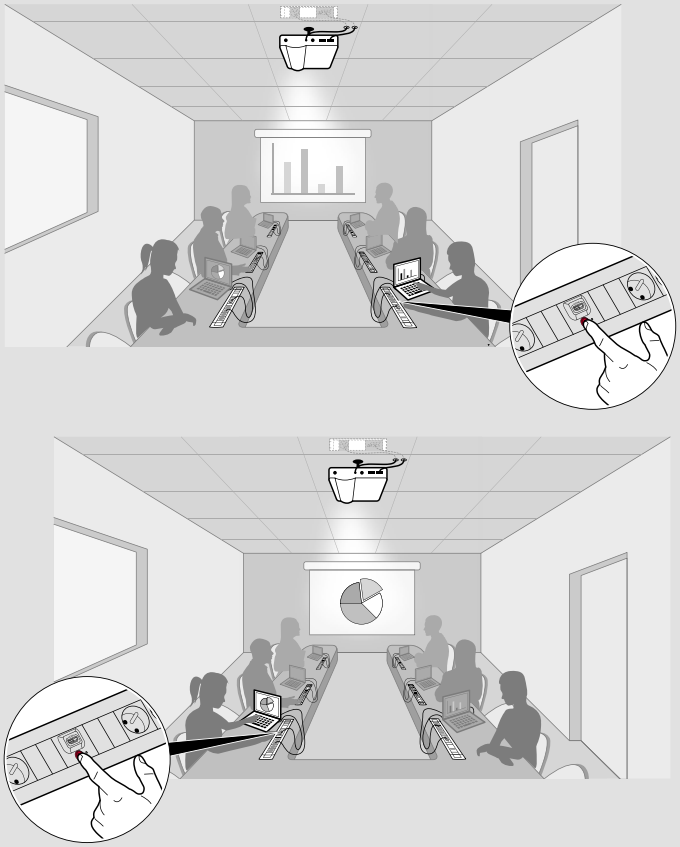
5 720 98

5 722 69 + plate

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

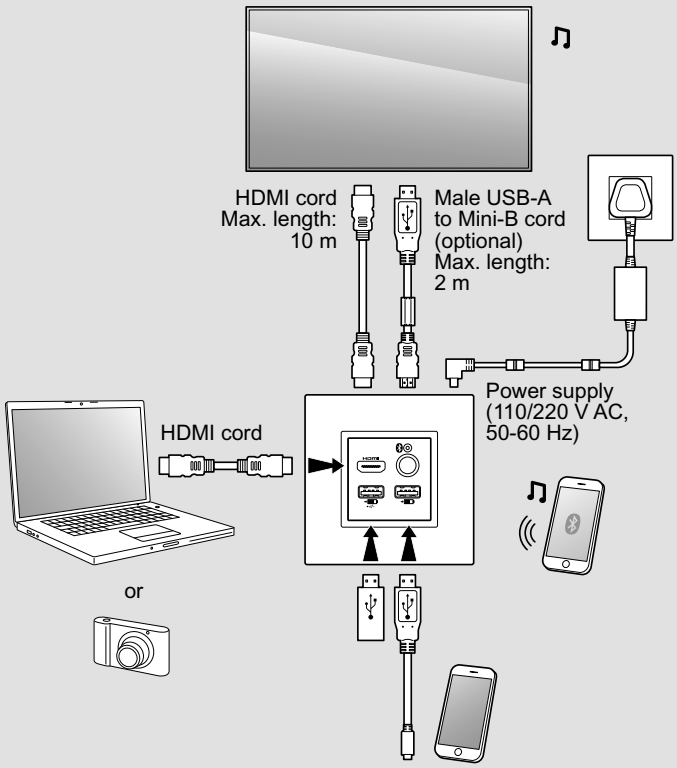
Pack	Cat. No.	Multiparticipant HDMI audio/video projection
	Arteor	**Selector switch transmitters**
1	5 720 98	Allows different participants in the room to play the presentation on their PC by pressing the control takeover button without disconnecting the video projector cable For use with other transmitters (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. 92) 2 modules
		Receivers
1	5 720 99	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 HDMI® with Ethernet cords (not supplied, see p. 92) 24 V power supply (supplied) 2 modules
		MediaHub
		Allows the users to: - watch films located on a PC or a camcorder on their TV: HDMI connector - watch the contents of a USB stick on their TV: USB data connection - charge devices: USB sockets (total power: 3 A) - listen to music currently located on their smartphone/tablet, etc. : Bluetooth function Inputs: 2 USB chargers including 1 USB data, HDMI, Bluetooth audio Output: HDMI and USB data Power supply with transformer (supplied) Supplied with cover plate and support 2 modules
	Arteor	
1	5 722 69	○ White
1	5 727 69	● Magnesium

Multiparticipant HDMI audio/video projection



MediaHub

Charger, Bluetooth data, HDMI and USB in 1 product: connect these devices to view their contents on your TV



Audio/video system

audio/video sockets - Arteor

0 787 78

0 789 79L

0 517 38

0 787 77

0 787 99

Pack	Cat. No.	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 1.4 preterminated sockets - 1 module Equipped with a 15 cm cord and 2 female connectors
1	5 720 96	○ White
1		● Aluminium
1	5 725 96	● Magnesium
		HDMI 1.4 preterminated sockets - 2 modules
1	5 722 99	○ White
1		● Aluminium
1	5 725 99	● Magnesium
		HDMI audio/video extender
1	0 517 38	For connecting HDMI terminals up to 60 m. 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
1	5 720 90	○ White
1	5 725 90	● Magnesium

Pack	Cat. No.	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
1	5 720 97	○ White
1		● Aluminium
1	5 725 97	● Magnesium
		Screw-type sockets - 2 modules
1	5 722 82	○ White
1		● Aluminium
1	5 727 82	● Magnesium
		Screw-type sockets + 3.5 mm Jack - 2 modules
1	5 722 88	○ White
1	5 727 88	● Magnesium
		Solder-type sockets - 1 module
1	5 722 79	○ White
1	5 727 79	● Magnesium
		Infrared ON/Standby controls for video projector
		To be used to switch on a video projector or set it to standby Must be combined with a push-button Work with any infrared video projector or other product with an infrared remote control (TV, air conditioning, games console, etc) using a learning process Installed near the switch controlling the lighting in a room, the push-button sends the command to the IR ON/Standby control which replaces the manufacturer's remote control and makes it easier to switch the video projector on and off
1	5 720 89	○ White

1: Can be installed in receptacles for floor sockets

Audio/video cables and cords,
See p. 126-127

Multiparticipant HDMI audio/video projection,
See p. 123

Audio/video system

audio/video sockets - Arteor (continued)

5 720 91

5 720 92

5 722 73

5 722 83

5 722 70

5 722 84

Pack	Cat. No.	3.5 mm female Jack sockets
		For making audio links
		Preterminated sockets - 1 module
		Equipped with a 15 cm cord and 2 female connectors
1	5 720 91	○ White
1	5 725 91	● Magnesium
		Screw-type sockets - 1 module
1	5 722 74	○ White
1	5 727 74	● Magnesium
		Solder-type sockets - 1 module
1	5 722 78	○ White
1	5 727 78	● Magnesium

		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
		Equipped with a 15 cm cord and 2 female connectors
1	5 720 92	○ White
1	5 725 92	● Magnesium
		Connection via screw terminals
1	5 722 72	○ White
1	5 727 72	● Magnesium

		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
1	5 722 73	○ White
1	5 727 73	● Magnesium

Pack	Cat. No.	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
		Female sockets
1	5 722 83	○ White
1	5 727 83	● Magnesium
		Male sockets
1	5 722 77	○ White
1	5 727 77	● Magnesium

		Loudspeaker sockets
		For loudspeaker stereo audio link 4 mm² terminal
		Sockets - 1 module
10	5 722 70	○ White
10	5 727 70	● Magnesium
		Sockets - 2 modules
10	5 722 80	○ White
10	5 727 80	● Magnesium

		100 V line attenuators
		25 W - 2 modules To be used to control the power from a 100 V PA system line
1	5 722 84	○ White
1	5 727 84	● Magnesium

		Female BNC 75 sockets - 1 module
		Provide the composite video link for any peripheral device such as a DVD player, camera, video recorder, etc.
1	5 722 76	○ White
1	5 727 76	● Magnesium

USB Data socket,
See p. 127

Audio/video system

HDMI cords and adaptors, HD15 cords and audio cords

0 517 33

0 517 27

0 779 30

0 514 03

HDMI cords, booster and adaptors

Pack	Cat. No. Plastic bag	Cat. No. Plastic bag with hook	
			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 1.4 cords Support 4K and 1080P video resolution Gold-plated connectors
1	0 517 32	0 398 51	Length 1 m
1	0 517 33	0 398 52	Length 2 m
1	0 517 34	0 398 53	Length 3 m
1	0 517 27	0 398 54	Length 5 m
1	0 517 35	0 398 55	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 1.4 cords Support 1080P and 720P video resolution Gold-plated connectors
1	0 517 20		Length 10 m
1	0 517 36		Length 15 m
			HDMI to micro HDMI cord
1		0 398 56	Length 2 m
			HDMI booster
1	0 779 30		For extending an HDMI connection Consists of 2 female connectors and must be used in addition to HDMI cords Does not need an external power supply
			90° HDMI adaptors
1	0 517 37	0 398 57	Male HDMI to female HDMI with 90° angle To be used to make a connection when space is limited
			Display Port cords
1	0 514 00	0 398 58	Length 2 m For connecting a Display Port socket to an audio/video terminal (PC, monitor, etc)

HD15 cords

Pack	Cat. No. Plastic bag	Cat. No. Plastic bag with hook	
			Male/male HD15 cords For connecting an HD15 socket to a video terminal (PC, video projector, etc) Support QXGA resolution (2048x1536)
1	0 517 29	0 398 50	Length 2 m
1	0 517 30		Length 5 m
1	0 517 23		Length 10 m
1	0 517 31		Length 15 m
			HD15 cord + 3.5 mm Jack
1	0 517 22		Length 2 m For connecting an HD15 video socket and a 3.5 mm audio jack to a terminal (PC, video projector)

Audio cords

Pack	Cat. No. Plastic bag	Cat. No. Plastic bag with hook	
			RCA male/male stereo audio cords
1	0 514 03	0 398 67	Length 2 m
1	0 514 04	0 398 68	Length 5 m
			Jack 3.5 mm male to 2 RCA male Y audio cords
1	0 514 05	0 398 69	Length 2 m
1	0 514 06	0 398 70	Length 5 m
			Jack 3.5 mm male / male audio cords
1	0 514 07	0 398 71	Length 2 m
1	0 514 08	0 398 72	Length 5 m
			TOSLINK optical digital cable
1		0 398 73	Length 2 m
			XLR cord
1	0 517 24		Length 10 m For connecting an XLR socket to an audio peripheral (microphone, amplifier, etc)

HDMI extender
p. 124

Audio/video system

USB Type-C adaptors and cords, data cords and cables

0 514 12

0 514 13

0 514 10

0 514 02

Pack	Cat. No. Plastic bag	Cat. No. Plastic bag with hook	USB Type-C adaptors
			Male USB 3.1 Type-C/female HDMI adaptors
1	0 514 12	0 398 66	For connecting a USB Type-C device to the HDMI port of a video projector or TV set to play audio and video
			Male USB Type-C/female RJ 45 adaptor
1	0 514 13		For connecting a USB Type-C device to the computer network

Pack	Plastic bag	Plastic bag with hook	USB 3.1 Type-C cords
1	0 514 10	0 398 63	Male USB 3.1 Type-C/male Type-C cord - length 1 m To be used to load, transfer data and play audio/video

Pack	Plastic bag	Plastic bag with hook	USB data cords
			To be used to transfer data between a USB Data socket and a peripheral (hard disk, printer, scanner, etc)
			Length 1 m
1		0 398 61	Male USB 2.0 A/male Micro B cord
1		0 398 62	Male USB 3.0 A/male Lightning cord
1		0 398 65	Male USB 2.0 Type-C/male micro B USB cord
			Length 2 m
1	0 514 01	0 398 59	Male USB 3.0 A/male A cord
1	0 514 02	0 398 60	Male USB 3.0 A/male B cord
1	0 514 11	0 398 64	Male USB 2.0 Type-C/male USB-A cord

Pack	Plastic bag with hook	Cat. 6 U/UTP RJ 45 cords
		RJ 45 - RJ 45 flat
1	0 398 74	Length 2 m
1	0 398 75	Length 5 m
1	0 398 76	Length 10 m
1	0 398 77	Length 15 m
1	0 398 78	Length 20 m
1	0 398 79	Length 30 m

Pack	Cat. No.	Cables
		HDMI cable
1	0 327 80	Length 20 m For connecting HDMI sockets at a distance of up to 10 m
		VGA cable
1	0 327 81	Length 20 m For full pin connection of HD15 sockets at a distance of up to 15 m
		Loudspeaker cable
1	0 514 09	Length 15 m For connecting an amplifier and speakers

HDMI extender
p. 124

Audio/video system

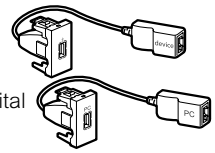
USB Data and SUB D data sockets - Arteor

5 720 94

5 720 23

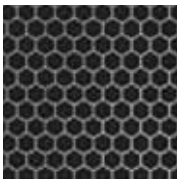
Pack	Cat. No.	Female USB Data sockets
		For connecting USB devices (printer, scanner, external hard drive, interactive panel) 1 module
		Preterminated - USB 3.0 Max. cable length: 5 m Recommended cable: USB A Equipped with cable length 15 cm
1	5 720 94	○ White
	5 725 94	● Magnesium
		Screw-type - USB 2.0 Max. cable length: 5 m Recommended cable: USB A Connection using screw terminal blocks with 1 mm² cross-section
1		○ White
1		● Aluminium

Pack	Cat. No.	Female USB Data Type-A extender - for data transfer
1	5 720 23	○ 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)



Legrand SmartRak® 2.0 server cabinet

server cabinets and cable entries



Fully perforated door for optimum air flow

Server rack cabinet suitable for use with patching, network and server equipment.
Stand-alone racks come with quick release side panels.
Supplied with 2 single doors (600 mm width) or 1 single door and 1 double-leaf door (800 mm width) - Standard door lock supplied with 02 Keys.

Fully perforated honeycomb door with up to 80% ventilation.
Plain top panel come with 2 cable entries with brush.
Racks are equipped with 2 pairs panel mounts (front and back) with "U" markings.
Racks supplied with 50 cage nuts and screws.
Static weight load : 1,200 Kg.
Supplied assembled.

SmartRak 2.0 - Stand alone rack

Pack	Cat. No. ● Assembled	Capacity	Width (mm)	Depth (mm)
1	SR27606BVA	27U	600	600
1	SR27608BVA	27U	600	800
1	SR27610BVA	27U	600	1000
1	SR27611BVA	27U	600	1100
1	SR27812BVA	27U	800	1200
1	SR42610BVA	42 U	600	1000
1	SR42611BVA	42 U	600	1100
1	SR42606BVA	42 U	600	600
1	SR42608BVA	42 U	600	800
1	SR42808BVA	42 U	800	800
1	SR42810BVA	42 U	800	1000
1	SR42811BVA	42 U	800	1100
1	SR42812BVA	42 U	800	1200
1	SR45606BVA	45U	800	600
1	SR45608BVA	45U	600	800
1	SR45808BVA	45U	800	800
1	SR45610BVA	45U	600	1000
1	SR45611BVA	45U	600	1100
1	SR45810BVA	45U	800	1000
1	SR45811BVA	45U	800	1100
1	SR45812BVA	45U	800	1200
1	SR47606BVA	47U	600	600
1	SR47608BVA	47U	600	800
1	SR47808BVA	47U	800	800
1	SR47610BVA	47U	600	1000
1	SR47810BVA	47U	800	1000
1	SR47812BVA	47U	800	1200

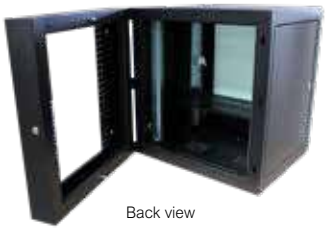
Accessories

Pack	Cat. No.	
		Fan tray
1	SRFTR0600	Fan tray assembly (600D x 2 Fans) C13 input + C13~C14 Cord (2m)
1	SRFTR0800	Fan tray assembly (800D x 3 Fans) C13 input + C13~C14 Cord (2m)
1	SRFTR1000	Fan tray assembly (1000D x 4 Fans) C13 input + C13~C14 Cord (2m)
1	SRFTR1100	Fan tray assembly (1100D x 4 Fans) C13 input + C13~C14 Cord (2m)
1	SRFTR1200	Fan tray assembly (1200D x 4 Fans) C13 input + C13~C14 Cord (2m)
		Sliding tray
		Colour : Black (RAL 9005)
		Loading Capacity 50Kg
1		1U Telescopic Tray
4	046510	Shelf depth 625mm for depth 1000mm
		Fixed tray
1	MVSSR0606	Fixed tray Bl 494x385 SR0606
1	MVSSR0608	Fixed tray Bl 494x585 SR0608
1	MVSSR0610	Fixed tray Bl 494x785 SR0610
1	MVSSR0808	Fixed tray Bl 694x585 SR0808
1	MVSSR0810	Fixed tray Bl 694x785 SR0810
		Plinth
1	SRPL0606	SmartRak II Plinth Bl 600x600
1	SRPL0608	SmartRak II Plinth Bl 600x800
1	SRPL0610	SmartRak II Plinth Bl 600x1000
1	SRPL0611	SmartRak II Plinth Bl 600x1100
1	SRPL0612	SmartRak II Plinth Bl 600x1200
1	SRPL0806	SmartRak II Plinth Bl 800x600
1	SRPL0808	SmartRak II Plinth Bl 800x800
1	SRPL0810	SmartRak II Plinth Bl 800x1000
1	SRPL0811	SmartRak II Plinth Bl 800x1100
1	SRPL0812	SmartRak II Plinth Bl 800x1200
		Bay-up kit
1	SRBU01	SmartRak standard bay up kit for joining 2 racks Consists of 4 bay up plates (Top and bottom, front and back)

Legrand EzRak wall mount cabinet

pivoted swing frame cabinets

Front view



Back view

Welded frame (Pivoted swing)
Front and side access (Spring pin removable type)
Quick release reversible safety glass door
Strong light weight construction
Adjustable 19" panel mounts and front tray (1U)
Wall mounting kit supplied
Material: Cold rolled steel with panel mounting finished with Blue Zinc
Exhaust fan
Supplied assembled
Load rating : 40Kg
Color : Black Textured (RAL 9005)

EZRAK wall mount cabinet

Pack	Cat. No.	● Assembled	Capacity	Width (mm)	Depth (mm)
1		WB600-6U-Pivot	6U	600	600
1		WB600-9U-Pivot	9U	600	600
1		WB600-12U-Pivot	12U	600	600
1		WB600-15U-Pivot	15U	600	600
1		WB600-18U-Pivot	18U	600	600
1		WB600-24U-Pivot	24U	600	600

Accessories for wall mount cabinet

Pack	Cat. No.	
1	FT-2	Set of 2 exhaust fans with fan tray
1	FMT-1U	19" Front mount tray - 1U. Loading capacity 25Kg

Legrand cabling system LCS³ enclosures

19" accessories

0 465 22

0 465 23

0 465 29

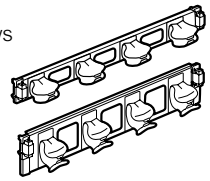
0 465 32

19" Cable feedthrough panels

For organising and running patch cords. Black RAL 9005

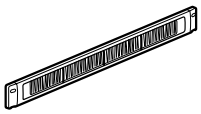
Metal, 2 axes, Quick-Fix

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



Pack	Cat. No.	
1	0 465 22	1 U
1	0 465 23	2 U
1	6 465 20	Cable management feedthrough panel 19" 1U metal screw fix black
1	6 465 21	Cable management feedthrough panel 19" 2U metal screw fix black

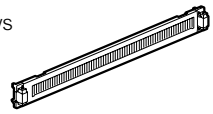
Plastic with brush, snap on



Pack	Cat. No.	
1	0 465 28	1 U
1	0 465 29	2 U

Metal with brush, Soluclip

Quick installation without screws



Pack	Cat. No.	
1	0 465 30	1 U
1	0 465 31	2 U

1 U front panels

Pack	Cat. No.	
25	4 462 10	Set of 25 front panels to ensure the 19" area is weatherproof For installation between 19" profiles No fasteners needed to hold the front panel securely Weatherproof accessories save energy by preventing air leaks Plastic black RAL 9005

19" Blanking plates

Black RAL 9005

Plastic, direct clipping

Pack	Cat. No.	
1	0 465 32	1 U
1	0 465 33	2 U

Metal, Quick-Fix

Quick installation without screws

Pack	Cat. No.	
1	0 465 38	1 U
1	0 465 39	2 U
1	0 465 40	3 U

19" Lighting kit

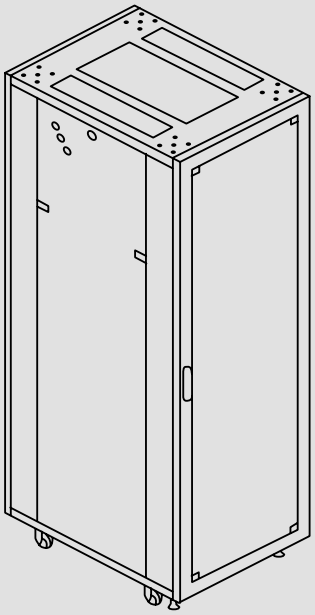
Pack	Cat. No.	
1	0 464 91	1 U 19" metal panel equipped with a LED lighting kit Quick installation without screws

Legrand SmartRak 2.0 server cabinet

Compliance with standards

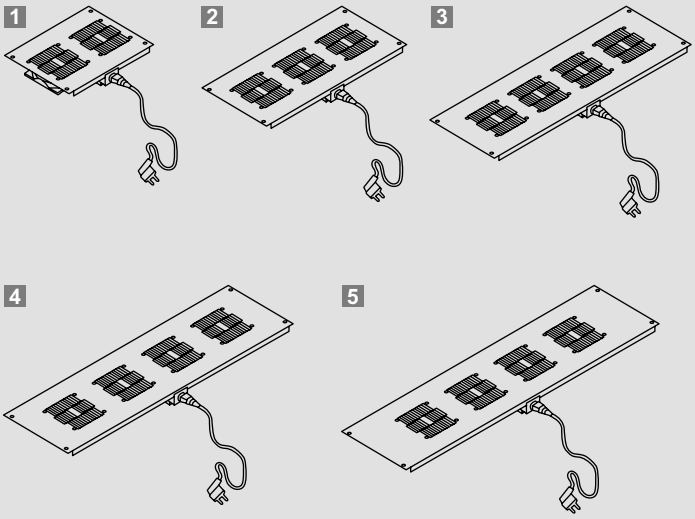
Legrand SmartRak comply with the following standards

IEC 60297	Mechanical structures for electronic equipment - Dimensions of mechanical structures of the 482,6 mm (19 in) series - Part 3-100: Basic dimensions of front panels, subracks, chassis, racks and cabinets
EN 60950	Information technology equipment - Safety - Part 1: General requirements
EIA-310-D	Cabinets, Racks, Panels, and Associated Equipment

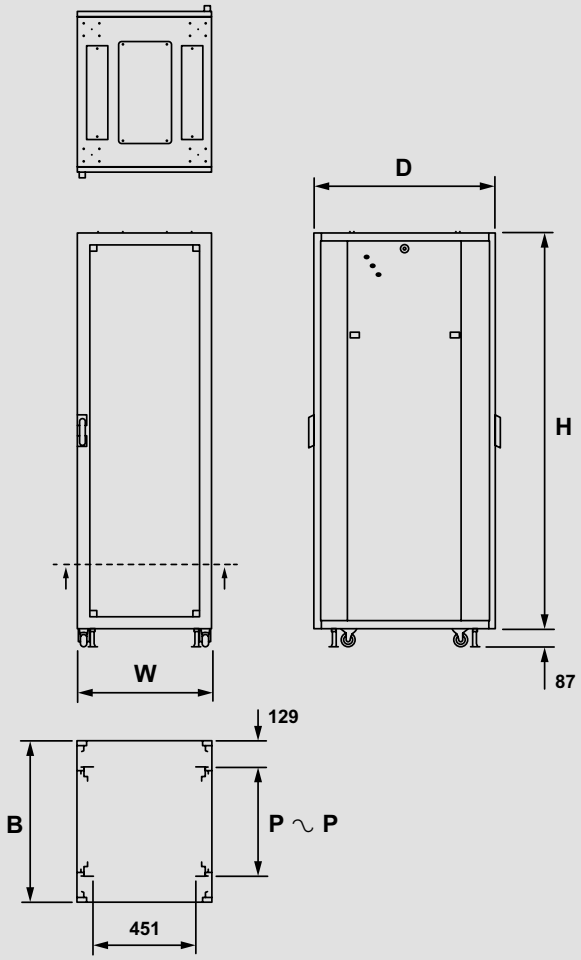


Fan tray

Item	Part number	Compatible with	Nbr of fan
1	SRFTR0600	For 600mm depth racks	2
2	SRFTR0800	For 800mm depth racks	3
3	SRFTR1000	For 1000mm depth racks	4
4	SRFTR1100	For 1100mm depth racks	4
5	SRFTR1200	For 1200mm depth racks	4



Dimensions (mm)



Capacity	H (mm)
27	1,295
42	1,962
45	2,051
47	2,140

Depth	D (mm)	Panel to Panel (mm)
600	600	340
800	800	540
1000	1,000	740
1100	1,100	740 to 840
1200	1,200	740 to 940

First pair of panel mount will be pre-positionned for assembled cabinet at 100 mm from the door

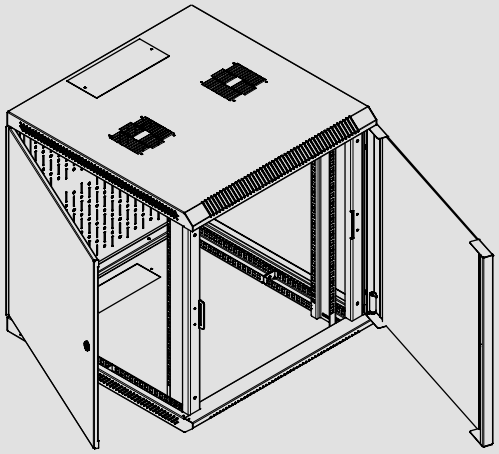
Width	W (mm)
600	598
800	798

Legrand EzRak wall mounted cabinet

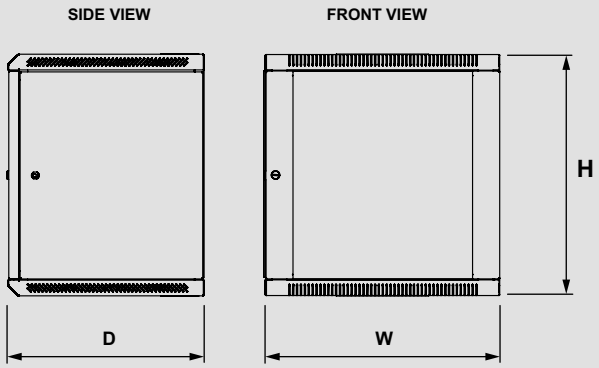
Compliance with standards

Legrand EzRak wall mount comply with the following standards

IEC 60297	Mechanical structures for electronic equipment - Dimensions of mechanical structures of the 482,6 mm (19 in) series - Part 3-100: Basic dimensions of front panels, subracks, chassis, racks and cabinets
DIN 41494 - 8	Components on front panels; mounting conditions, dimensions
EN 60950	Cabinets, Racks, Panels, and Associated Equipment
DIN VDE 0100	Erection of power installations with rated voltages below 1000
EIA-310-D	Cabinets, Racks, Panels, and Associated Equipment



Dimensions (mm)



Capacity	Height	Depth	Width
6U	351.30	500/600	600.00
9U	484.60	500/600	600.00
12U	618.00	500/600	600.00
15U	752.00	500/600	600.00
18U	886.00	500/600	600.00
24U	1,020.00	500/600	600.00

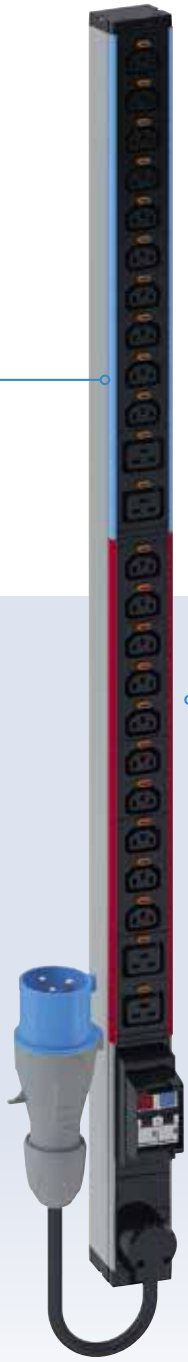
CORD LOCKING SYSTEM

Innovation at the heart of PDUs

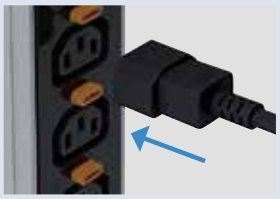
to prevent accidental disconnection

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 guarantees absolute safety!

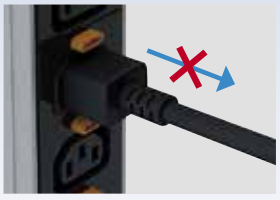
An innovative technical solution: very easy to identify thanks to the orange buttons next to each outlet.



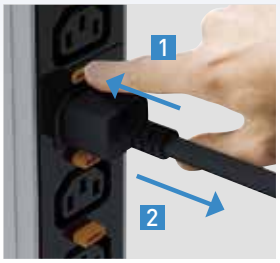
A universal system: takes all cords for standard C13 and C19 outlets.



CONNECTION



AUTO LOCKING



UNLOCKING

Legrand cabling system LCS³ energy distribution

three-phase Zero-U & horizontal (1U/2U) Basic PDU

6 468 75

To provide A electric power for IT equipment in 19" enclosures
Three phases Zero-U PDUs 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

Pack	Cat. No.	PDU Basic
		IEC 60320 standard
1	6 468 70	18 C13 outlets + 6 C19 outlets with cord locking system. 3 m power supply cord with IEC 60309 16 A 3P+N+E plug

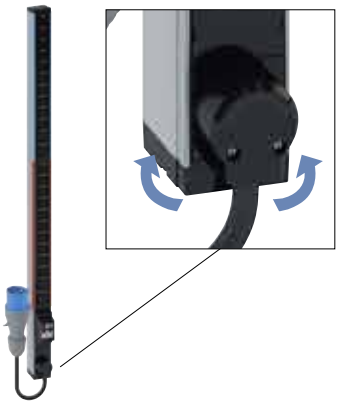
Legrand cabling system LCS³ energy distribution

single-phase Zero-U & horizontal (1U/2U) Basic Power Distribution (PDU)

6 468 15

6 468 09

6 468 53



6 468 61

Pack	Cat. No.	PDU Basic
		IEC 60320 standard
1	6 468 56	24 C13 outlets with cord locking system Connection on terminal block up to 6 mm²
1	6 468 57	24 C13 outlets with cord locking system 3 m power supply cord with IEC 60309 32 A 2P+E plug
1	6 468 60	20 C13 outlets + 4 C19 outlets with cord locking system. Connection on terminal block up to 6 mm²
1	6 468 61	20 C13 outlets + 4 C19 outlets with cord locking system. 3 m power supply cord with IEC 60309 32 A 2P+E plug

		19" PDU Basic
		IEC 60320 standard
		Connection on terminal block (except Cat. No 6 468 15)
1	6 468 14	10 C13 outlets with cord locking system
1	6 468 15	12 C13 outlets with cord locking system 3 m power supply cord with IEC 60309 16 A 2P+E plug
1	6 468 09	6 C13 outlets + 2 C19 outlets with cord locking system
1	6 468 07	6 C19 outlets with cord locking system

Legrand cabling system LCS³ energy distribution

intelligent metered and switched PDUs

6 460 20

6 460 21

6 460 12 6 460 13 6 460 15 6 460 16 6 460 25 6 460 24

Power distribution units with metering at inlet level and circuit breaker level
Possibility of environmental monitoring through one of the optional external sensors (temperature, humidity...)

Pack	Cat. No.	19” intelligent metered PDUs
		IEC 60320 standard
1	6 460 10	12 C13 outlets, with 3 m power supply cord with C20 plug
1	6 460 11	12 C13 outlets and 4 C19 outlets, with 3 m power supply cord with IEC 60309 32 A 2P+E plug

Pack	Cat. No.	19” intelligent metered and switched PDUs
	CORD LOCKING SYSTEM	**IEC 60320 standard**
1	6 460 20	8 C13 outlets with cord locking system and switch 3 m power supply cord with C14 10/16 A 2P+E plug
1	6 460 21	16 C13 outlets with cord locking system and switch 3 m power supply cord with IEC 60309 32 A 2P+E plug

Pack	Cat. No.	Vertical Zero-U intelligent metered PDUs
		IEC 60320 standard
1	6 460 12	18 C13 outlets and 4 C19 outlets, with 3 m cord with IEC60309 16 A 2P+E plug
1	6 460 13	36 C13 outlets and 6 C19 outlets, with 3 m power supply cord with IEC 60309 32 A 2P+E plug
1	6 460 14	36 C13 outlets and 6 C19 outlets, with 3 m power supply cord with 3-phase IEC60309 16 A 3P+N+E plug
1	6 460 15	36 C13 outlets and 12 C19 outlets, with 3 m power supply cord with 3 phase IEC60309 32 A 3P+N+E plug
1	6 460 16	20 C13 outlets and 4 C19 outlets, with 3 m power supply cord with IEC60309 32 A 2P+E plug

Pack	Cat. No.	Vertical Zero-U intelligent metered and switched PDUs
	CORD LOCKING SYSTEM	**IEC 60320 standard**
1	6 460 25	16 C13 outlets with cord locking system 3 m power supply cord with C14 10 A 2P+E plug
1	6 460 22	21 C13 outlets and 3 C19 outlets with cord locking system. 3 m power supply cord with IEC 60320 16 A 2P+E plug
1	6 460 23	21 C13 outlets and 3 C19 outlets with cord locking system. 3 m power supply cord with IEC 60320 32 A 2P+E plug
1	6 460 24	21 C13 outlets and 3 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

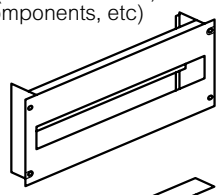
PDUs to be equipped, accessories and DIN rails

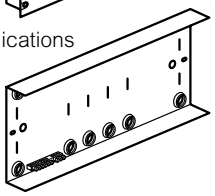
6 468 94

0 465 46 + 0 465 47

Pack	Cat. No.	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
1	6 468 94	Set of 6 locking caps for C13 outlet + 1 key
1	6 468 95	Set of 6 locking caps for C19 outlet + 1 key
		Accessories for metered PDUs
1	6 460 00	Temperature sensor
1	6 460 01	Temperature / humidity sensor
1	6 460 02	Dual contact closure sensor

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





Legrand cabling system LCS³ - copper

Performance table

		COMPONENT MEASUREMENT				LINK MEASUREMENT (CHANNEL)			
	Network protocol supported	Cat. 8 STP module	Cat. 6A STP	Cat. 6	Cat. 6 FTP module	Class I	Class EA		Class E
		2000 MHz	500 MHz	250 MHz	250 MHz	2000 MHz	500 MHz	250 MHz	250 MHz
		40 Giga	10 Giga	1 Giga	1 Giga	40 Giga	10 Giga	1 Giga	1 Giga
Attenuation (dB) Loss of signal	LCS³ Standard ISO 11801 Edition 3	1.5	0.13 0.45 max.[2]	0.06 0.32 max.[2]	0.09 0.32 max.	32.7	35.4 42.1 max.	24.1 28.9 max.	25.7 30.7 max.
Return Loss (dB) Echo resistance	LCS³ Standard ISO 11801 Edition 3	1.2	17.05 14 min.[2]	26.59 20 min.[2]	29.8 16 min	8	16.4 8 min.	22.1 10 min.	38.8 10 min.
Next (dB) Resistance to interference between pairs[1]	LCS³ Standard ISO 11801 Edition 3	12.9	37.46 37 min.[2]	56.93 46 min.[2]	51.3 46 min.	9.8	38.1 29.2 min.	54 35.3 min.	53.9 35.3 min.

1: Measurements taken on pairs, 3-6 and 4-5
2: Value taken from draft standard ISO 11801 Edition 3

PoE+ READY **Stability of performance and durability of products guaranteed provided there is a POE signal of up to 100 W**

Compliance of LCS³ systems with standards and certifications

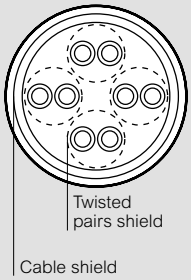
LCS³ systems and components (de-embedded) conform to the following standards:
- ANSI/TIA 568
- EN 50173-1
- ISO/IEC 11801 Edition 3 (2017)

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

New 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		Cable shielding	Shielding of twisted pairs
old name	new name		
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



Main characteristics of the LCS³ systems

	LCS³ 8	LCS³ 6A	LCS³ 6	LCS³ 5e
Frequency	2000 MHz	500 MHz	250 MHz	100 MHz
Guaranteed speed	40 Gbps	10 Gbps	1 Gbps	1 Gbps
Wiring	Copper	Copper	Copper	Copper
Connectors	RJ45	RJ45	RJ45	RJ45
Max. length of channel	30 m	100 m	100 m	100 m

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**

High-performance maintenance

GUARANTEE 25 years PERFORMANCE legrand

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

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

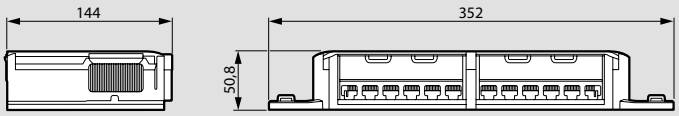
Maximum recommended lengths of links to ensure high performance of systems when using RJ 45 sockets with copper feedthroughs and/or RJ 45 sockets

	Associated lengths (m)		Links
	Cords	Cables	
Cat. 6A	8 15 20	70 60 55	78 75 75
Cat. 6	8 15 20	70 60 55	78 75 75
Cat. 5e	8 15 20	75 65 60	83 80 80

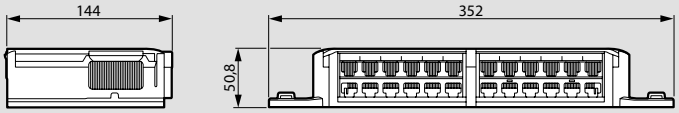
We recommend selecting the shortest cable lengths for more flexibility regarding cord length in the event of reconfiguration

Dimensions (in mm)

Cat. No. 0 337 96



Cat. No. 0 337 97



Flush-mounting Ethernet 10/100 base T switches

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

Legrand cabling system LCS³ - copper (continued)

Construction Products Regulation (CPR)

The CPR came into force on 1 July 2017, with the aim of improving building safety, especially with regard to fire safety. The CPR applies to all cables being installed:
- in private houses and apartment blocks
- in public buildings or workplaces (special-purpose public buildings, high-rise buildings)
- industrial and at-risk premises
- in civil engineering structures (road and rail tunnels, bridges, stations, etc)

The cables must comply with European requirements and be the subject of a performance declaration drawn up by the manufacturer.

Euroclasses

The CPR requires cables to be classified in one of 7 burning behaviour classes: A_{ca}, $B1_{ca}$, $B2_{ca}$, C_{ca}, D_{ca}, E_{ca} and F_{ca}.

A_{ca} : non-combustible (glass, silica, etc)
$B1_{ca}$: combustible, non-flammable
$B2_{ca}$: combustible, fire-resistant (PE, PVC, rubber, etc)
C_{ca} : combustible, fire-resistant (PE, PVC, rubber, etc)
D_{ca} : combustible, mildly flammable
E_{ca} : combustible, highly flammable
F_{ca} : not classified

Euroclass table

Cat. No.	Description	Euroclass (A_{ca}; $B1_{ca}$; $B2_{ca}$; C_{ca}; D_{ca}; E_{ca}; F_{ca})	Additional criteria (smoke production, flaming droplets, acidity)		
0 327 50	C5e U/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
0 327 51	C5e U/UTP 4P PVC CABLE	E_{ca}	-	-	-
0 327 52	C5e F/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
0 327 53	C5e F/UTP 4P PVC CABLE	E_{ca}	-	-	-
0 327 54	C6 U/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
0 327 55	C6 U/UTP 4P PVC CABLE	E_{ca}	-	-	-
0 327 56	C6 F/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
0 327 57	C6 SF/UTP 4P LSZH CABLE	**D_{ca}**	**s2**	**d2**	**a1**
0 327 58	C6 F/UTP 4P PVC CABLE	E_{ca}	-	-	-
0 327 59	C6 SF/UTP 4P PVC CABLE	E_{ca}	-	-	-
0 327 76	C6 F/UTP 2x4P LSZH CABLE	D_{ca}	s2	d2	a1
0 327 77	C7 S/FTP 4P LSZH CABLE	D_{ca}	s2	d1	a1
0 327 78	C6A F/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
0 327 79	C7 S/FTP 2X4P LSZH CABLE	D_{ca}	s2	d1	a1
0 327 88	Grade 2 F/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a2
0 327 89	Grade 3 F/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a2
0 327 98	C6A F/FTP 2X4P LSZH CABLE	D_{ca}	s2	d2	a1
0 327 99	CÂBLE C6A F/FTP 4P LSZH	D_{ca}	s2	d2	a1
0 328 50	C5e F/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
0 328 53	C5e U/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
0 328 56	C6 F/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
0 328 57	C6 F/UTP 4P PVC CABLE	E_{ca}	-	-	-
0 328 61	C6 U/UTP 4P LSZH CABLE	D_{ca}	s2	d2	a1
0 328 78	C6A F/UTP 2X4P LSZH CABLE	D_{ca}	s2	d2	a2
0 328 82	C7 S/FTP 4P LSZH CABLE	$B2_{ca}$	s1	d1	a1
0 328 83	C6A F/FTP 4P LSZH CABLE	C_{ca}	s1	d1	a1
0 328 84	C6A U/FTP 4P LSZH CABLE	C_{ca}	s1	d1	a1
0 328 85	C6A F/FTP 2X4P LSZH CABLE	C_{ca}	s1	d1	a1
0 328 86	C6 U/UTP 4P LSZH CABLE	C_{ca}	s1	d1	a1
0 328 88	C6 U/UTP 100P LSZH CABLE	E_{ca}	-	-	-
0 338 90	C7 S/FTP 4P LSZH CABLE	E_{ca}	-	-	-
0 328 91	C3 U/UTP 50P LSZH CABLE	E_{ca}	-	-	-
0 337 88	C8 S/FTP 4P LSZH CABLE	D_{ca}	s2	d2	a1

	Euroclass	Classification criteria	Additional criteria	AV CP system (Assessment and Verification of Consistent Performance)
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) EN 50399/EN 61034-2 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 performance determined	F_{ca}	EN 60332-1-2 Flame propagation	-	"4": initial type test and manufacturer's factory production controls

Applications on duplex fibre for LAN environment

Maximum distances

	OM3	OM4	OM5	OS2(1)
Gigabit	550 m	550 m	550 m	5 km
10 Gigabit	300 m	400 m	400 m	10 km
25 Gigabit	70 m	100 m	100 m	10 km
40 Gigabit	N/A	N/A	N/A	10 km
50 Gigabit	70 m(2)	100 m(2)	100 m(2)	10 km(2)
100 Gigabit	70 m(2)	100 m(2)	150 m(2)	10 km
200 Gigabit	N/A	N/A	N/A	10 km
400 Gigabit	N/A	N/A	N/A	10 km

1: Maximum attenuation 0.4 dB/km
2: Pending ratification

Technical characteristics

Pigtail

Insertion loss (IL), dB	Multimode	Singlemode
IL max. against Master. Standard	0.60	0.65
IL max. against Master. Legrand guarantee	0.25	0.25
IL max. against Random. Standard	0.75	0.75
IL typical against Random. Legrand guarantee	0.20	0.18

Multimode cable

OM5 fibre is designed for wavelength multiplexing

Type of cable	OM3	OM4	OM5
Type of fibre¹	A1a.2	A1a.3	A1a.4
Maximum attenuation at 850 nm, dB/km	3.5	3.5	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	Indoors	Outdoor
Type of fibre(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

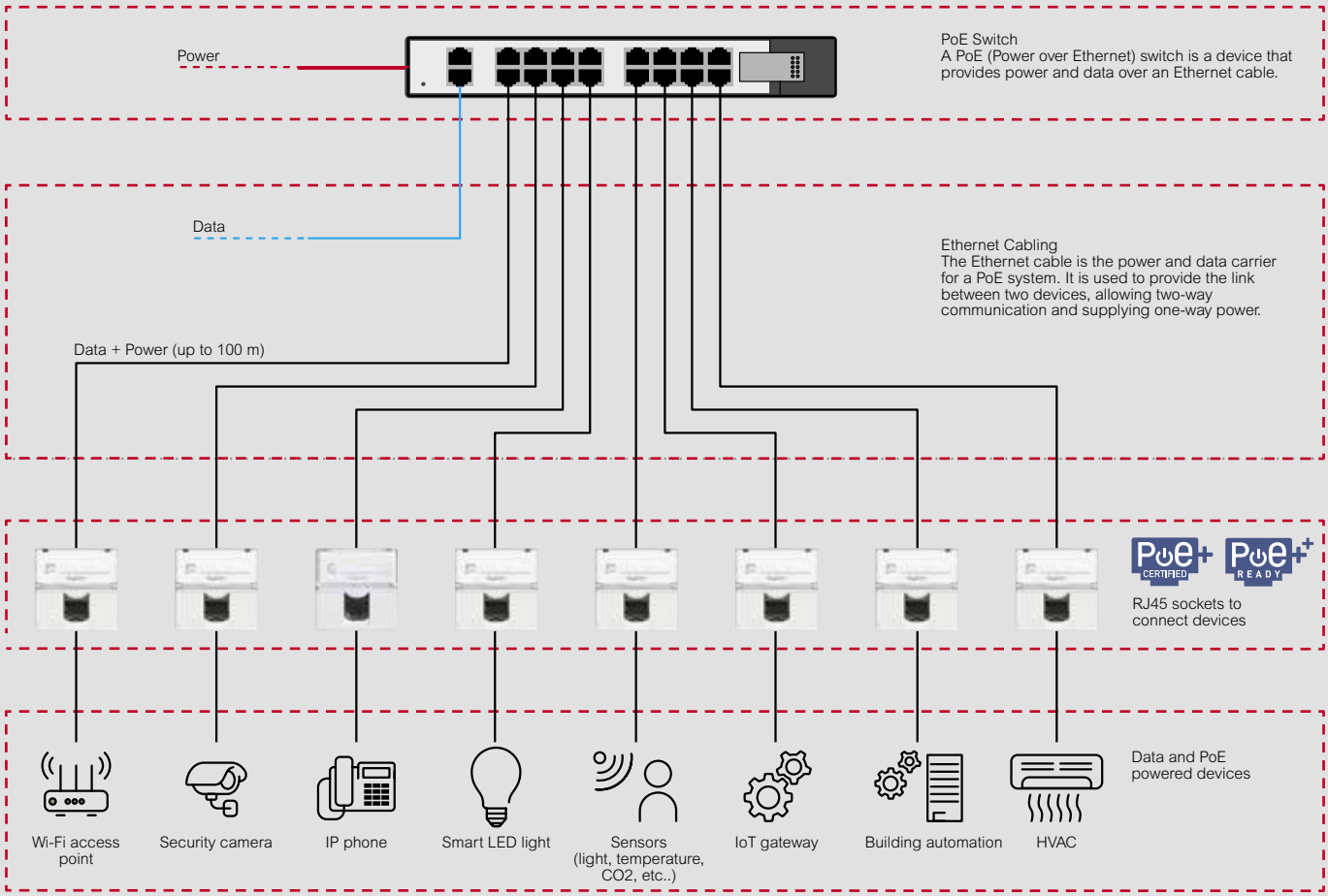
Cat. No.	Euroclass (A_{ca}; $B1_{ca}$; $B2_{ca}$; C_{ca}; D_{ca}; E_{ca}; F_{ca})	Additional criteria (smoke production, flaming droplets, acidity)		
		s1, s1a, s1b, s2, s3	d0, d1, d2	a1, a2, a3
0 325 02	D_{ca}	s2	d2	a1
0 325 03	D_{ca}	s2	d2	a1
0 325 04	D_{ca}	s2	d2	a1
0 325 05	Not applicable	-	-	-
0 325 06	D_{ca}	s2	d2	a1
0 325 07	Not applicable			
0 325 08	D_{ca}	s2	d2	a1
0 325 09	D_{ca}	s2	d2	a1
0 325 10	D_{ca}	s2	d2	a1
0 325 11	D_{ca}	s2	d2	a1
0 325 12	D_{ca}	s2	d2	a1
0 325 13	Not applicable	-	-	-
0 325 14	D_{ca}	s2	d2	a1
0 325 15	Not applicable	-	-	-
0 325 23	Not applicable	-	-	-
0 325 24	Not applicable	-	-	-
0 325 25	Not applicable	-	-	-
0 325 26	C_{ca}	s1a	d1	a1
0 325 37	D_{ca}	s2	d2	a1
0 325 38	D_{ca}	s2	d2	a1
0 325 39	D_{ca}	s2	d2	a1
0 325 40	Not applicable	-	-	-
0 325 41	Not applicable	-	-	-
0 325 42	Not applicable	-	-	-
0 325 43	D_{ca}	s2	d2	a1
0 325 44	D_{ca}	s2	d2	a1
0 325 45	D_{ca}	s2	d2	a1
0 325 46	Not applicable	-	-	-
0 325 47	Not applicable	-	-	-
0 325 48	Not applicable	-	-	-
0 325 49	C_{ca}	s1a	d1	a1
0 325 50	D_{ca}	s2	d2	a1
0 325 51	D_{ca}	s2	d2	a1
0 325 52	D_{ca}	s2	d2	a1
0 325 53	D_{ca}	s2	d2	a1
0 325 55	D_{ca}	s2	d2	a1
0 326 65	D_{ca}	s2	d2	a1
0 326 66	D_{ca}	s2	d2	a1
0 326 67	D_{ca}	s2	d2	a1
0 326 68	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

Legrand cabling system LCS³

PoE architecture

Thanks to Power over Ethernet (PoE), Ethernet cables are the only medium for supplying PoE equipment with power and data



Cabling

Cabling must be able to deliver enough power and efficiency in addition to dissipating heat.

We recommend linking each powered device with Category 6A cabling, preferably using a cabling architecture divided into zones.

Category 6A cabling:
To improve thermal performance and energy efficiency while minimising the cost of cable moves, additions, changes and upgrades.

Connectivity

Connectivity must be robust, durable and provide spare power capacity for current carrying.

Arcing is inevitable with PoE systems, but Legrand's connectivity locates the last point of contact away from the mated connection, protecting the critical area from spark gap erosion. 1.3 µm (50 microinch) gold plating of all the mated surfaces and the maximum contact area in the fully mated position extend the life and performance of the connection.

In addition, the connector should have a minimum current carrying capacity of paired traces for structured cabling of 1 Amp.

Legrand's connectivity provides up to an additional amp of power capacity for superior performance.

Reliability

If connectors are unplugged under load, an inductive current is created within the connector that may spark at one or more contact surfaces, causing the surfaces to corrode.

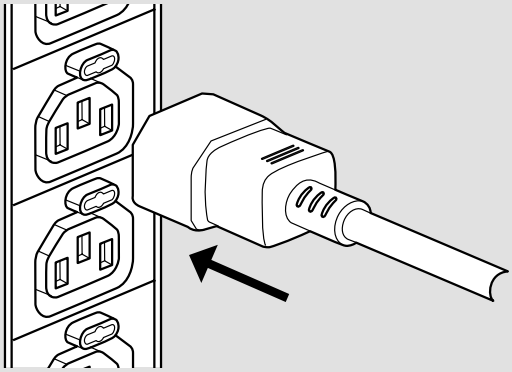
It is recommended that connecting hardware be qualified to support PoE and four-pair PoE applications by using the test schedules in IEC 60512-99-001 (PoE and PoE+) and IEC 60512-99-002 (PoE++).

Energy distribution

cord locking system

Cord locking system on C13 and C19 sockets

1



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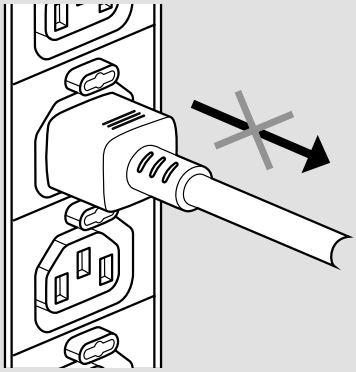
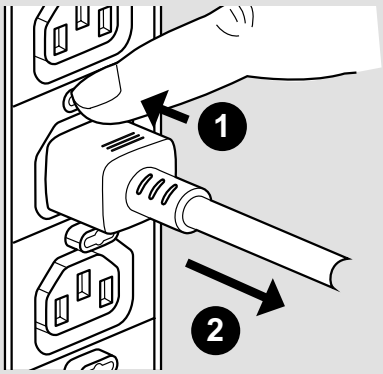


3

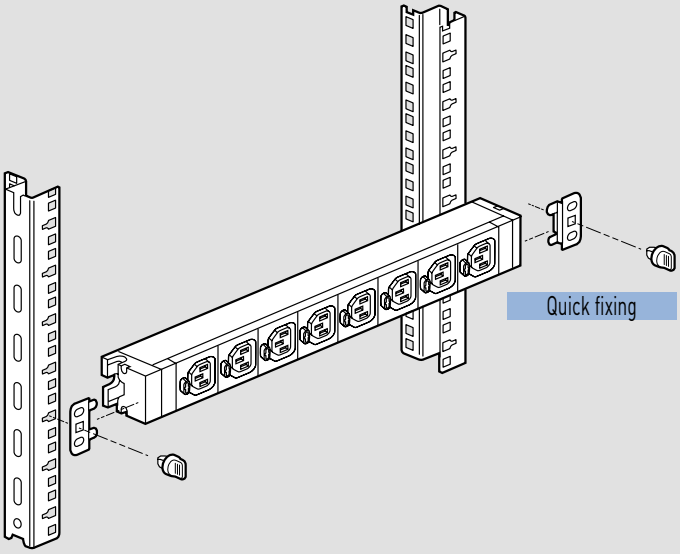


Energy distribution

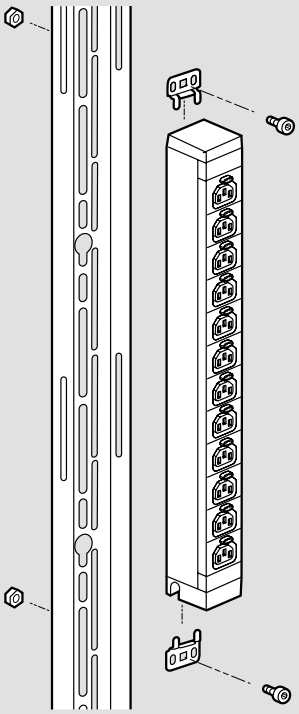
19" 1U PDU mounting

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 0 464 23



Vertical mounting in freestanding cabinets with support



Energy distribution

19" and 10" 1U PDU configurations

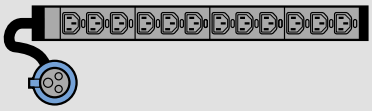
19" 1U PDU configurations

6 468 07

6 468 09

6 468 14

6 468 15

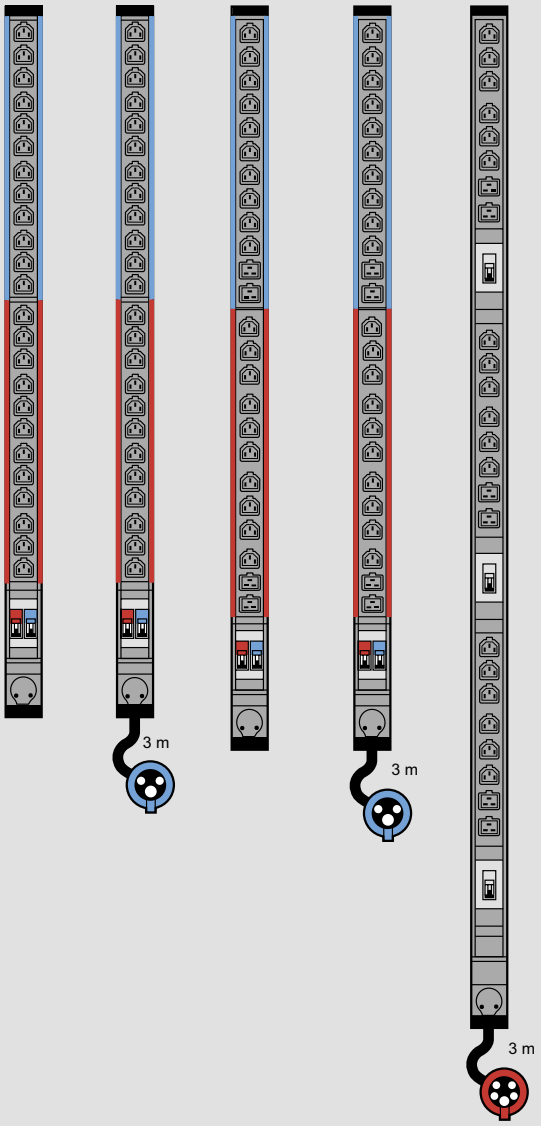


Energy distribution

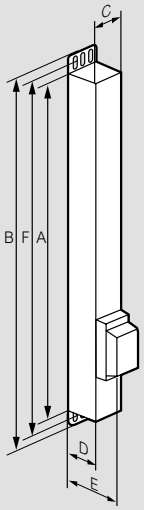
Zero-U PDUs

Zero-U PDU configurations

6 468 56 6 468 57 6 468 60 6 468 61 6 468 70



Zero-U PDU dimensions (mm)

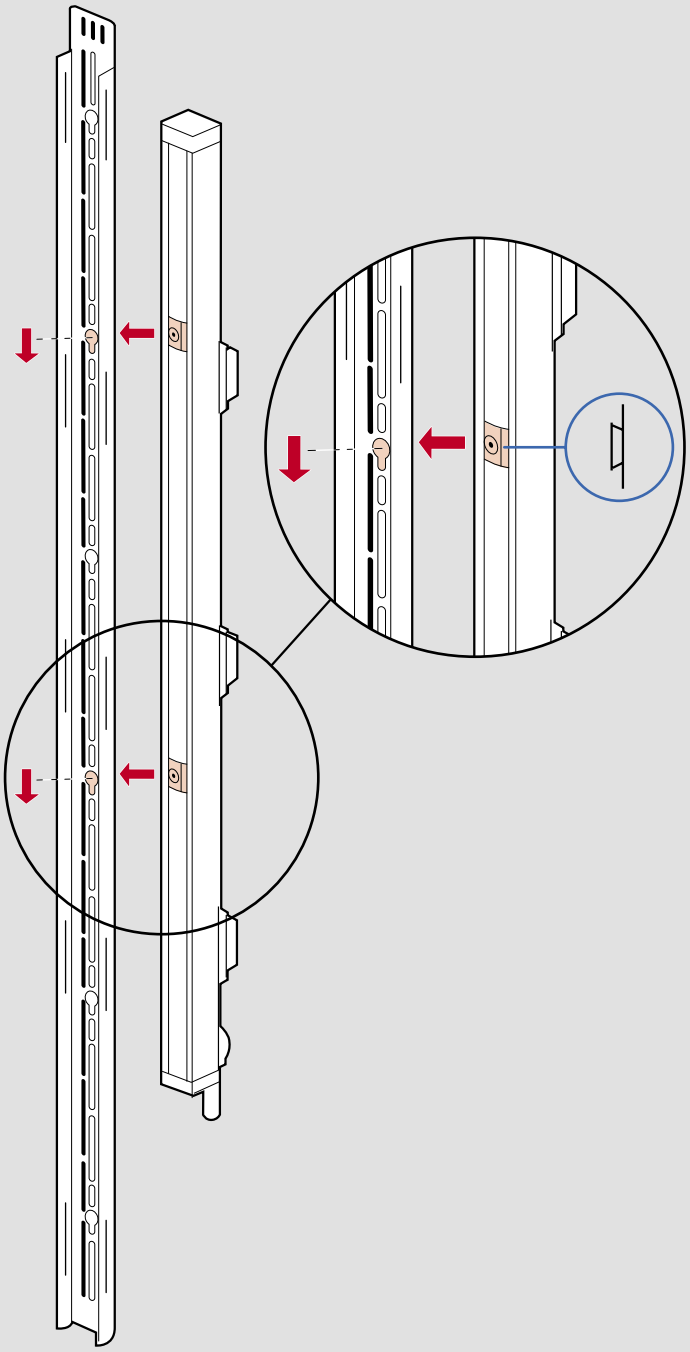


Cat. No.	Height		Width	Depth		Fixing centres (min.-max.)	
	A	B(1)	C	D	E(2)	F(1)	
6 468 50	1247	1291	52	52.5	87	1259	1279
6 468 51	1247	1291	52	52.5	87	1259	1279
6 468 52	1247	1291	52	52.5	87	1259	1279
6 468 53	1247	1291	52	52.5	87	1259	1279
6 468 54	1463	1507	52	52.5	87	1475	1495
6 468 56	1031	1075	52	52.5	87	1043	1063
6 468 57	1031	1075	52	52.5	87	1043	1063
6 468 59	1319	1363	52	52.5	87	1331	1351
6 468 60	1067	1111	52	52.5	87	1079	1099
6 468 61	1067	1111	52	52.5	87	1079	1099
6 468 70	1340	1384	52	52.5	87	1352	1372

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

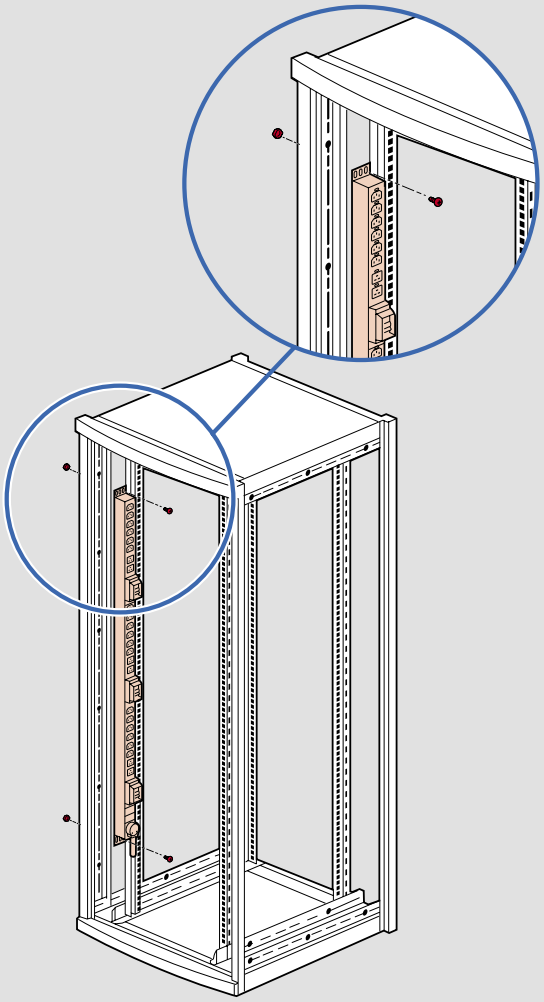
Solution with button brackets

Quick fixing without screws with support



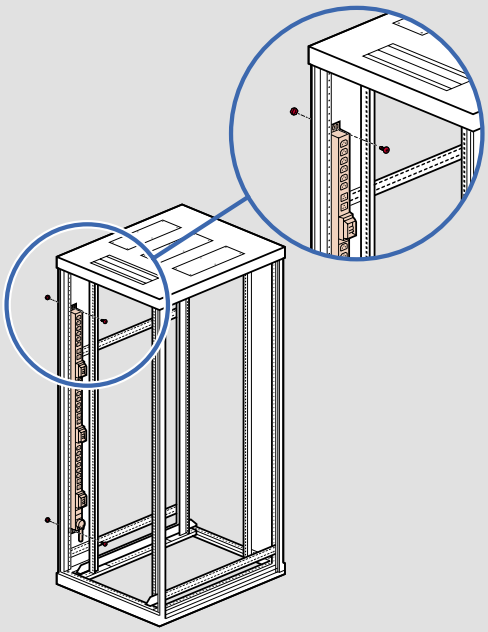
Solution with standard brackets

Screw fixing with support



Solution with LCS³ brackets

Screw fixing with support



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