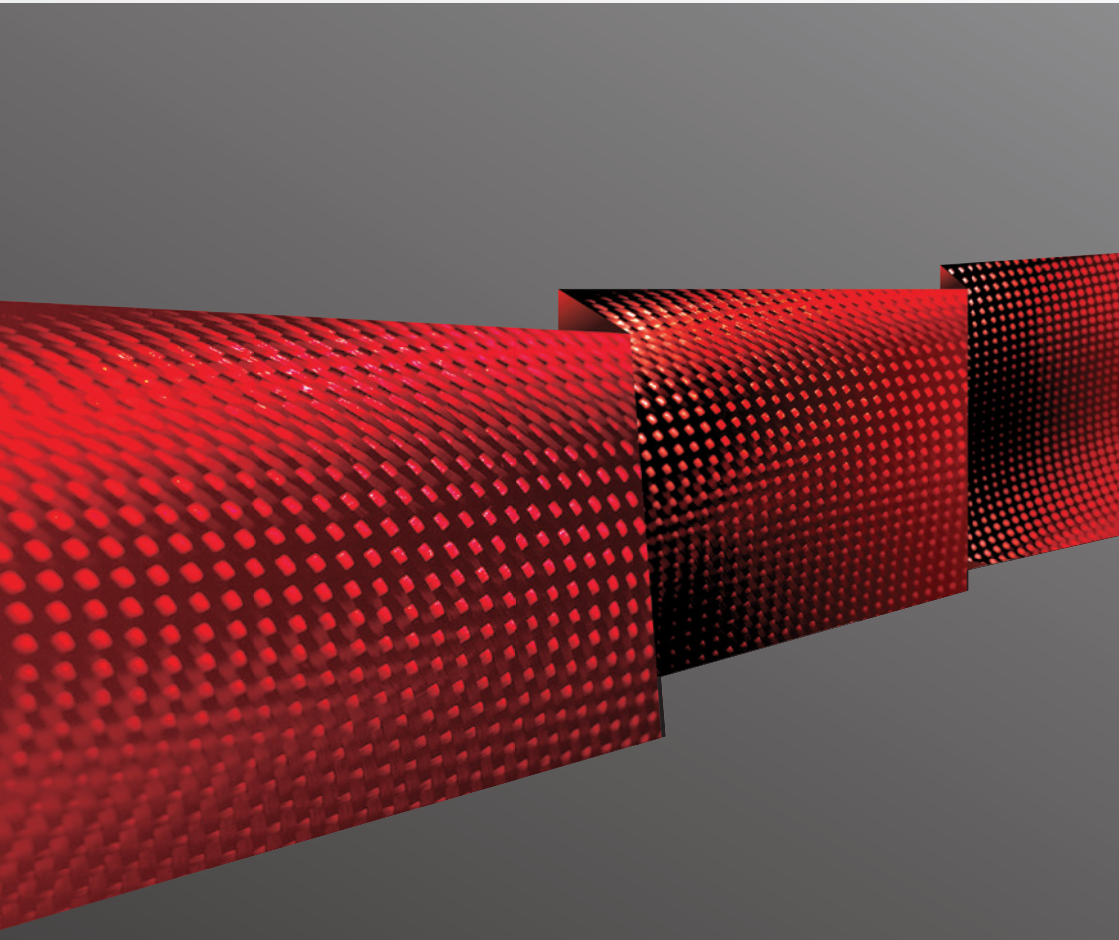
FCS

FURUKAWA CABLING SYSTEM



# ADVANCED SOLUTIONS FOR NETWORK INFRASTRUCTURE

FURUKAWA ELECTRIC GROUP

# Index

FURUKAWA ELECTRIC GROUP

The history of Furukawa Electric Group began more than 130 years ago, in Japan. Since then, the group has transformed itself into a global corporation with diversified activities with metals, light metals, telecommunications, automotive systems, energy sector, among others, forming an international network of industries operating in Asia, North America, Europe, Africa and Latin America.

It underlines its values as a company of excellence, by providing products and technologies that contribute to global development. Furukawa has more than 100 affiliates and modern research laboratories, prepared to generate new technologies and products.

# A connected world requires innovation and technology.

Through integration of all companies in Furukawa Electric Group, each one of them, market and customer oriented, we can meet society needs in all five continents.


## One Furukawa

### Global Presence

As a truly global company, Furukawa Electric Group understands how vital it is to identify and develop products and solutions, replying quickly and efficiently to customers' demands. Thus as a group, Furukawa knows there is much more to grow yet, and that there are still unknown needs to be addressed. In order to answer the oncoming need, all group companies are integrated with guided focus on markets and customers, through continuous technological innovation.

FCS

FURUKAWA CABLING SYSTEM

FCS, our Structured Cabling segment offers several products category, from twisted pair to optical technologies for an efficient network infrastructure that allows multimedia services availability in environments where it is installed.

Furukawa offers TeraLan, GigaLan Augmented, GigaLan, MultiLan, Fisaflex, Fisacesso and other product categories.

## Industrial Environment

*Industrial solution for network installation under the most adverse conditions*

## Data Center

*High-density, future-proof solutions*

## Enterprise

*Assured performance for business continuity*

## Laserway

*Passive optical networks for enterprise market*

Committed to people's quality of life, Furukawa meets this commitment by developing sustainable technologies, offering products and services that respect the way we live and encouraging actions to reduce negative environmental impacts. This all means: excellence in all phases of production process. These actions have resulted in important international recognition and certifications for Furukawa.

## Creating Complete Solutions

Furukawa focuses on expanding relationships, shortening distances and anticipating technological needs of society.

In order to do so we are always carefully monitoring movements and global trends to offer advanced solutions in infrastructure that meets the demands for high-speed and access to one of today's most valuable assets, knowledge.

# Research and Development

## Component Level Laboratory

This laboratory performs tests and analysis of products in accordance with international standards, allowing wider flexible and more efficient development process.

## Test Field

In this environment, the actual installation conditions and cable accessories are reproduced. Thus it is possible to ensure technological effectiveness and standards compliance before products are delivered to the market.

# Technology

Innovation and quality in certified and recognized products.

Structured cabling shall be designed to fulfill not only current applications but also future demand. The infrastructure can be made by optical fiber and/or twisted pair cabling.

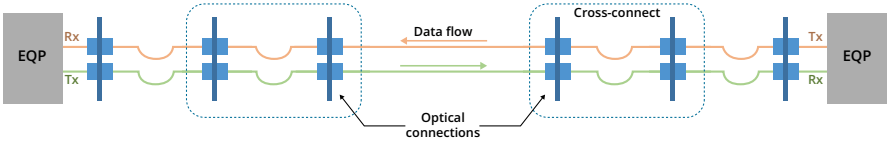
## Copper Twisted Pair

EIA/TIA 568, dated 1991, was the first American standard for structured cabling systems. In 1995, the standard was first amended and was called EIA/TIA 568 A, and in May of 2001, it was transformed into 568 B. A new revision is in force and got the nomenclature ANSI/TIA 568 C2. All these standards were based on the ISO/IEC 11801 standard, amended in 2002. The objective of these standards is to provide a flexible and reliable cabling system, able to be connected with equipment from different manufacturers. Another differential is the easy expansion of an already existing network.

| | | |
|---|---|---|
| **CAT.5e** | 100 MHz | **1 Gbps** |
| **CAT.6** | 250 MHz | **1 Gbps** |
| **CAT.6A** | 500 MHz | **10 Gbps** |
| **CAT.8** | 2000 MHz | **25 and 40 Gbps** |

## Optical Fibers

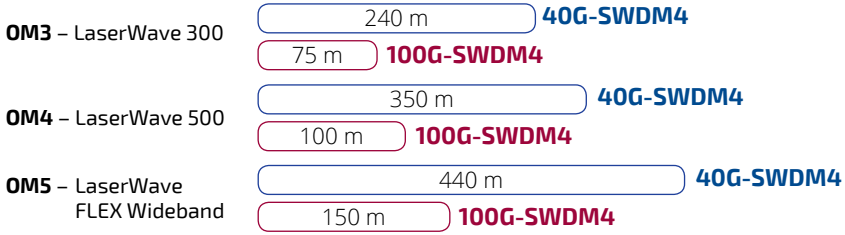
When it comes to long distance and transmission rate's performance, optical cabling is the best. It is by far, a better choice than copper cabling. Installation of optical networks follow the same rules as those for buildings, datacenter or MDUs. The optical channel presented at the figure below is an example of performance measurement for any optical solution.




Multimode Optical fibers OM1-MM(62.5/125µm) e OM2-MM(50/125µm) meet the needs of a large part of local network solutions, by delivering transmission rates of 1Gbps, as it shows below on figure 2:

| | | |
|---|---|---|
| **OM1** – MM 62.5/125 Standard | 275 m | **1 Gbps** |
| **OM2** – MM 50/125 Standard | 550 m | **1 Gbps** |

Aiming even higher transmission rates, different multimode fibers MM(50/125µm) were developed, such as OM3, OM4 and more recently OM5. These fibers are compatible with VCSEL, a semiconductor-based laser diode that allows higher taxes of transmission, within distances compatible with local networks. Among the fibers applied in critical environments or with high taxes of data transmission, OM5 should be highlighted, as it is the only one which bandwidth is characterized to be used with SWDW (Short Wavelength Division Multiplexing). The following table shows the performance of multimode optical fibers under the use of SWDM.




# OM5 Multimode Fiber

*The Wide band multimode optical fiber (WBMMF), optimized for SWDM application.*

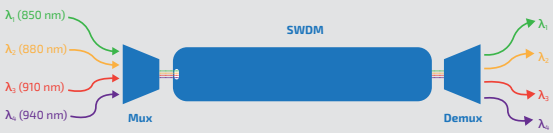
The new generation of the 50 µm multimode fibers, known as OM5, comes to enlarge the performance from previous versions, allowing data traffic in rates such as 40G/100Gbps, for now. Besides being totally compatible with current application of Multimode fibers, the new model was developed in order to support and promote the use of SWDM, which operation and use is explained and depicted as it follows:

## *SWDM TECHNOLOGY*

This technology allows data transmission through several wavelength, from 850nm up to 950nm trough one single fiber. This way, transmission capacity is multiplied by the number of different wavelengths used during transmission. Currently, there are 4 predetermined wavelengths for SWDM use.

In the following sketch, there is the representation of 4 different wavelengths going through the cable simultaneously, each one of it carrying a diverse information. In this manner, contends can travel by the mean of transmitting without suffering interference from one λ to another.

The equipment represented, Mux and Demux (transceivers), have the function of reunite and filter the existing information at the channel.




In order to establish minimum condition for performance of SWDM technology usage with multimode fibers, it is necessary to establish and determine the bandwidth necessity to transit all used wavelengths. The main differential of the OM5, when comparing with previous fibers, is this characterization.

Currently, the technology SWDM supports 4 wavelengths, that means an improvement of 4 times the transmission rate in face of conventional transmission. OM5 fiber is still under standardization phase, it is still awaiting for the creation of a norm, such as TIA-942AAAE, to stablish specifications for its specific multimode optical fibers.

# Single-Mode Fibers & Non-Zero Dispersion (NZD)

**Conventional (G.652.B)** — *Data, access networks and long distance.*

It presents excellent performance and low attenuation coefficient in transmission bands O (1260 to 1360 nm), C (1530 to 1565 nm), as well as L band (1565 to 1625 nm).

**“Low Water Peak” (G.652.D)** — *Metropolitan and access networks.*

It enables future expansion of the network for new users via CWDM in up to 16 channels. Fifty percent increase of the transmission capacity in relation to the conventional single-mode fibers. Low attenuation coefficient at the water absorption peak (1383±3 nm), assuring additional use of the E band (1360 to 1460 nm), as well as along the other transmission bands (1270 to 1610 nm).

**“Bending Loss Insensitive” (G.657.A)** — *FTTH Access networks (Fiber-To-The-Home) and local networks.*

Low values of loss, due to curvature, along its entire transmission spectrum, from 1260 to 1625 nm. It allows bending at diameters up to 20 mm generating maximum loss of 0.5 dB at 1625nm and 0.2 dB at 1550 nm.

**NZD Conventional (G.655)** — *Long distance networks and transition to metropolitan access networks.*

Optimized for operation in the range from 1525 to 1625 nm (C and L bands) in DWDM systems, as they present reduced chromatic and uniform dispersion along this operation range. They are specifically designed for expansion system with EDFA technology (“Erbium-Doped Fiber Amplifier”).

**NZD “Wideband” (G.656)** — *Long distance networks and specifically designed for expansion systems with RAMAN technology.*

Optimized for operation in the range from 1525 to 1625 nm (C and L bands) in DWDM systems, as they present reduced chromatic and uniform dispersion along it.

# Network Physical Layer Management

Almost every company has proved at least one unplanned downtime in the last year. Human failure still is the main cause for those events. Around half of the problems occurred in corporate networks were caused after some infrastructure modification. Several IT managers admit that cannot keep network documentation updated and many times don't know how many communication ports are really being used or not.

One of major worries of those professionals is how to perfectly manage and control all data and voice ports that exist in a corporate network. When talking about data center, even more protection is required. The single way of reaching this desired control level is to manage individually each data and/or voice port, from end user connection to network active equipment. And this is only possible when acting directly over physical ports connections.

Physical layer management allows getting MAC Address, that is a unique identification for certain network element, from a specific computer and where it's connected.

*This tool has for long not been considered as a simple accessory, and has become a mandatory item in several situations.*

For this management, Intelligent Infrastructure Management (IIM) tools are utilized. Due to its agility and security, this tool has become a mandatory item in several situations.

**Benefits**:

- Integration with AutoCAD (floor plan).
- Ready for copper and optical structured cabling systems.
- Electronic Work Order generation.
- Automatic update of documentation (electronic As-Built).
- Automatic detection for all TCP/IP devices in the network.
- Interacts with active equipment in the network, through SNMP protocol.
- Ready for PABX and Voice-over-IP (VoIP).
- Ready for most of market switches.
- Remote administration through WEB.
- Client for mobiles (Android).
- SMS, alert messages.
- LEDs indicator per port.
- Intelligent detection for ruptures and connection/disconnection of patch cords.
- Additional modules for visual identification of cabling racks.
- Integration with other management tools through SDIL.

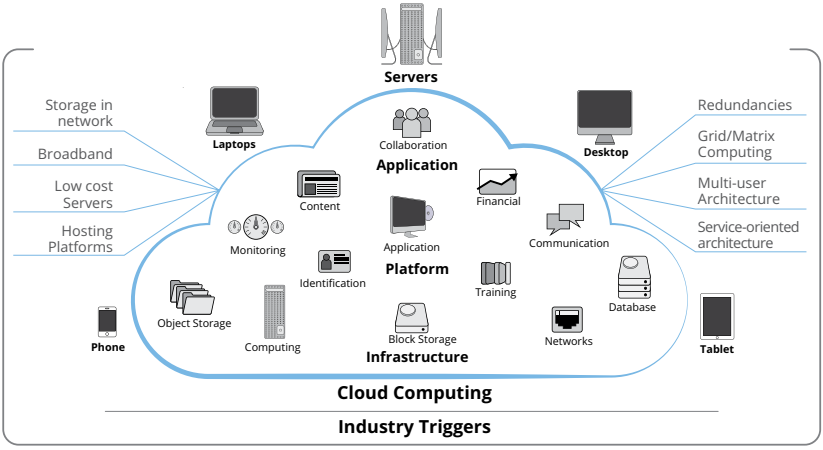
# DATA CENTER

## Security and reliability, where you need it the most.

Most of existing Data Centers have been created using decentralized approach, with sizes, which often do not exceed 180 m² and a dedicated IT team. However, this reality has been transformed due to the fast global increase of data consumption and the need to fulfill this demand at the same speed. Thus, we faced the appearance of Mega Data Centers.

The IT resources have been increasingly consolidated, once the operational efficiency of the whole data center is under its control: simplify and minimize the failure points and manage the recovery; in addition to more efficient power management by means of low power consumption and heat generation.

Another revolution we are accompanying is the impacting use of Cloud Computing. The simultaneous increase of data consumption, storage, security and hardware requirements combined with the reduction of the world costs of servers and bandwidth is driving an exponential growth either in the use or in the demand for these services.




It means that the increase in network traffic and the new era of IP devices (BYOD) are forcing the companies to invest in infrastructure. Actually, as pointed by Gartner research of september of 2017: "the market for cloud services is growing faster than virtually every other IT market today, with much of this growth coming at the expense of the traditional, noncloud offerings. IaaS is expected to show the fastest growth over the next five years."

Considering this scenario, the technological requirements for telecom systems of a Data Center are critical and, in addition to hardware, the cabling shall be able to support new technologies and future services, not only fulfilling the present demand of the network.

1. Choose a solution which offers the best benefit over time, because the physical construction of a Data Center is done only once;
2. Study the products performance in advance, whether they have certifications from independent laboratories and their compatibility with other accessories and equipment in the network.
3. Be sure that the selected technology is stipulated by standard, in order to be well informed in case of changes in the performance parameters.

*Whichever application is used in your Data Center, Furukawa has the right solution for you.*

Check out the advantages of Furukawa's quality in the ITMAX solution for Data Center:

- **High Availability**: Communication channels tested in factory to assure full availability in different topologies, and proven by means of third party's laboratories – which reduces any potential points of failure and minimizes the risks of downtime.
- **Modularity**: It is possible to expand optical networks without the need of splices and with high density, reducing the time of installation and the possibility of communication failure.
- **Performance**: Systems that guarantee transmission with Zero Bit Error are essential - CAT.6, CAT.6A - and Optical Links, which fulfill 10 G and the trends for future migration to 40/100 Gbps.
- **Physical Layer Management**: This system assures the automatic update of the documentation in the cross-connection areas of network, and facilitates physical localization of the devices connected in the network, making infrastructure management more agile and secure.
- **Security**: By means of implementation of a physical layer management system, it is possible to manage the physical point of the network and map it in a software platform, so that the IT Manager can be sure of what is interconnected. Any non-authorized movement in the patch panels and/or the optical distributors will generate alarms, and the IT team will be able to identify the failures instantly.
- **High Density**: Solutions that enable expansions for fast fulfillment of future demands and which do not compromise the performance of the communication channels, with no need of physical expansion, valuing the square meter of Data Center.
- **Operational Efficiency**: Cabling infrastructure designed to take maximum benefits from the civil project, refrigeration and power systems (open racks, cabling accessories adequate for the layout – hot and cold corridors, etc.).

## Understand how a Data Center is structured:

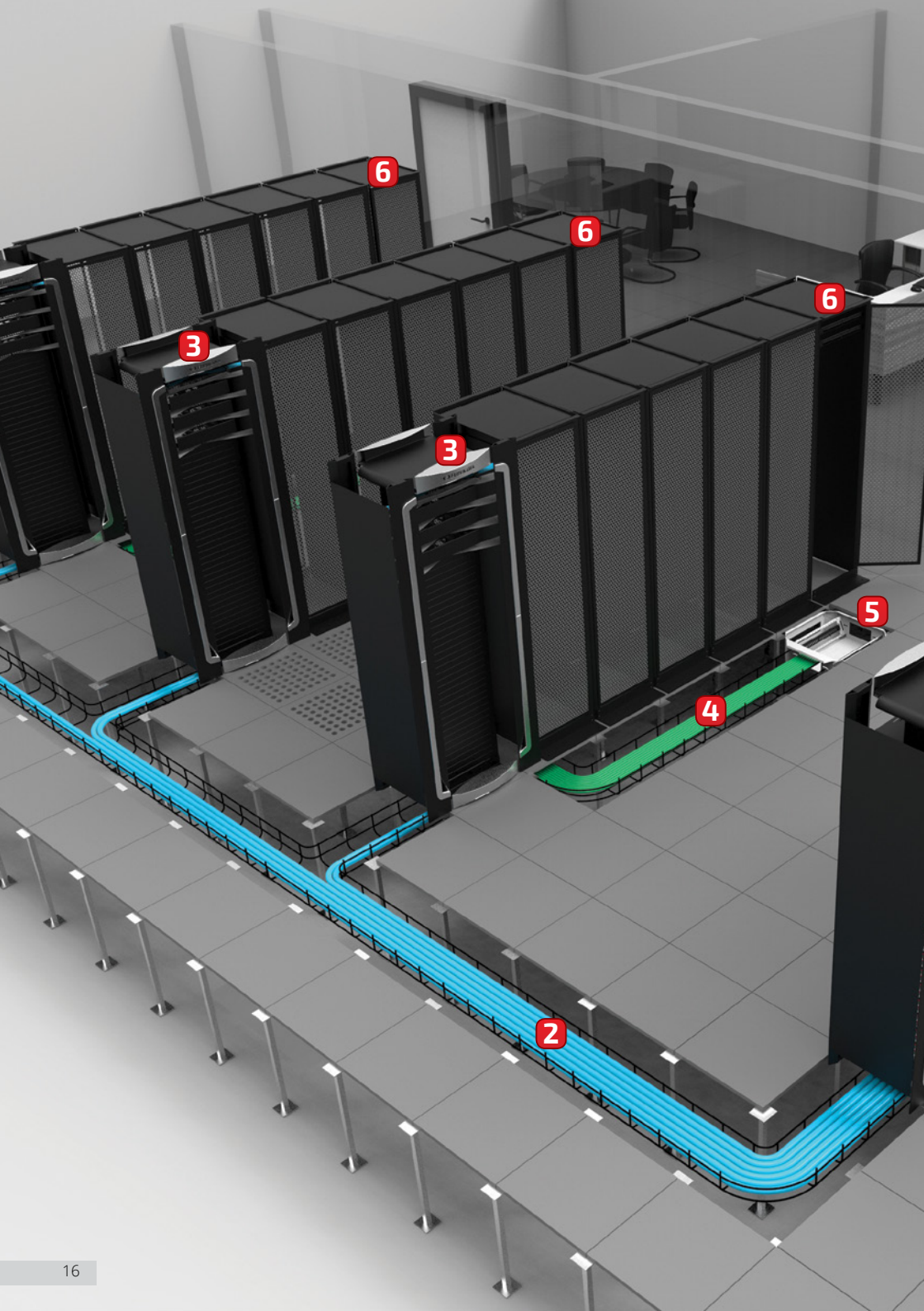
- **Entrance Room (ER)**
  The Entrance Room is a space for interconnection between the structured cabling of the Data Center and the cabling coming from telecommunication operators.
- **Main Distribution Area (MDA)**
  It includes the main cross-connect, which is a main point of distribution of the structured cabling of a Data Center. This is a critical area, where the main maneuvers of the Data Center are carried out.
- **Horizontal Distribution Area (HDA)**
  This is an area used for connection with the equipment areas. It includes horizontal cross-connect (HC) and intermediary equipment.
- **Zone Distribution Area (ZDA)**
  Point of optional interconnection of the horizontal cabling. Placed between HDA and EDA, it enables fast and frequent configuration, generally placed under the floor. It aggregates flexibility to the Data Center.
- **Equipment Distribution Area (EDA)**
  A space designated for terminal equipment (Servers, Storage) and the data or voice communication equipment (switches).

## Rules to classify a Data Center:

According to the TIA-942-A standard, there are a series of applicable rules for the classification of a Data Center called ratings. The rating considers 4 independent levels for the Telecommunications, Electric, Architecture and Mechanical systems. These levels are related to the availability of the Data Center and can be different in each of the areas mentioned above.
For the general rating, the lowest level is always considered.
Ex. $T_2E_3A_1M_2$ is rated as: Level 1

**Data Center**

| | | |
|---|---|---|
| I | Data Center: | Basic |
| II | Data Center: | Redundant Components |
| III | Data Center: | Concurrently Maintainable |
| IV | Data Center: | Fault Tolerant |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6
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2

# DATA CENTER

# INDUSTRIAL ENVIRONMENT

## Protection and resistance for connections.

Developed to allow installation of network points under the most diverse conditions, the Protection Index of Furukawa Industrial Solution products is class IP 67, which guarantees full protection against dust, strong waterjets and temporary immersion.

All network environments suffer from dust, but in certain places, its concentration is critical and may damage the connection at the exposed network point or even lose the signal completely.

The same happens with humidity, which is invisible at first and may cause major damages.

The main failures identified on common cabling installed in critical environments are presented below:

- **Failure due to Hygroscopic Dust**: Suspended solid materials may deposit on the printed circuit board surface or on the contacts, isolating the connection between the intervals of two conductors.
- **Oxidation**: High humidity damages the contacts and causes several kinds of corrosion, which may lead to system failures.
- **Fatigue**: With the presence of particles in the contact areas, the precious metal layers may deteriorate during the connectorization processes.
- **Vibration**: Environments with vibration may damage the connectors' contacts, causing loss of communication signals.

Check below the comparison between environments:

| | **Commercial Office** | **Industrial Environments** |
|---|---|---|
| **Temperature** | Controlled | Variable |
| **Chemical Compounds** | Lack of oil, grease or other chemical compounds | Presence of oil, grease or other chemical compounds |
| **Cleaning products** | Non-aggressive | Aggressive |
| **Vibrations** | Without vibrations | With vibrations, shocks |
| **Access** | Easy access to the telecom infrastructure (if planned) | Often, difficult access to the telecom infrastructure |
| **Automation/Software** | Automated systems, process-aimed software (business), possible "false" stops are recoverable by the SWs, databases or by the user without big consequences. | Automated systems for production system control and drives production records. Communication failures bring reprocesses, scrap, loss and risk to people's life. |

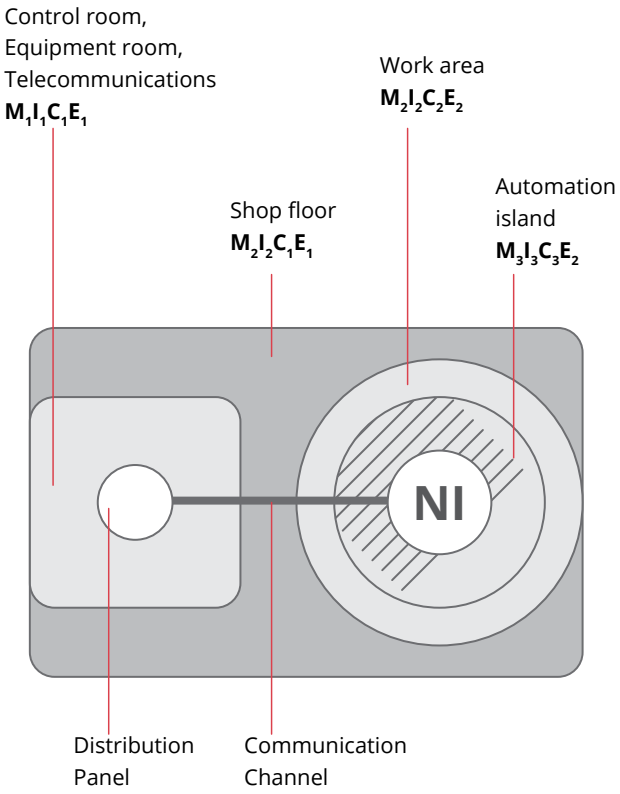
The standard adopted in the norm creates **3 levels of hostility of the industrial environments** (MICE standard), considering that the 4 reference parameters are described below:

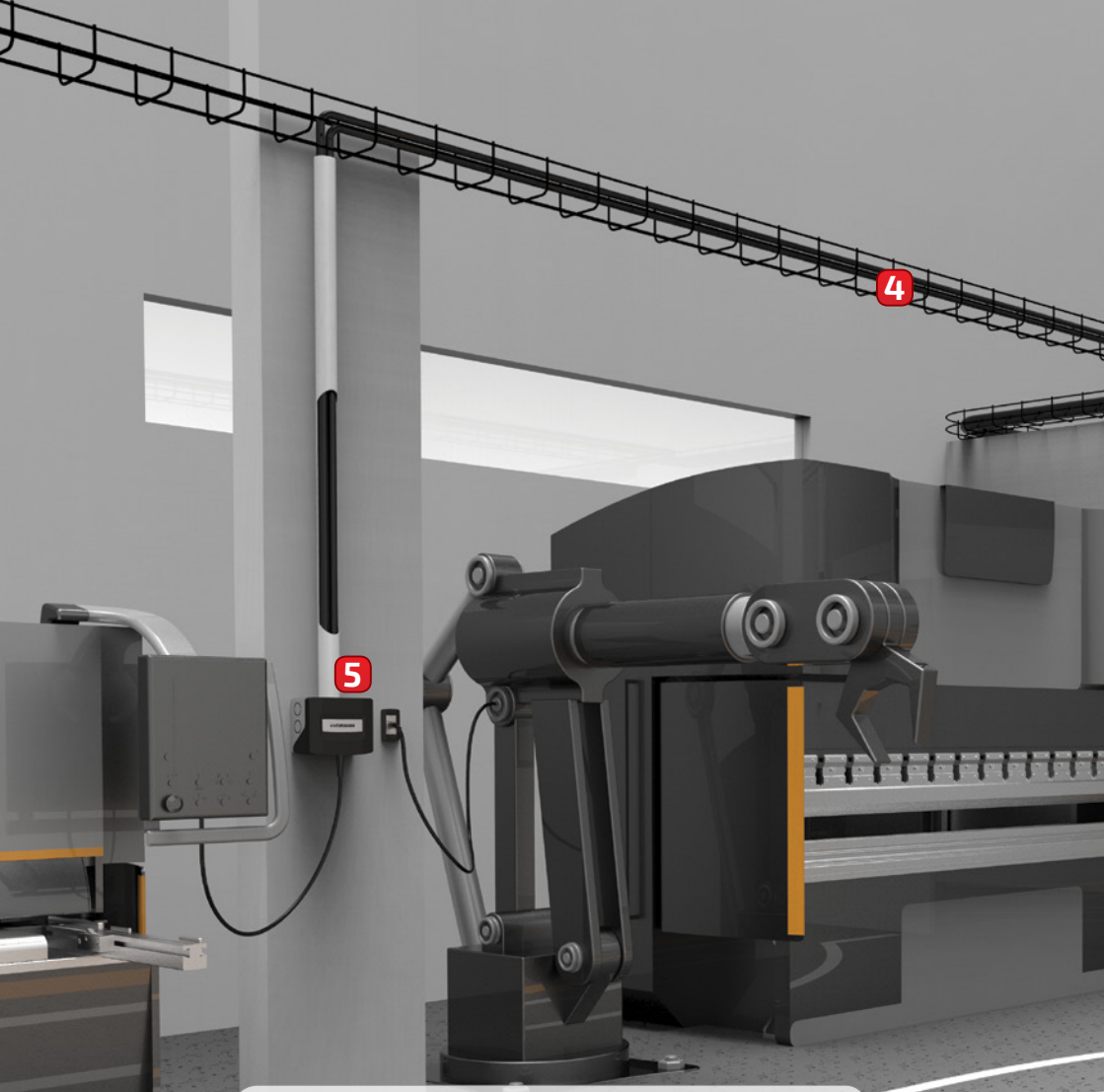
**M** **Mechanical** (Impact, vibration, tension, torsion, etc.)

**I** **Ingress** (Solid and liquid particles)

**C** **Climatic and Chemical** (Temperature, humidity, solar radiation, chemical products, etc.)

**E** **Electro-Magnetic Interference** (Contact and arc discharge, radio frequency, line voltage, induction, etc.)






## 1 Equipment Room

| | | Pg. |
|---|---|---|
| Racks | Rack ITMAX | 138 |
| Optical Distribution Frames | Vertical Cable Manager | 140 |
| Patch Panels | Server Cabinet | 136 |
| | A270 ODF | 42 |
| | Shielded Angled Patch Panel ½U | 149 |
| | Optical Cords | 67 |
| | Shielded CAT.6A Keystone Jack | 74 |
| | Shielded CAT.6A Patch Cord | 72 |

## 2 Backbone

| | | |
|---|---|---|
| Trunk Cables | Shielded Data Cable GigaLan CAT.6A F/UTP | 71 |
| Anti-rodent Optical Cable | Optical Cable Optic Lan (PFV) | 164 |
| Shielded Electronic Cables | Industrial Trunk Cable IP67 | 55 |

# INDUSTRIAL

# ENTERPRISE

## Integrated systems in a single cabling.

Corporate buildings cabling were constituted by several kinds of cables mutually incompatible, and each of them was adequate only for one specific application, such as: transmission of voice, data, images, automation and control system, security systems, etc.

Dedicated cabling, proprietary systems, centralized processing and new structured cabling technologies made manufacturers and international entities develop norms and standards for the sector, looking for adequacy to the new and future applications.

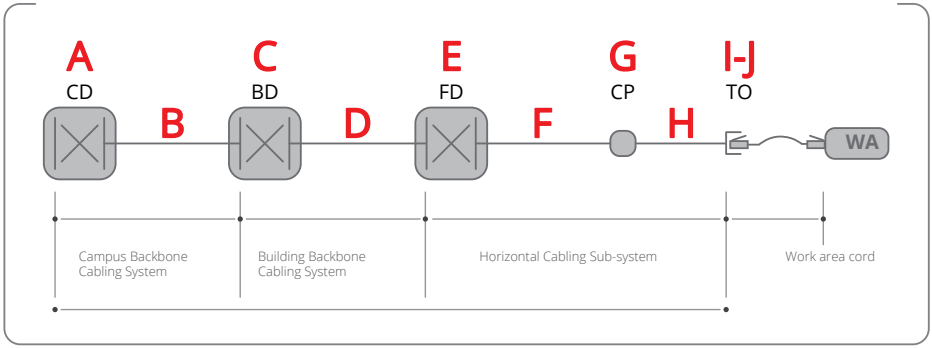
The international standards, such as TIA 568C and its addendums set forth electrical and mechanical requirements for the components in the whole infrastructure.

In order to implement an appropriate cabling system in a commercial building, it is very important to analyze the integration of the systems and the definition of the routes. The earlier the initial planning is done, the bigger the flexibility and the service life of systems will be.

In order to choose the best technology to be installed, it is necessary to analyze the current offered services and future expansions, selecting between optic, copper or mixed cabling (optical + copper).

The cabling systems in corporate buildings are composed of up to three sub-systems: campus backbone, building backbone and horizontal cabling. The sub-systems are interconnected to form a cabling system as the structure illustrated below.

## Generic Cabling Sub-System




Structured cabling in corporate buildings according to the TIA-568-C standard.

## The structured cabling elements are:

A) Campus Distributor (CD);

B) Campus Backbone;

C) Building Distributor (BD);

D) Building Backbone;

E) Floor Distributor (FD);

F) Horizontal Cabling;

G) Consolidation Point (CP);

H) Consolidation Point Cable (CP Cable);

I) Multi-user Telecommunication Outlet Assembly (MUTOA);

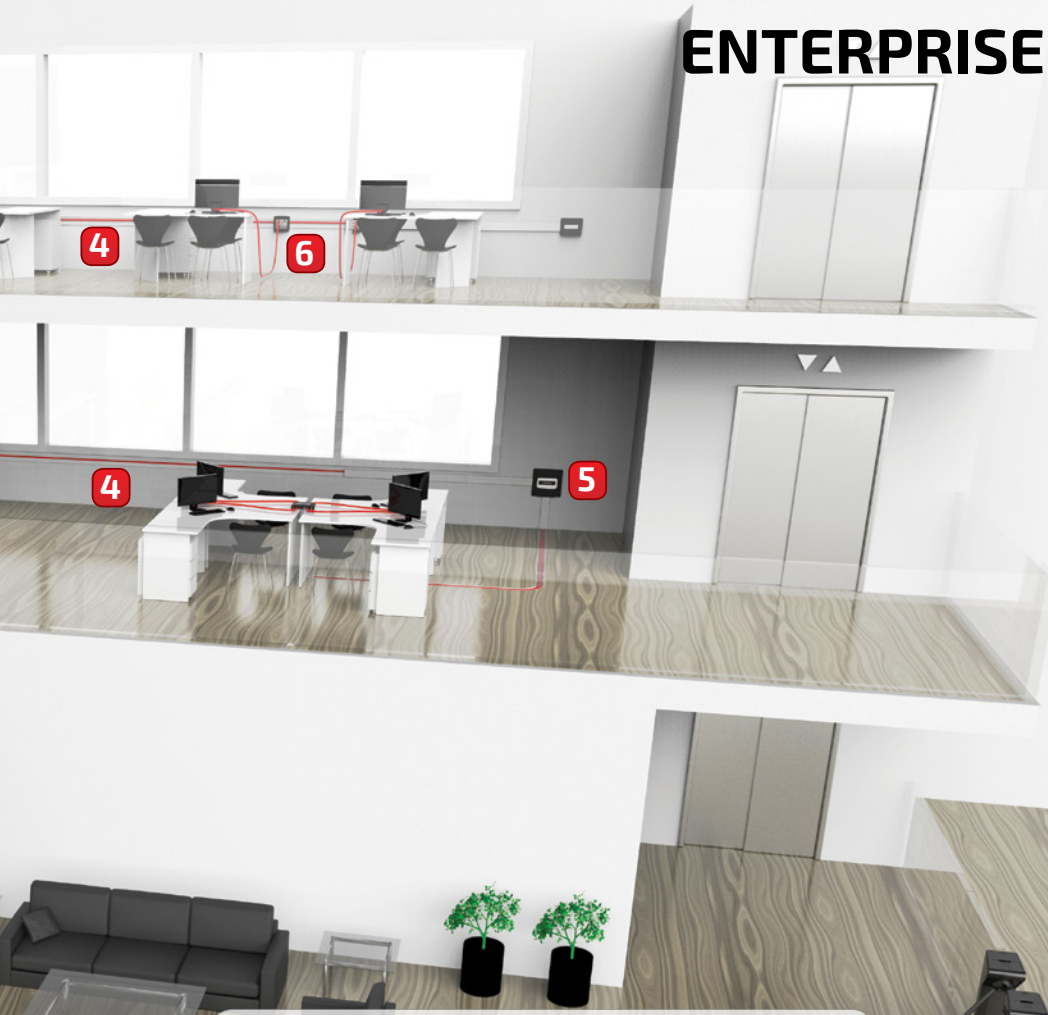
J) Telecommunication Outlet (TO);

## Structured cabling benefits:

- *Flexibility for layout changes and possibility to include new systems upon demand;*
- *Intercommunication between different systems, generating additional features;*
- *Network systems based on protocols that allows remote management;*
- *Cabling standardization and performance assurance.*


| 1 Equipment Room | | Pg. |
|---|---|---|
| Open Racks | Open Rack 19" | 142 |
| Optical Distribution Frames | Accessories for Open Racks | 142 |
| Optical Patch Cords | LGX Optical Distribution Frame | 40 |
| | Optical Patch Cords | 56 |
| **2 Backbone** | | |
| Optical Cables | Optical FiberLan LSZH Cable | 161 |
| Pre-Terminated Optical Cables | 12F Trunk Cables | 52 |
| Copper Cables | Data Cable GigaLan CAT.6 U/UTP CMR | 95 |
| **3 Telecommunication Room** | | |
| Cabinets | Cabinet 19" | 134 |
| | Accessories for Cabinets | 135 |
| Patch Panels | Unloaded Shielded Patch Panel 24P | 150 |
| Patch Cords | CAT.6 Copper Patch Cord | 97 |
| Optical Distribution Frames | LGX Optical Distribution Frame | 40 |
| Optical Patch Cords | Optical Patch Cords | 56 |

# ENTERPRISE




| | | Pg. |
|---|---|---|
| **4 Horizontal Cabling** | | |
| Copper Cables | GigaLan CAT.6 U/UTP CM Cable | 95 |
| | GigaLan CAT.6 U/UTP LSZH Cable | 95 |
| **5 Consolidation Point** | | |
| Consolidation Points | Shielded 12P Consolidation Point | 151 |
| | Stackable 24P Consolidation Point | 151 |
| **6 Work Area** | | |
| Keystone Jacks | Surface Mount Box | 156 |
| Patch Cords | Modular Faceplates 4x2, 4x4 and its Modules | 155 |
| | CAT.6 Keystone Jack | 99 |
| | CAT.6 Copper Patch Cord | 97 |

# LASERWAY

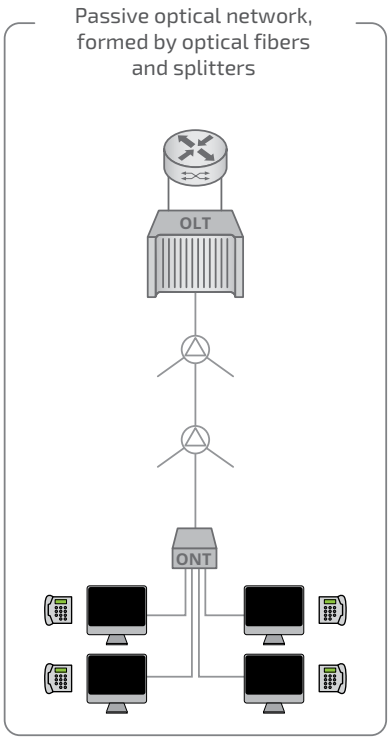
## Cost effective, control and convergence.

Furukawa's Laserway solution was created to serve Enterprise market segment with an innovative solution of Local Area Network (LAN) infrastructure. The solution is based on the GPON (Gigabit Passive Optical Network) technology, which is conceptually a network based on single-mode fibers with point-multi-point topology, considering that between one single network aggregation equipment (Core) and all the equipment in the work areas, there are only passive optical elements.

In the Laserway solution, the data transmission occurs between the equipment called OLT (Optical Line Termination), located in the equipment room and the ONT (Optical Network Termination), located in work areas. ONTs provide connectivity with copper patch cords to any final devices 10/100/1000 BaseT Ethernet of the network, such as, computers, IP telephones, access points, printers, IP surveillance cameras, automation systems, access control, etc. In addition to the connectivity with IP equipment, services, such as analogue telephony and analogue video may also be offered.

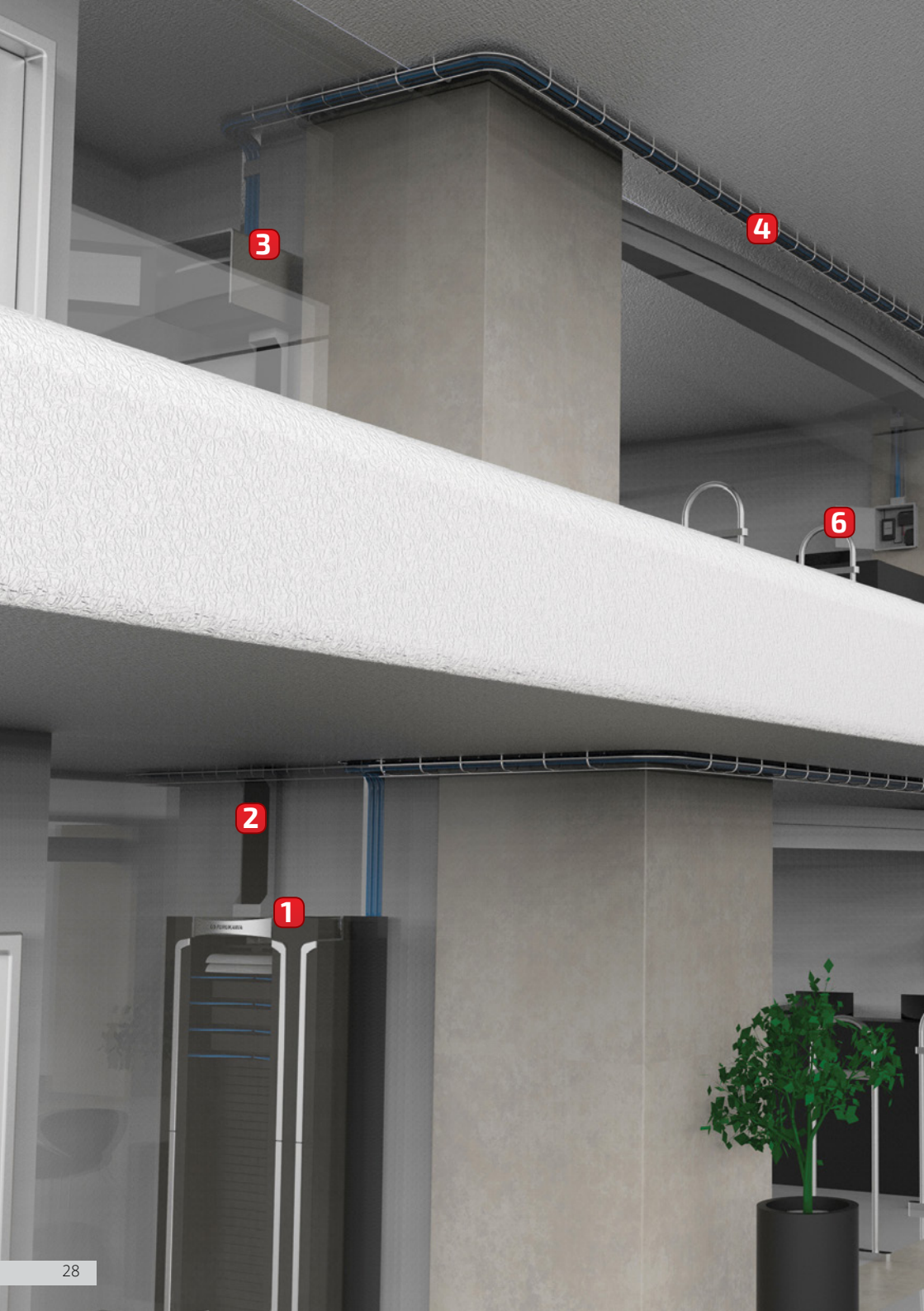
Between OLT and ONTs, there is the optical distribution network ODN (Optical Distribution Network).

In this network, there are single-mode fibers and optical splitters, which are just signal dividers. The splitters are passive equipment, i.e., they do not require any power or cooling, and their function is to split the input – optical signal coming from an OLT – in multiple outputs for fibers connected to the ONTs in the work areas.



## Benefits from this solution:

- **Simplified Infrastructure**: reduction of technical rooms, electric trays and ducts due to the fact that each fiber can distribute different users' information to each optic OLT port.
- **Reduction in Energy Consumption**: due to the reduction of number of necessary technical rooms in the local network, it reduces the need for power and cooling equipment in these rooms. In addition to this fact, the equipment in the Laserway solution present low energy consumption as they transmit data through optical means.
- **Better Band Control**: as in the Laserway solution, the OLT and ONTs are located only at the terminals of the optical network, the control of the band used in each ONTs becomes easy. This characteristic of having one equipment that centralizes the traffic commutation in one central point of the network perfectly fits the traffic profile of the current local networks.
- **Future-proof Network**: Laserway distribution network solution, formed of optical fiber, splitters and optical accessories, has transmission capacity in TeraBps (Terabits per second). It is known that the active equipment have significant increase of their data transmission rates over time. The infrastructure of the solution implemented nowadays would be ready to support such rates.
- **Network for Green Buildings**: many of the features of the Laserway ONTs are essential to serve the programs for encouraging the use of efficient resources, because they contribute with the reduction of energy consumption, cooling systems and quantity of material used for cabling.
- **Investment Savings**: Laserway ONTs equipment brings important reduction in the CAPEX (material cost) and OPEX (operational cost) investments.
    - CAPEX: with significant reduction of the space occupation – each equipment port can attend up to 64 different services; smaller technical rooms can be provided without exclusive infrastructure for air conditioning systems, stabilized energy and peripheral equipment. In extreme cases, these may be reduced to one optic cabinet.
    - OPEX: the network operation and maintenance are simplified due to the smaller technical rooms, less assets and consequently less quantity of points of failure, control of all served points from one equipment unit only. However, the biggest impact is the reduction of energy consumption, which may reach 70%.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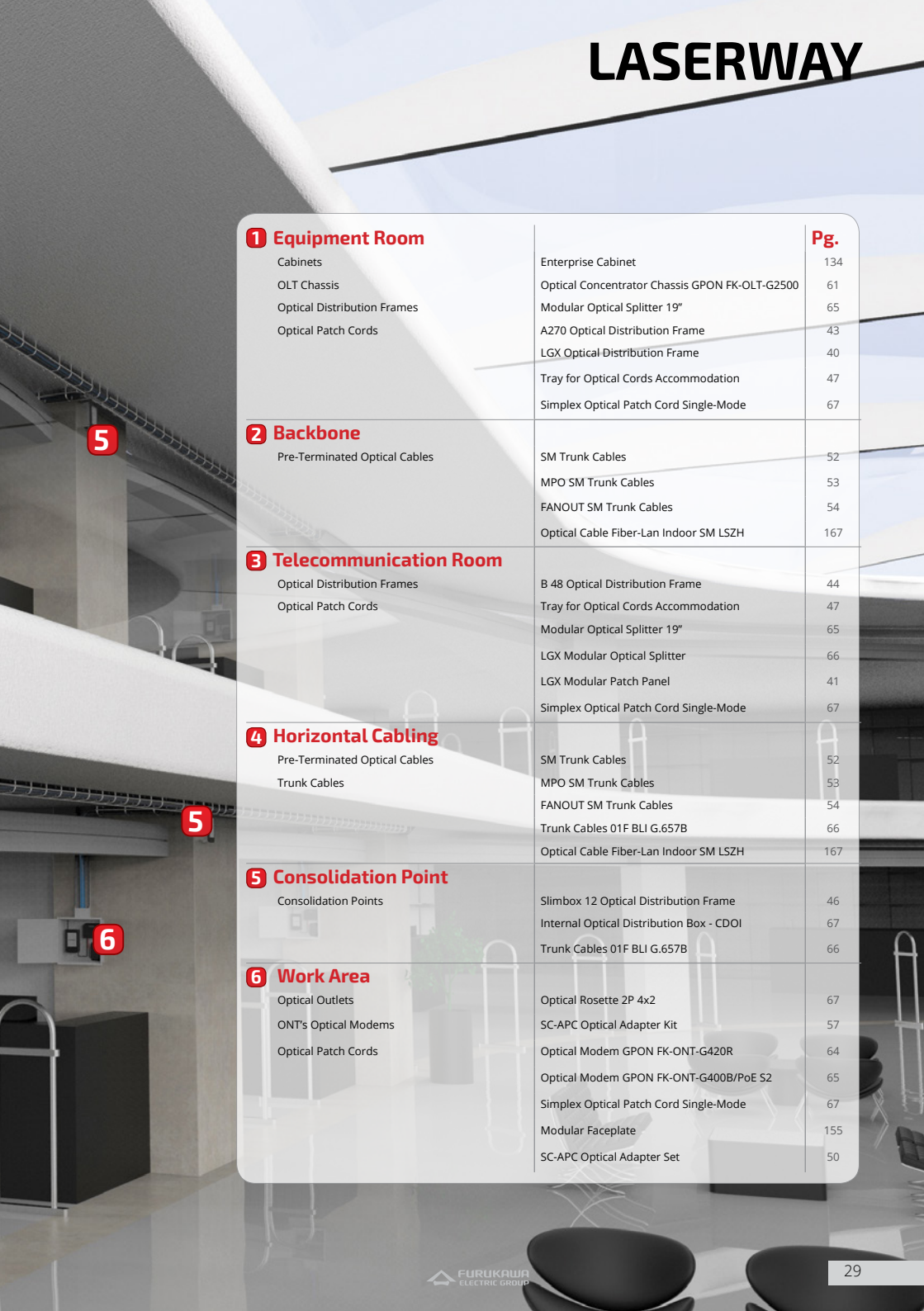
# LASERWAY



# Product Category

Technical Data.

*Data transmission experience.*

Furukawa strongly invests in big diversity of products aimed at high speed through optic fibers, in order to fulfill the most diverse needs. The attention to quality control is present in the whole production process, with the constant objective to exceed the standards, going beyond.

## TERALAN - Optic Category

Transmission rates at the speed of light.

TeraLan is the category of optical cords and accessories designed to transmit high data rates, providing an end-to-end solution suitable for high occupation of optical fibers. TeraLan offers simplified management, installation and operation.

## GIGALAN AUGMENTED - Category 6A

10 Gb in 100 meters, without interference.

The products that compose the CAT.6A channel have unique design characteristics, which minimize any interference affecting the data traffic, especially in Data Center.

## GIGALAN - Category 6

Security and guarantee in various environments.

The products from the GigaLan category offer high performance in structured systems for voice, data and image transmission, which require guarantee of support for future expansions. Performance is guaranteed for a channel with up to 6 connections and 100 meters.

## MULTILAN - Category 5e

The simplest connection between you and the world.

The MultiLan product category is recommended for installations which require Fast-Ethernet transmission (100 Mbps) or Ethernet Gigabit (1000 Mbps) maximum, fulfilling the current demands for Category 5e services and applications.

## FISAFLEX - Data and Voice

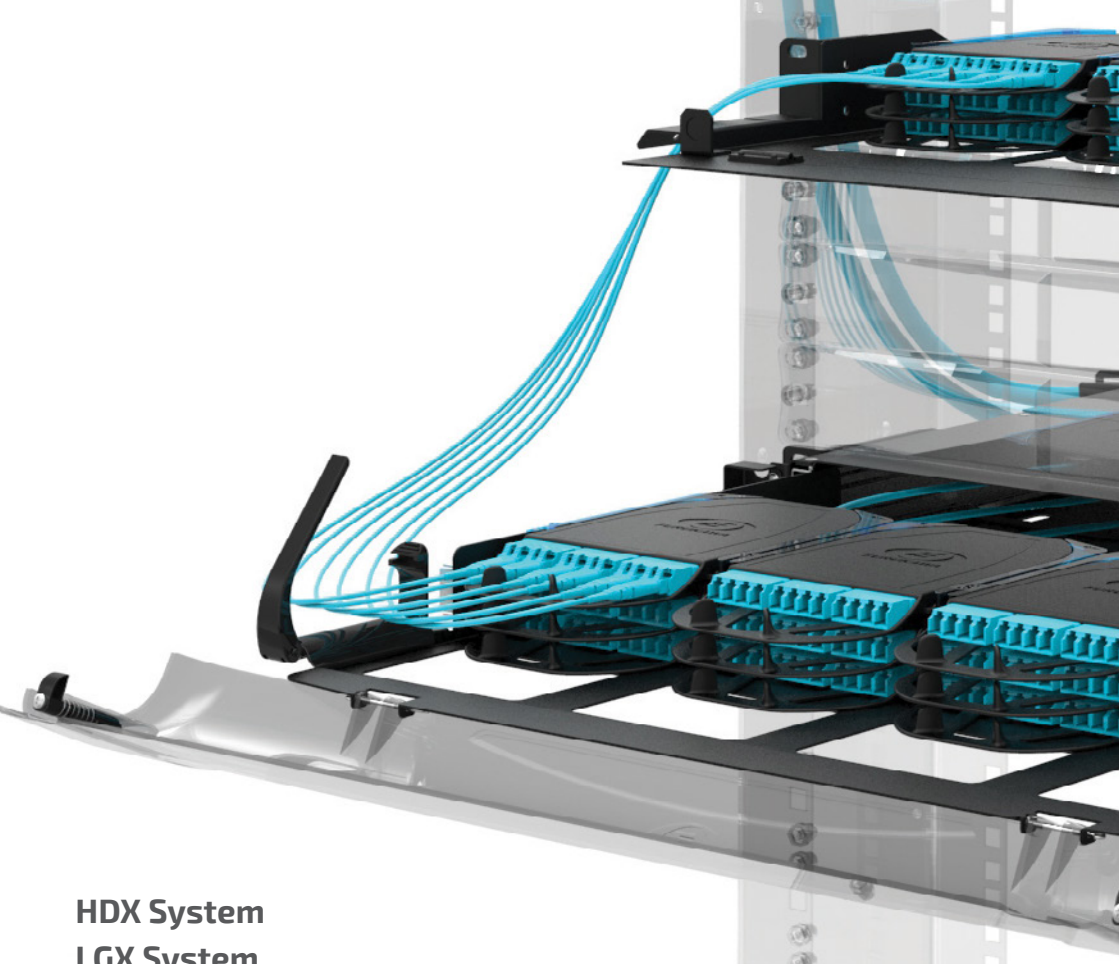
Data and voice in a single space.

The Fisaflex category offers Category 3, 5e and 6 products, whose application can be voice or data oriented, with the same performances assured in the structured cabling standards, using the 110IDC connection systems.

## FISACESSO - Infrastructure

Tailored accessories for fast and secure installation.

The Fisacesso products guarantee correct installation of cables, outlets and patch cords, according to cabling standards, always keeping the best performance of the network infrastructure.

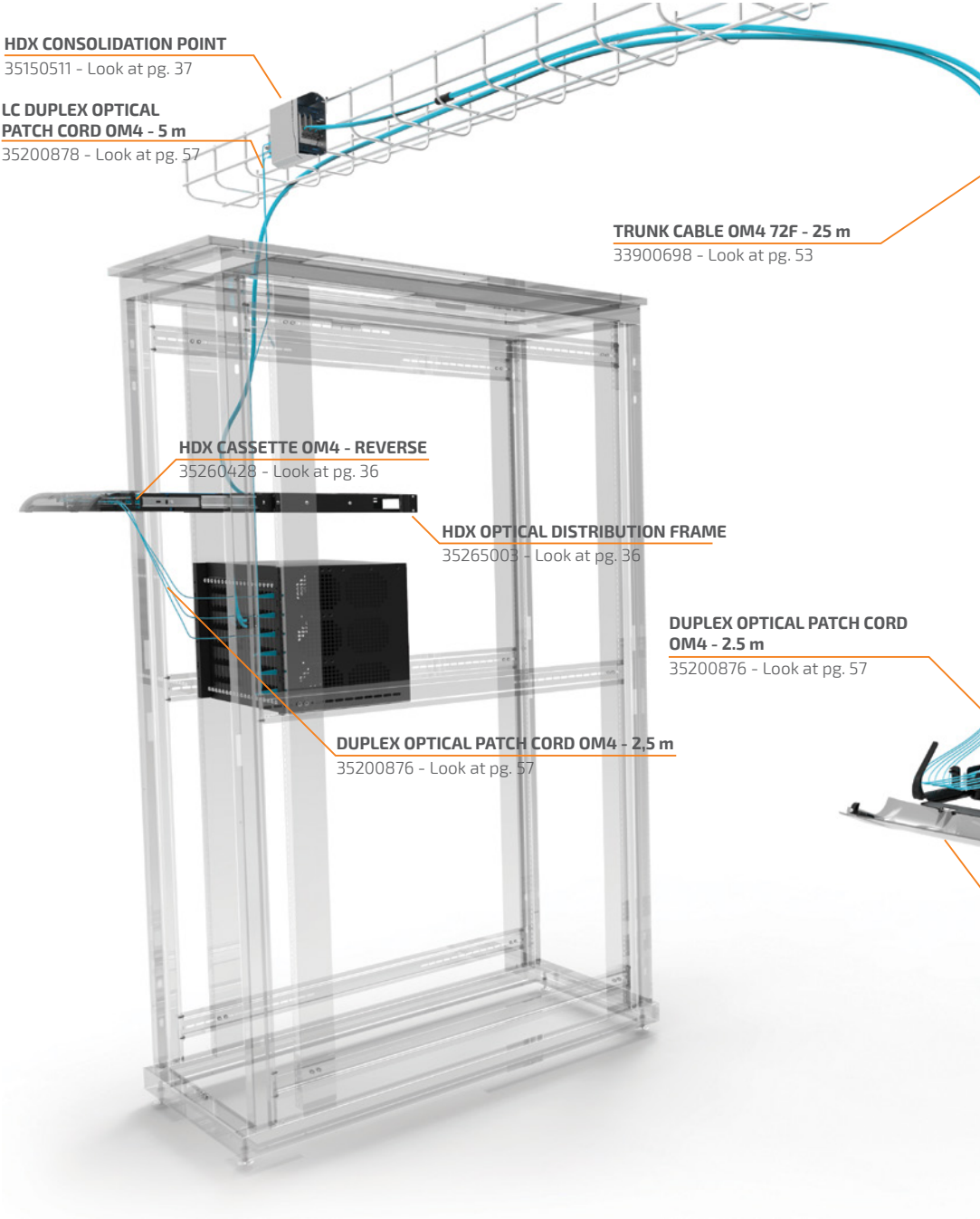


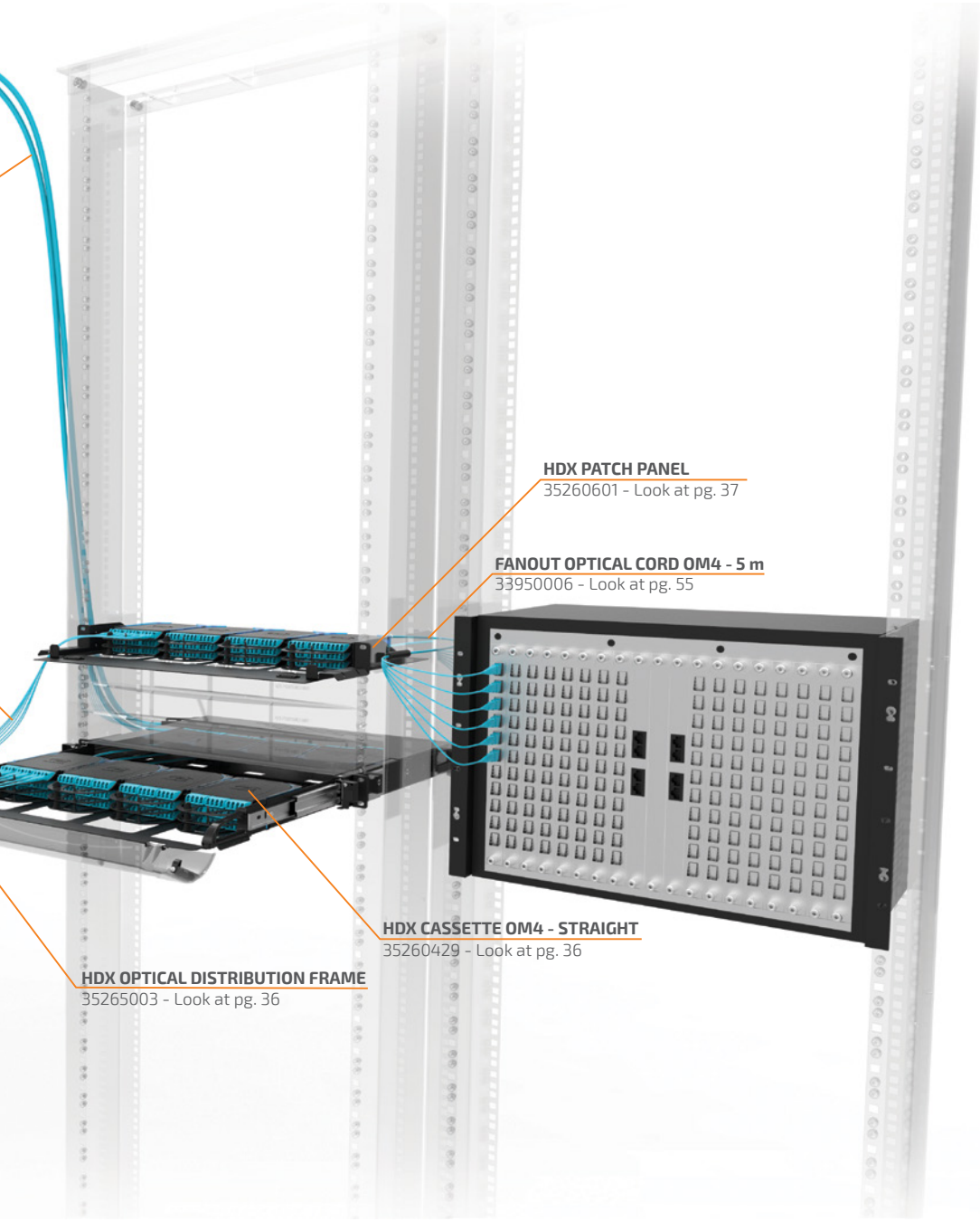
**HDX System**
**LGX System**
**Optical Distribution Frames**
**Splice Trays**
**Optical Adapters and Connectors**
**Cleaning Tools**
**Pre-terminated Optical Cables**
**Optical Cords and Pigtails**
**Equipment and PON LAN Accessories**

Pre-Terminated Splitters
Wall-mount and Floor Termination Accessories
Optical Cords and Pigtails

# TeraLan

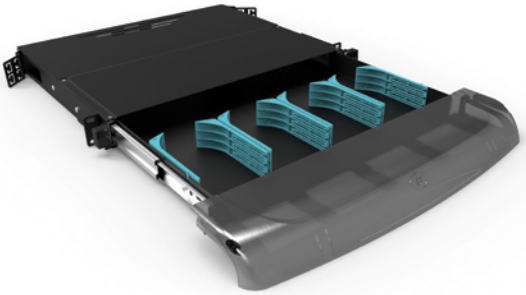
# HDX System


HDX CONSOLIDATION POINT
35150511 - Look at pg. 37
LC DUPLEX OPTICAL PATCH CORD OM4 - 5 m
35200878 - Look at pg. 57
TRUNK CABLE OM4 72F - 25 m
33900698 - Look at pg. 53
HDX CASSETTE OM4 - REVERSE
35260428 - Look at pg. 36
HDX OPTICAL DISTRIBUTION FRAME
35265003 - Look at pg. 36
DUPLEX OPTICAL PATCH CORD OM4 - 2.5 m
35200876 - Look at pg. 57
DUPLEX OPTICAL PATCH CORD OM4 - 2,5 m
35200876 - Look at pg. 57


HDX PATCH PANEL
35260601 - Look at pg. 37
FANOUT OPTICAL CORD OM4 - 5 m
33950006 - Look at pg. 55
HDX CASSETTE OM4 - STRAIGHT
35260429 - Look at pg. 36
HDX OPTICAL DISTRIBUTION FRAME
35265003 - Look at pg. 36

# HDX OPTICAL DISTRIBUTION FRAME 1U BASIC MODULE

ODF for high density systems that utilize HDX cassettes and pre-terminated systems.



## Constructive Characteristics

| | |
|---|---|
| **Width** 442 mm x **Height** 44.45 mm x **Depth** 497 mm **Color** Black | |
| **Material type** | Steel and Polycarbonate |

| Fiber count | Connector type | Cable type |
|---|---|---|
| 144 Fibers | Front side LC / Rear side MPO | Pre-terminated |
| **Size** | **Cassetes amount** | **Compatibility** |
| 1U / 19" | 12 cassettes | Cassette HDX |

## Part Number

| | |
|---|---|
| 35265003 | HDX Optical Distribution Frame 1U - Basic Module |

# HDX CASSETTE

Module with MPO 12 fibers optical adapter, female, in rear side and LC optical adapters in front side.

## Constructive Characteristics

**Width** 99 mm x **Height** 12.5 mm x **Depth** 187.3 mm **Color** Black/White

| Fiber count | Connector type | Cable type |
|---|---|---|
| 12 Fibers | Front side LC / Rear side MPO | Pre-terminated |

| Rear side connector | Fiber type | Polishing type | Model | Cassette color |
|---|---|---|---|---|
| MPO | OM4 | UPC | Straight | Black |
| | | | Reverse | White |
| | SM | APC | Straight | Black |
| | | | Reverse | White |

## Performance

| Fiber type | Typical | Maximum |
|---|---|---|
| SM | 0.40 dB | 0.80 dB |
| OM4 | 0.35 dB | |

## Part Number

| | | |
|---|---|---|
| 35260428 | ODF HDX Cassette 12F OM4 LC-UPC/MPO-UPC(F) - Type B - Reverse | OM4 |
| 35260429 | ODF HDX Cassette 12F OM4 LC-UPC/MPO-UPC(F) - Type B - Straight | |
| 35260430 | ODF HDX Cassette 12F SM LC-UPC/MPO-APC(F) - Type B - Reverse | SM |
| 35260431 | ODF HDX Cassette 12F SM LC-UPC/MPO-APC(F) - Type B - Straight | |

## HDX MODULAR PATCH PANEL

Patch Panel for high density systems that utilizes HDX cassettes and pre-terminated systems.

### Constructive Characteristics

**Width** 442 mm x **Height** 44.45 mm x **Depth** 344.5 mm **Color** Black

| **Material type** | Steel |
|---|---|

| **Fiber count** | **Connector type** | **Cable type** |
|---|---|---|
| 144 Fibers | Front side LC / Rear side MPO | Pre-terminated |

| **Size** | **Compatibility** | **Amount** |
|---|---|---|
| 1U / 19” | Cassette HDX | 12 Cassettes |

### Part Number

| 35260601 | HDX Modular Patch Panel |
|---|---|

## HDX CONSOLIDATION POINT

Indicated for high density systems that utilizes HDX cassettes and pre-terminated systems.

### Constructive Characteristics

**Width** 131 mm x **Height** 54 mm x **Depth** 174 mm **Color** Silver

| **Material type** | Stainless steel |
|---|---|

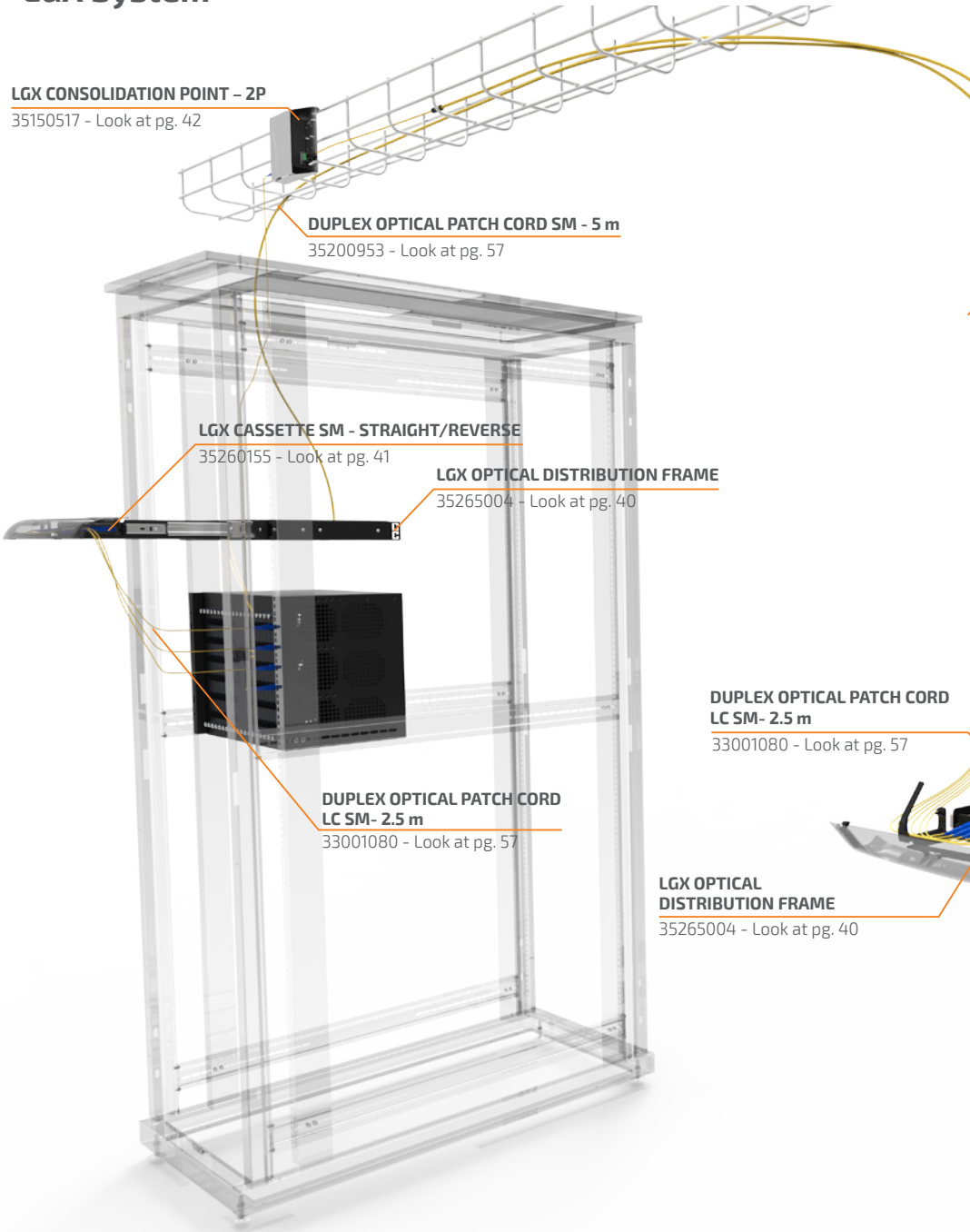
| **Fiber count** | **Connector type** | **Cable type** |
|---|---|---|
| 36 Fibers | Front side LC / Rear side MPO | Pre-terminated |

| **Size** | **Compatibility** | **Amount** |
|---|---|---|
| - | Cassettes HDX | 3 Cassettes |

### Part Number

| 35150511 | HDX Consolidation Point |
|---|---|

# LGX System



**LGX CONSOLIDATION POINT – 2P**
35150517 - Look at pg. 42

**DUPLEX OPTICAL PATCH CORD SM - 5 m**
35200953 - Look at pg. 57

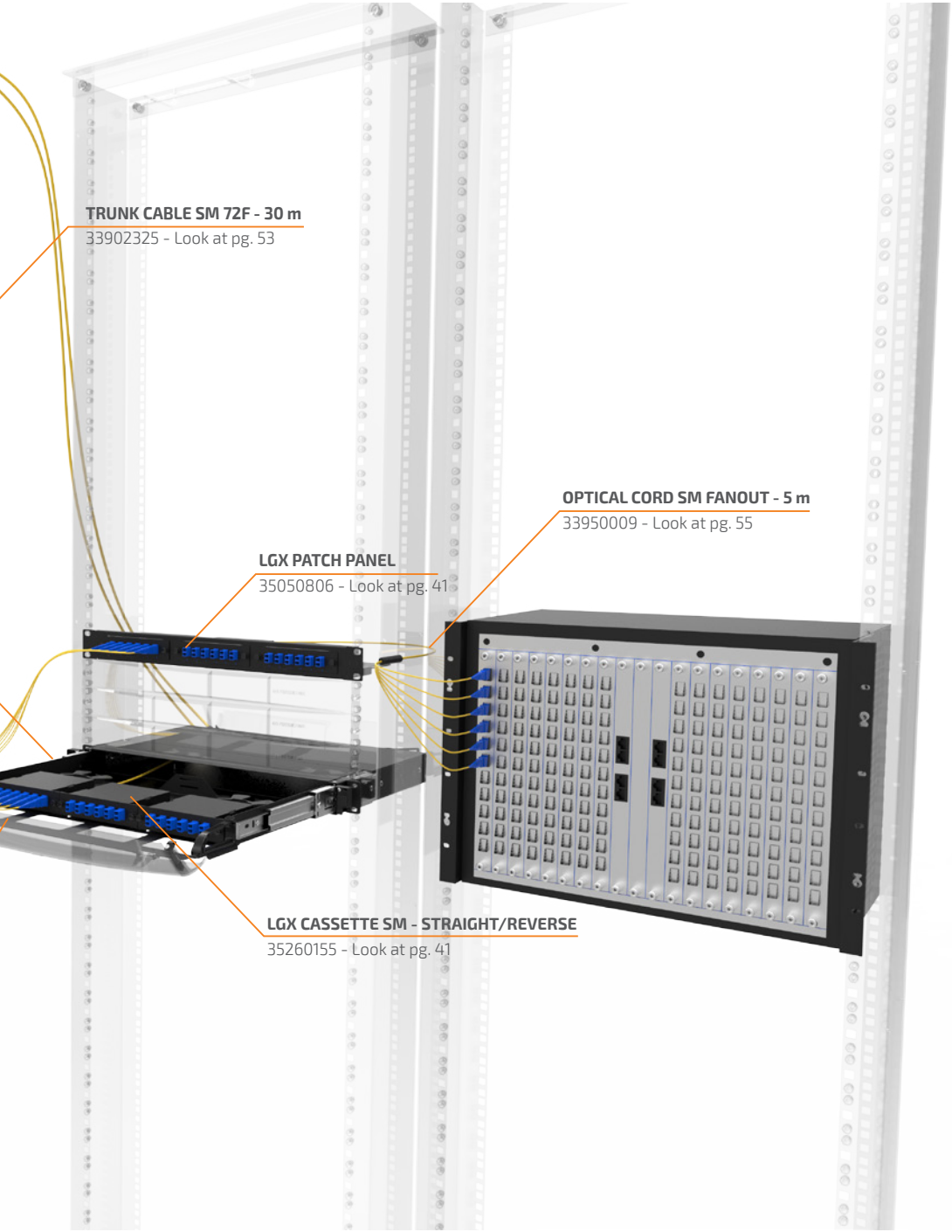
**LGX CASSETTE SM - STRAIGHT/REVERSE**
35260155 - Look at pg. 41

**LGX OPTICAL DISTRIBUTION FRAME**
35265004 - Look at pg. 40

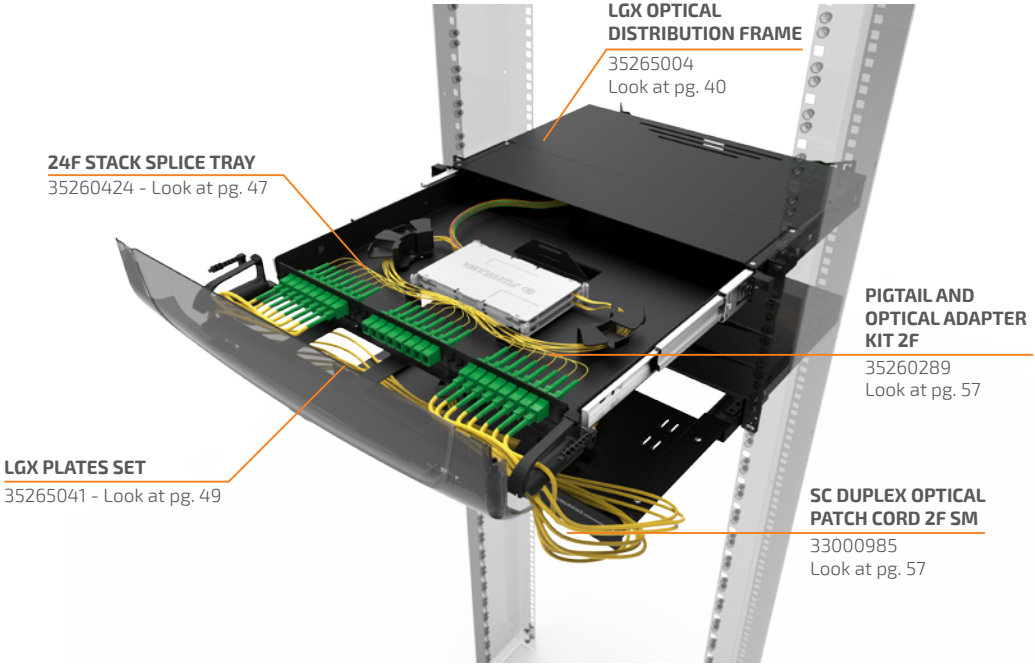
**DUPLEX OPTICAL PATCH CORD LC SM- 2.5 m**
33001080 - Look at pg. 57

**DUPLEX OPTICAL PATCH CORD LC SM- 2.5 m**
33001080 - Look at pg. 57

**LGX OPTICAL DISTRIBUTION FRAME**
35265004 - Look at pg. 40


TRUNK CABLE SM 72F - 30 m
33902325 - Look at pg. 53
OPTICAL CORD SM FANOUT - 5 m
33950009 - Look at pg. 55
LGX PATCH PANEL
35050806 - Look at pg. 41
LGX CASSETTE SM - STRAIGHT/REVERSE
35260155 - Look at pg. 41

## LGX Optical Distribution Frame Configuration




## LGX OPTICAL DISTRIBUTION FRAME 1U BASIC MODULE

ODF suitable for utilization with splice trays or pre-terminated system with LGX panels or cassettes.

### Constructive Characteristics

| | |
|---|---|
| **Width** 387 mm x **Height** 44.45 mm x **Depth** 465 mm | **Color** Black |
| **Material type** | Steel and polycarbonate |

| Fiber count | Connector type | Cable type |
|---|---|---|
| 72 Fibers | Front side LC / Rear side MPO | Pre-terminated |
| 48 Fibers | LC-Duplex | Pre-terminated / Optical splice |
| 36 Fibers | SC | |
| 24 Fibers | ST, FC, E2000 | |

| Size | Modules amount | Compatibility |
|---|---|---|
| 1U / 19" | 3 | LGX Cassettes or LGX Optical Adapter Panel |

### Part Number

| | |
|---|---|
| 35265004 | LGX Optical Distribution Frame 1U – Basic Module |

# LGX MODULAR PATCH PANEL

Modular Patch Panel for pre-terminated systems that utilize LGX cassettes.

## Constructive Characteristics

| | |
|---|---|
| **Width** 442 mm x **Height** 44.45 mm x **Depth** 169 mm | **Color** Black |
| **Material type** | Steel SAE1020 |

| Fiber count | Connector type | Cable type |
|---|---|---|
| 72 Fibers | Front side LC / Rear side MPO | Pre-terminated |
| 48 Fibers | LC-Duplex | |
| 36 Fibers | SC | |
| 24 Fibers | ST, FC | |
| 18 Positions | RJ-45 | - |

| Size | Modules amount | Compatibility |
|---|---|---|
| 1U / 19" | 3 | LGX Cassettes or LGX Optical Adapter Panel |

## Part Number

| | |
|---|---|
| 35050806 | LGX Modular Patch Panel |

# LGX CASSETTE

Pre-terminated modules, compatible with LGX standard.

## Constructive Characteristics

| | |
|---|---|
| **Width** 129.6 mm x **Height** 29.2 mm x **Depth** 101.5 mm | **Color** Black |
| **Material type** | Steel SAE1020 |

| Fiber type | Connector type | Cable type |
|---|---|---|
| 12/24 Fibers | Front side LC / Rear side MPO | Pre-terminated |

| Connector | Fiber type | Polishing |
|---|---|---|
| LC | OM/OM4 | UPC |
| | SM | |
| MPO | OM3/OM4 | |
| | SM | APC |

## Performance

| Fiber type | Typical IL | Maximum IL |
|---|---|---|
| OM3/OM4 | 0.40 dB | 0.80 dB |
| SM G-652D | 0.35 dB | |

## Part Number

| | |
|---|---|
| 35260156 | ODF LGX Cassette 12F OM3 LC-UPC/MPO-UPC(F) - Type B - Straight/Reverse |
| 35260204 | ODF LGX Cassette 24F OM3 LC-UPC/MPO-UPC(F) - Type B - Straight/Reverse |
| 35260159 | ODF LGX Cassette 12F OM4 LC-UPC/MPO-UPC(F) - Type B - Straight/Reverse |
| 35260520 | ODF LGX Cassette 24F OM4 LC-UPC/MPO-UPC(F) - Type B - Straight/Reverse |
| 35260155 | ODF LGX Cassette 12F G.652D LC-UPC/MPO-APC(F) - Type B - Straight/Reverse |
| 35260522 | ODF LGX Cassette 24F G.652D LC-UPC/MPO-APC(F) - Type B - Straight/Reverse |

## LGX CONSOLIDATION POINT

Indicated for pre-terminated systems that utilizes LGX cassettes.

### Constructive Characteristics

| | |
|---|---|
| **Color** | Silver |
| **Material type** | Stainless Steel |

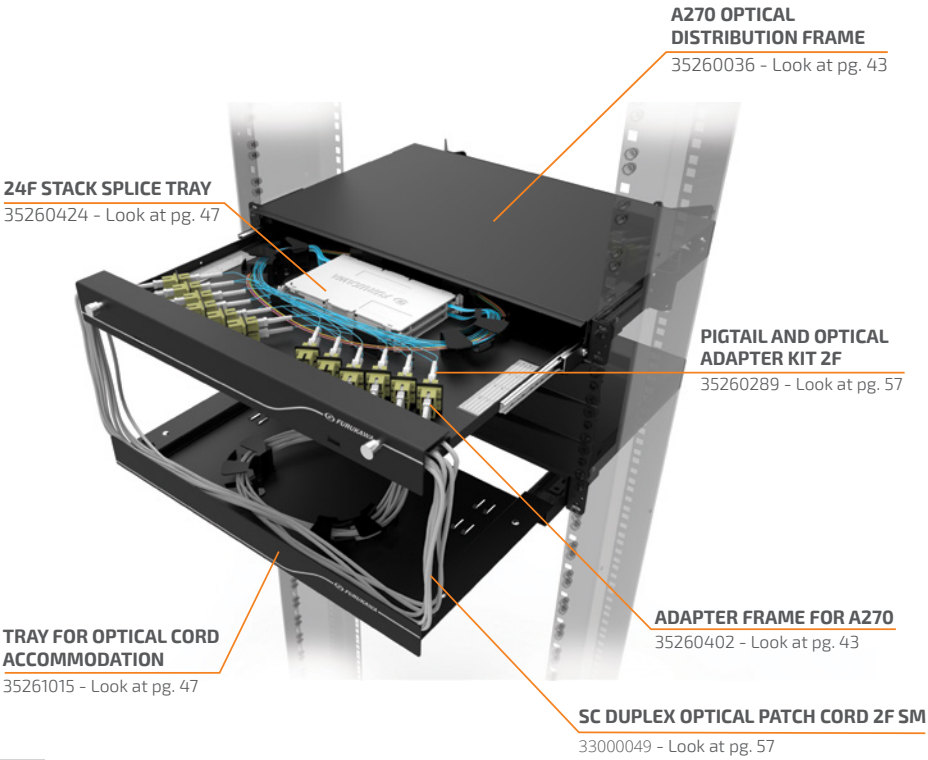
| Port Capacity | | Height | Width | Depth |
|---|---|---|---|---|
| 01 | LGX Panels or Cassettes | 35.5 mm | 132 mm | 181.7 mm |
| 02 | | 63.2 mm | | |
| 04 | | 121 mm | | |

### Part Number

| | |
|---|---|
| 35150517 | Consolidation Point 2 Positions Capacity |
| 35050801 | Consolidation Point 4 Positions Capacity |

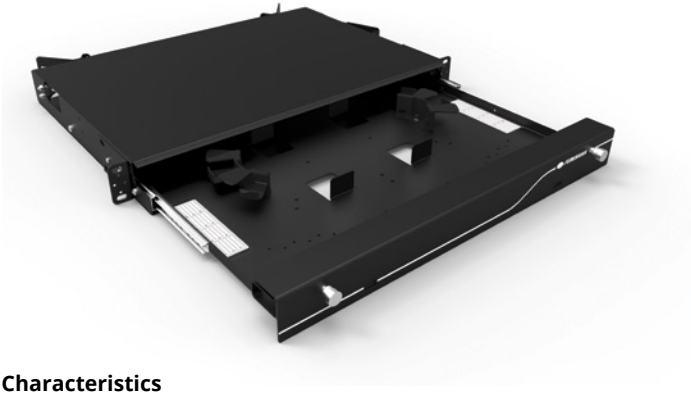
# Optical Distribution Frames

## A270 Optical Distribution Frame Configuration



# A270 OPTICAL DISTRIBUTION FRAME – BASIC MODULE

ODF for utilization in pre-terminated or splices systems. Indicated for termination of loose tube cables.



## Constructive Characteristics

| | | |
|---|---|---|
| **Width** 484 mm x **Height** 44.45 mm (1U) x **Depth** 338 mm **Color** Black | | |
| **Material type** | Steel | |
| **Fibers** | **Connector** | **Type** |
| Up to 48 Fibers | LC-Duplex | Optical splice |
| Up to 24 Fibers | SC, ST, FC or E2000 | Optical splice |
| **Compatibility** | Adapter Frame for A270 kit | |
| **Amount** | 4 Kits of 3 pieces | |

## Part Number

| | |
|---|---|
| 35260036 | A270 Optical Distribution Frame – Basic Module |

# ADAPTER FRAME FOR A270 ODF KIT

Frame for supporting optical adapters for installation in A270 ODF.

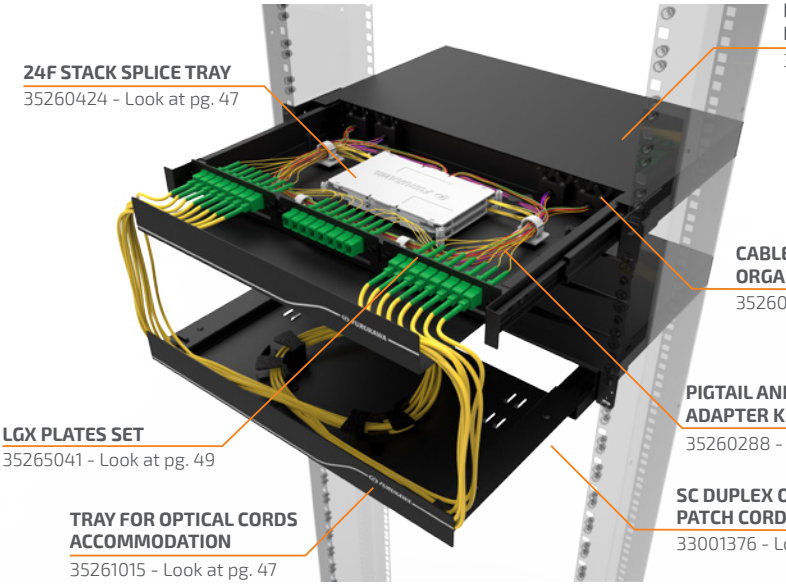
## Constructive Characteristics

| | | |
|---|---|---|
| **Width** 23 mm x **Height** 30.5 mm x **Depth** 15 mm **Color** Black | | |
| **Material type** | Steel | |
| **Painting type** | Epoxy powder coating highly resistant to scratches | |
| **Position** | **Connector** | **Type** |
| 02 ports | LC-Duplex or MT-RJ | 04 Fibers per support |
| 02 ports | SC, ST, FC or E2000 | 02 Fibers per support |

## Part Number

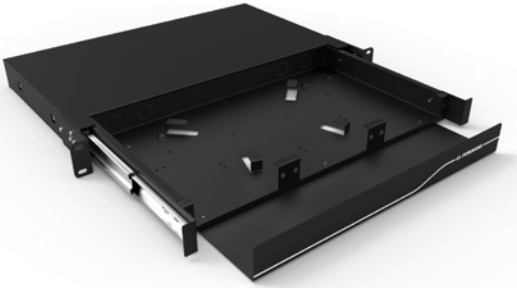
| | |
|---|---|
| 35260402 | Adapter Panel for Optical Adapters to A270 ODF LC/SC (Kit 3 pieces) |
| 35260403 | Adapter Panel for Optical Adapters to A270 ODF ST (Kit 3 pieces) |

# B 48 Optical Distribution Frame Configuration




# B 48 OPTICAL DISTRIBUTION FRAME 1U - BASIC MODULE

ODF for utilization in pre-terminated or splicing system. Indicated for termination of tight buffer cables.



## Constructive Characteristics

| | | |
|---|---|---|
| **Width** 484 mm x **Height** 44.45 mm (1U) x **Depth** 338 mm **Color** Black | | |
| **Material type** | Steel | |
| **Fibers** | **Connector** | **Type** |
| Up to 72 Fibers | LC-Duplex | Pre-terminated |
| Up to 48 Fibers | LC-Duplex | Pre-terminated / Optical splice |
| Up to 36 Fibers | SC | |
| Up to 24 Fibers | FC and ST | |

| **Compatibility** | **Amount** |
|---|---|
| LGX Optical Adapter Panel | 3 Panels |
| LGX Cassette | 3 Cassettes |

## Part Number

| | |
|---|---|
| 35260163 | B 48 Optical Distribution Frame 1U - Basic Module |

## CABLE CLAMP AND ORGANIZATION KIT FOR B 48 ODF

Accessories kit for cables organization and anchoring for B 48 ODF.

### Constructive Characteristics

| | |
|---|---|
| **Splice, field termination or pre-terminated** | Anchor support with wingnut |
| | PG 13.5 Cable Clamp |
| | Support for anchoring tension element |
| | Self-adhesive plastic clips |

### Part Number

| | |
|---|---|
| 35260064 | Cable Clamp and Organization Kit for Fiber Optic Rack Mount B 48 ODF |

## ODF BX24

ODF BX24 is an optical distributor for rack, with capacity of up to 24 splices in 1U. Its function is to store and manage cables, including pre-connectorized as well as optical cords. It has removable relays for easier instalation and maintenace.

### Constructive Characteristics

| | |
|---|---|
| **Width** 484 mm x **Height** 1U x **Depth** 280 mm **Color** Black | |
| **Number of positions** | Up to 24 fibers |
| **Product body material** | ABS+PC |
| **Connector type** | SC |
| **Polishing Type** | APC or UPC (under consult) |
| **Cable Type** | Loose Type or Tight |

### Part Number

| | |
|---|---|
| 35260707 | ODF BX 24 24F SM SC-APC - TELCORDIA |
| 35260710 | ODF BX 24 12F SM LC-UPC - TELCORDIA |
| 35260711 | ODF BX 24 24F SM LC-UPC - TELCORDIA |
| 35260727 | ODF BX 24 12F SM SC-APC - TELCORDIA |

## B 144 OPTICAL DISTRIBUTION FRAME – BASIC MODULE

ODF for high amount of fibers for splicing or pre-terminated systems.

### Constructive Characteristics

**Width** 496 mm x **Height** 177.8 mm (4U) x **Depth** 465 mm **Color** Black

| **Material type** | Steel | |
|---|---|---|
| **Fibers** | **Connector** | **Type** |
| Up to 144 fibers (36F per U) | LC-Duplex or SC | Pre-terminated or Optical splice |

### Part Number

| | |
|---|---|
| 35265051 | B 144 - Optical Distribution Frame for Rack - Basic Module (Drawer) |

## OPTICAL DISTRIBUTION FRAME FOR DIN RAIL

ODF for DIN rail, for splicing type termination.

### Constructive Characteristics

| | | |
|---|---|---|
| **Width** 41 mm x **Height** 90 mm x **Depth** 116.4 mm **Color** White | | |
| **Material type** | Plastic | |
| **Fibers** | **Connector** | **Type** |
| Up to 6 Fibers | LC-Duplex, SC, FC, ST or E2000 | Optical splice |

### Part Number

| | |
|---|---|
| 35050381 | ODF for DIN Rail 6P - White |
| 35150250 | Base for DIN Rail - ODF (5 pieces) |

## SLIMBOX 12 ODF - BASIC MODULE

ODF for utilization in splicing or pre-terminated system. Installation in flat surfaces or DIN rail.

### Constructive Characteristics

| | | |
|---|---|---|
| **Width** 130 mm x **Height** 155 mm x **Depth** 53 mm **Color** Light Gray | | |
| **Material type** | High resistance plastic | |
| **Position** | **Connector** | **Type** |
| Up to 24 Fibers | LC-Duplex | Pre-terminated |
| Up to 12 Fibers | LC-Duplex, SC, FC or ST | Pre-terminated and Optical splice |

### Part Number

| | |
|---|---|
| 35260276 | Slimbox 12-Fiber External Adapter Module (BW 12 - Basic Module) |
| 35150250 | Base for DIN Rail - ODF (5 Pieces) |

## A146 OPTICAL DISTRIBUTION FRAME – BASIC MODULE

Optical Distribution Module for splicing or pre-terminated systems. Installation in flat surfaces or DIN rail.


### Constructive Characteristics

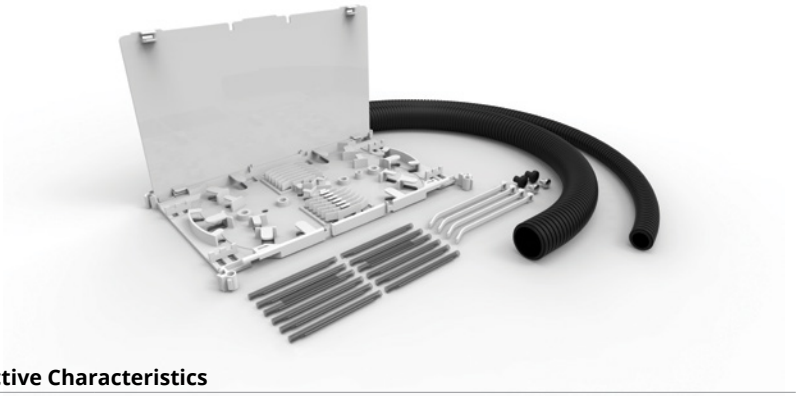
| | | |
|---|---|---|
| **Width** 224 mm x **Height** 135 mm x **Depth** 35 mm **Color** Black | | |
| **Material type** | Steel | |
| **Fibers** | **Connector** | **Type** |
| Up to 6 Fibers | LC-Duplex, SC, FC or ST | Pre-terminated and Optical Splice |
| Up to 12 Fibers | LC-Duplex | Pre-terminated |

### Part Number

| | |
|---|---|
| 35250138 | A146 ST/FC - Optical Distribution Frame for Wall - Basic Module (Wall Mount) |
| 35250151 | A146 LC/SC - Optical Distribution Frame for Wall - Basic Module (Wall Mount) |

## STACK SPLICE TRAY KIT

Accessories kit for splicing systems composed by cassettes and sleeves. Compatibility with TeraLan ODFs.



### Constructive Characteristics

| | |
|---|---|
| **Width** 155 mm x **Height** 9.2 mm x **Depth** 93 mm **Color** White | |
| **Material type** | ABS/PC (UL 94 V-0) |
| **Capacity** | 12 sleeves 40 mm per tray |
| | Available in kits for 12, 24, 36 and 48 splices |

### Part Number

| | |
|---|---|
| 35260412 | Stack Splice Tray Kit 12F for Fiber Optic Rack Mount |
| 35260424 | Stack Splice Tray Kit 24F for Fiber Optic Rack Mount |
| 35265050 | Stack Splice Tray Kit 36F for Fiber Optic Rack Mount |
| 35260218 | Stack Splice Tray Kit 48F for Fiber Optic Rack Mount |

## TRAY FOR OPTICAL CORDS ACCOMMODATION

Tray for administration and organization of excess optical cords.

### Constructive Characteristics

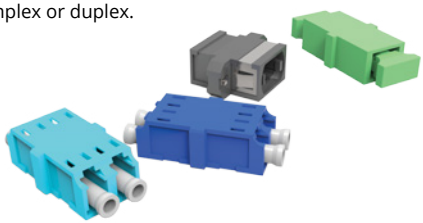
| | |
|---|---|
| **Width** 484 mm x **Height** 44.45 mm (1U) x **Depth** 320 mm **Color** Black | |
| **Painting type** | Epoxy powder coating highly resistant to scratches |
| **Capacity** | 30 m of 2 mm duplex optical cord |

### Part Number

| | |
|---|---|
| 35261015 | Tray for Optical Cords Accommodation 1U Short |

## OPTICAL ADAPTER KIT

Optical adapter kit simplex or duplex.



### Constructive Characteristics

| | |
|---|---|
| **Fiber count** | 02 fibers (1 piece for duplex adapters or 2 for simplex adapters) |
| | 06 fibers (3 pieces for duplex adapters or 6 for simplex adapters) |
| | 12 fibers (1 piece, only for MPO adapters) |
| | 72 fibers (6 pieces, only for MPO adapters) |

| Adapter | Fiber type | Polishing type | Color |
|---|---|---|---|
| SC | SM | PC | Blue |
| | | APC | Green |
| | MM | PC | Beige |
| LC-Duplex | SM | PC | Blue |
| | | APC | Green |
| | MM | PC | Beige |
| ST | SM / MM | PC | Metallic |
| FC | SM | PC and APC | Metallic |
| | MM | PC | |
| MT-RJ | SM / MM | PC | Black |
| E2000 | SM | APC | Green |
| MPO | SM / MM | PC e APC | Black (type A) |
| | | | Gray (type B) |

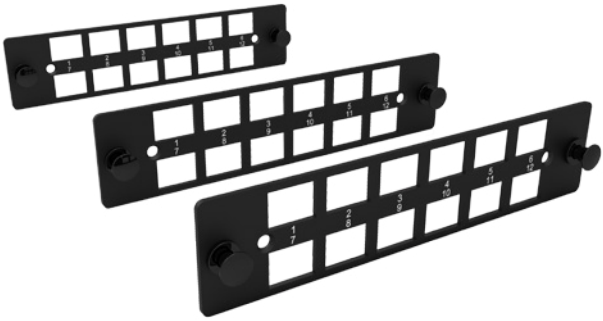
### Part Number

| | | | SC | LC-Duplex | ST | FC | MT-RJ |
|---|---|---|---|---|---|---|---|
| PC | 02F | Multimode (MM) | 35260344 | 35260342 | 35260345 | 35260341 | 35260343 |
| | | Single-Mode (SM) | 35260339 | 35260322 | 35260307 | 35260321 | 35260338 |
| | 06F | Multimode (MM) | 35260092 | 35260091 | 35260093 | - | - |
| | | Single-Mode (SM) | 35260097 | 35260095 | 35260098 | 35260094 | - |
| APC | 02F | Single-Mode (SM) | 35260323 | 35260337 | - | - | - |
| | 06F | | 35260096 | - | - | - | - |
| | 08F | | 35260476 (side shutter) | - | - | - | - |
| | | | 35260479 (front shutter) | - | - | - | - |

| MPO | | |
|---|---|---|
| Type A | Multimode (MM) | 35260169 |
| Type B | Single-Mode (SM) | 35260217 |

# LGX PLATES SET

Kit with 3 LGX panels, suitable for utilization with SC or LC, FC or ST and MPO connectors or closing panel.



## Constructive Characteristics

| | | |
|---|---|---|
| **Width** 129.6 mm x **Height** 29.2 mm | **Color** Black | |
| **Material type** | Steel or plastic | |
| **Painting type** | Plate on steel | Epoxy powder coating highly resistant to scratches |

| **Connector** | **MPO** | **LC or SC** | **FC or ST** |
|---|---|---|---|
| **Number of ports** | 06 | 06, 08 or 12 | 08 |

## Part Number

| | | | |
|---|---|---|---|
| 35260604 | 06 ports | MPO | Metallic |
| 35265040 | | LC/SC | Plastic |
| 35265043 | | MPO | |
| 35265041 | 08 ports | LC/SC | |
| 35260602 | | | Metallic |
| 35260603 | | ST/FC | |
| 35260606 | | Angular LC/SC | |
| 35260074 | 12 ports | LC/SC | |
| 35265042 | | | Plastic |
| 35265025 | LGX Blank Panel Kit (3 pieces) | | Plastic |

# OPTICAL ADAPTER SET

Kit with optical coupler encapsulated with RJ-45 housing.

## Constructive Characteristics

| | | |
|---|---|---|
| **Positions amount** | LC-Duplex | 02 ports |
| | SC | 01 port |
| | ST | |
| **Polishing type** | UPC | |

| Adapter | Fiber type | Color of RJ-45 housing | Color of optical adapter |
|---|---|---|---|
| LC-Duplex | SM | White | Blue |
| | MM | | Beige |
| SC | SM | Beige, white, gray and black | Blue |
| | MM | | Beige |
| ST | SM / MM | Beige and gray | Metallic |

## Part Number

| | | | |
|---|---|---|---|
| 35050278 | LC-PC | MM | White |
| 35050279 | LC-PC | SM | |
| 35050368 | SC-SPC | | Beige |
| 35050367 | | | White |
| 35050366 | | | Gray |
| 35050341 | ST-SPC | SM and MM | Beige |

# INDUSTRIAL OPTICAL ADAPTER IP67 LC - DUPLEX

Industrial optical adapter suitable for harsh environment.

## Constructive Characteristics

| | |
|---|---|
| **Fiber count** | 02 Fibers |
| **Fiber type** | Multimode and Single-Mode |
| **Color** | Black |
| **Adapter type** | LC Duplex |

## Part Number

| | | |
|---|---|---|
| 35260515 | 02 Fibers | SM |
| 35260516 | 02 Fibers | MM |

## CLEANING TOOL - MPO

Enhance optical connections through cleaning of impurities placed on connectors and adapters.

### Constructive Characteristics

| | |
|---|---|
| **Cleaning tool compatible with male and female MPO connectors and adapters** | Ergonomic shape |
| | Allow more than 600 times |
| | Compatible with UPC and APC connectors |
| | Designed for cleaning MPO/MTP connectors |

### Part Number

| | |
|---|---|
| 35300011 | MPO Cleaning Tool |

## LC CLEANING TOOL

Enhance optical connections through cleaning of impurities placed on connectors and adapters.

### Constructive Characteristics

| | |
|---|---|
| **Cleaning tool for 1.25 mm connectors and LC, SFP or GBIC adapters** | Ergonomic shape |
| | Allow more than 500 times |
| | Compatible with PC and APC connectors |
| | Designed for cleaning 1.25 mm connectors |

### Part Number

| | |
|---|---|
| 35300010 | LC Cleaning Tool |

## SC/ST/FC/E2000 CLEANING TOOL

Enhance optical connections through cleaning of impurities placed on connectors and adapters.

### Constructive Characteristics

| | |
|---|---|
| **Cleaning tool for 2.5 mm connectors and SC, ST, FC, E2000, SFP or GBIC adapters** | Ergonomic shape |
| | Allow more than 500 times |
| | Compatible with PC and APC connectors |
| | Designed for cleaning 2.5 mm connectors |

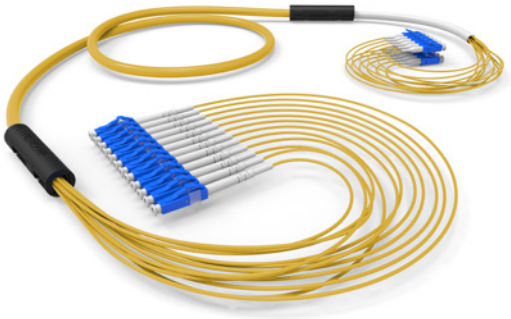
### Part Number

| | |
|---|---|
| 35300009 | SC/ST/FC/E2000 Cleaning Tool |

# Pre-Terminated Optical Cords and Cables

## SINGLE FIBER TRUNK CABLE

Optical cable pre-terminated with LC or SC connectors in both ends.



### Constructive Characteristics

| Length | Cable type | Fiber count |
|---|---|---|
| From 10 up to 150 m | Unique tube | 12 Fibers |
| | Totally dry | 24, 36 or 72 Fibers |

| Connector | Fiber type | Polishing type | Cable color |
|---|---|---|---|
| LC or SC | SM | UPC | Yellow |
| | MM | | Aqua |

### Performance

| Fiber type | Insertion loss | Return loss |
|---|---|---|
| Single-Mode G.652D and G.657A (9/125 µm) | 0.15 dB (typical) | ≥ 50 dB |
| | 0.30 dB (maximum) | |
| Multimode OM3 and OM4 (50.0/125 µm) | 0.15 dB (typical) | ≥ 30 dB |
| | 0.30 dB (maximum) | |

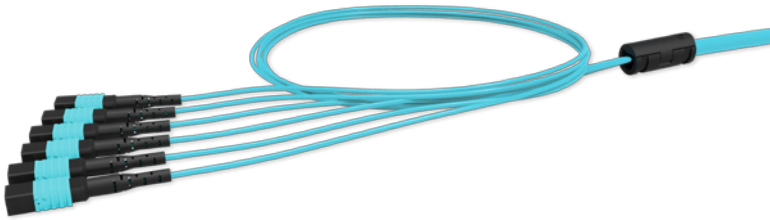
### Part Number

| | |
|---|---|
| 33902512 | Trunk Cable Pre-Terminated 12F BLI-A/B G.657A LC-UPC/LC-UPC 1.0D2/1.0D2 15.0 m - UT - LSZH - Yellow (A - B) |
| 33900725 | Trunk Cable Pre-Terminated 72F OM4 LC-UPC/LC-UPC 1.0D2/1.0D2 20.0 m - TS - LSZH - Aqua |
| 33902681 | Trunk Cable Pre-Terminated 12F BLI A/B G-657A SC-APC/SC-APC 0.8D2/0.8D2 40.0 m - UT- LSZH - Yellow |

Additional configurations available on request.

# MPO TRUNK CABLE

Optical cable pre-terminated with MPO connectors in both ends, supplied with pulling accessory.



## Constructive Characteristics

| Length | Cable type | Fiber count | Flammability class |
|---|---|---|---|
| From 10 up to 150 m | Unique tube | 12 Fibers | LSZH |
| | Totally dry | 24, 36 or 72 Fibers | |
| **Connector** | **Fiber type** | **Polishing type** | **Cable color** |
| MPO (male or female) | SM | APC | Yellow |
| | MM | UPC | Aqua |

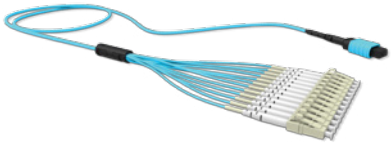
## Performance

| Fiber type | Insertion loss | Return loss |
|---|---|---|
| Single-Mode G.652D and G.657.A | 0.25 dB (typical) | ≥ 40 dB |
| | 0.50 dB (maximum) | |
| Multimode OM3 and OM4 | 0.15 dB (typical) | ≥ 20 dB |
| | 0.50 dB (maximum) | |

## Part Number

| | |
|---|---|
| 33902330 | Trunk Cable Pre-Terminated 12F OM3 MPO12-UPC(M)/MPO12-UPC(M) 0.8D3/0.8D3 30.0 m - UT - LSZH - Aqua - Type B |
| 33902497 | Trunk Cable Pre-Terminated 12F OM4 MPO12-UPC(M)/MPO12-UPC(M) 0.8D3/0.8D3 30.0 m - UT - LSZH - Aqua - Type B |
| 33902513 | Trunk Cable Pre-Terminated 12F BLI-A/B G.657.A MPO12-APC(M)/MPO12-APC(M) 0.8D3/0.8D3 50.0 m - UT - LSZH - Yellow - Type B |
| 33900670 | Trunk Cable Pre-Terminated 24F OM3 MPO12-UPC(M)/MPO12-UPC(M) 0.8D3/0.8D3 30.0 m - TS - LSZH - Aqua - Type B |
| 33900674 | Trunk Cable Pre-Terminated 24F OM4 MPO12-UPC(M)/MPO12-UPC(M) 0.8D3/0.8D3 30.0 m - TS - LSZH - Aqua - Type B |
| 33900682 | Trunk Cable Pre-Terminated 36F OM3 MPO12-UPC(M)/MPO12-UPC(M) 0.8D3/0.8D3 30.0 m - TS - LSZH - Aqua - Type B |
| 33900686 | Trunk Cable Pre-Terminated 36F OM4 MPO12-UPC(M)/MPO12-UPC(M) 0.8D3/0.8D3 30.0 m - TS - LSZH - Aqua - Type B |
| 33900694 | Trunk Cable Pre-Terminated 72F OM3 MPO12-UPC(M)/MPO12-UPC(M) 0.8D3/0.8D3 30.0 m - TS - LSZH - Aqua - Type B |
| 33900698 | Trunk Cable Pre-Terminated 72F OM4 MPO12-UPC(M)/MPO12-UPC(M) 0.8D3/0.8D3 30.0 m - TS - LSZH - Aqua - Type B |
| 33902325 | Trunk Cable Pre-Terminated 72F SM MPO12-APC(M)/MPO12-APC(M) 0.8D3/0.8D3 30.0 m - TS - LSZH - Yellow - Type B |

# FANOUT TRUNK CABLE



Optical cable pre-terminated with MPO connector in one end and with LC connectors in opposite end.

## Constructive Characteristics

| Length | Cable type | Fiber count | Flammability class |
|---|---|---|---|
| From 10 up to 100 m | Tight buffer | 12 Fibers | LSZH |
| | Totally dry | 24. 36 or 72 Fibers | |
| **Connector** | **Fiber type** | **Polishing type** | **Cable color** |
| MPO (male or female) | SM | APC | Yellow |
| | MM | UPC | Aqua |
| LC | SM | UPC | Yellow |
| | MM | | Aqua |

## Performance

| Connector | Fiber type | Insertion loss | Return loss |
|---|---|---|---|
| MPO / MTP | Single-Mode G.652D and G.657A (9/125 µm) | 0.25 dB (typical) | ≥ 40 dB |
| | | 0.50 dB (maximum) | |
| | Multimode OM3 and OM4 (50/125 µm) | 0.15 dB (typical) | ≥ 20 dB |
| | | 0.50 dB (maximum) | |
| LC | Single-Mode G.652D and G.657.A (9/125 µm) | 0.15 dB (typical) | ≥ 50 dB |
| | | 0.30 dB (maximum) | |
| | Multimode OM3 and OM4 (50/125 µm) | 0.15 dB (typical) | ≥ 30 dB |
| | | 0.30 dB (maximum) | |

## Part Number

| | |
|---|---|
| 33900809 | Trunk Cable Pre-Terminated 12F OM3 LC-UPC/MPO12-UPC(M) 0.8D2.0/1.0D3.0 15.0 m - UT - LSZH - Aqua |
| 33903055 | Trunk Cable Pre-Terminated 12F BLI-A/B G-657A LC-UPC/MPO-APC(M) 1.0D2/0.8D3 15.0 m - UT - LSZH - Yellow |
| 33900723 | Trunk Cable Pre-Terminated Fanout 72F OM4 LC-UPC/MPO12-UPC(F) 0.8D2/1.0D3 20.0 m - TS – LSZH - Aqua |

Additional configurations available on request.

# MPO OPTICAL CORD

Optical cord with MPO connectors in both ends.

## Constructive Characteristics

| | |
|---|---|
| **Length** | From 5 up to 20 m |
| **Cable type** | 3 mm Multifiber optical cord |
| **Flammability class** | LSZH |
| **Fiber count** | 12 Fibers |

| Connector | Fiber type | Polishing type | Cable color |
|---|---|---|---|
| MPO (male or female) | SM | APC | Yellow |
| | MM | UPC | Aqua |

## Performance

| Fiber type | Insertion Loss | Return Loss |
|---|---|---|
| Single-Mode G.652D (9/125 µm) | 0.25 dB (typical) | ≥ 40 dB |
| | 0.50 dB (maximum) | |
| Single-Mode OM4 (50/125 µm) | 0.15 dB (typical) | ≥ 20 dB |
| | 0.50 dB (maximum) | |

## Part Number

| | |
|---|---|
| 33950004 | Optical Patch Cord 12F SM G-652D MPO12-APC(F)/MPO12-APC(F) 10.0D3 - MTF - LSZH - Yellow - Type B |
| 33950000 | Optical Patch Cord 12F OM4 MPO12-UPC(F)/MPO12-UPC(F) 5.0D3 - MTF - LSZH - Aqua - Type B |

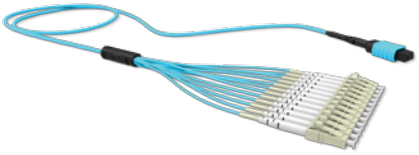
Additional configurations available on request.

# MPO FANOUT CORD

Optical cord with 12 fibers and 3 mm pre-terminated with MPO connector in one end and LC connectors in opposite end.

## Constructive Characteristics

| | |
|---|---|
| **Length** | From 5 up to 20 m |
| **Cable type** | 3mm Multifiber optical cord |
| **Flammability class** | LSZH |
| **Fiber count** | 12 Fibers |



| Connector | Fiber type | Polishing type | Color cable |
|---|---|---|---|
| MPO (male or female) | SM | APC | Yellow |
| | MM | UPC | Aqua |
| LC | SM | UPC | Yellow |
| | MM | | Aqua |

## Performance

| Connector | Fiber type | Insertion loss | Return loss |
|---|---|---|---|
| MPO / MTP | Single-Mode G.652D (9/125 µm) | 0.25 dB (typical) | ≥ 40 dB |
| | | 0.50 dB (maximum) | |
| | Multimode OM4 (50/125 µm) | 0.15 dB (typical) | ≥ 20 dB |
| | | 0.50 dB (maximum) | |
| LC | Single-Mode G.652D (9/125 µm) | 0.15 dB (typical) | ≥ 50 dB |
| | | 0.30 dB (maximum) | |
| | Multimode OM4 (50/125 µm) | 0.15 dB (typical) | ≥ 30 dB |
| | | 0.30 dB (maximum) | |
| **Number of cycles** | > 500 insertions | | |

## Part Number

| | |
|---|---|
| 33950006 | Optical Patch Cord Fanout 12F OM4 LC-UPC/MPO-UPC(M) 0.7D2/5.0D3 - MTF - LSZH - Aqua |
| 33950041 | Optical Patch Cord Fanout 12F OM4 LC-UPC/MPO-UPC(M) 0.7D2/20.0D3 - MTF - LSZH - Aqua |
| 33950009 | Optical Patch Cord Fanout 12F SM G-652D LC-UPC/MPO-APC(M) 0.7D2/5.0D3 - MTF - LSZH - Yellow |
| 33950010 | Optical Patch Cord Fanout 12F SM G-652D LC-UPC/MPO-APC(M) 0.7D2/10.0D3 - MTF - LSZH - Yellow |

# INDUSTRIAL TRUNK CABLE IP67 LC/LC

Optical cord with 2 fibers indoor/outdoor, for installation on harsh environments.

## Constructive Characteristics

| | |
|---|---|
| **Length** | From 5 up to 20 m |
| **Cable type** | Tight buffer |
| **Fiber count** | 02 Fibers |
| **Fiber type** | SM or MM (50.0) |
| **Flammability class** | LSZH |
| **Connector type** | LC duplex IP 67 |

## Part Number

| | |
|---|---|
| 33901063 | Industrial Trunk Cable Connectorized 02F SM LC-SPC(IP67)/LC-SPC(IP67) 10.0 m - Tight - LSZH - Black - Indoor/Outdoor |
| 33901064 | Industrial Trunk Cable Hybrid Connectorized 02F 50.0 LC-SPC/LC-SPC(IP67) 0.4D2/10.0 m - Tight - LSZH - Black - Indoor/Outdoor |
| 33901065 | Industrial Trunk Cable Connectorized 02F 50.0 LC-SPC(IP67)/LC-SPC(IP67) 10.0 m - Tight - LSZH - Black - Indoor/Outdoor |
| 33901066 | Industrial Trunk Cable Hybrid Connectorized 02F 50.0 LC-SPC/LC-SPC(IP67) 0.4D2/10.0 m - Tight - LSZH - Black - Indoor/Outdoor |

## OPTICAL PATCH CORDS AND PIGTAILS

### Constructive Characteristics

| | |
|---|---|
| **Length** | From 0.5 m up to 50 m |
| **Flammability class** | OFN (standard supply) and LSZH |
| | Pigtail 0.9 mm only in OFN |
| **Fiber count** | 01 or 02 Fibers |

### Configuration

| | |
|---|---|
| **Optical cord** | Simplex or Duplex optical cord with connectors in both ends. |
| **Optical pigtail** | Simplex or Duplex optical element with connector in one end. |
| **Connected optical pigtail** | Pigtail and optical adapter kit. |

| Connector | | Fiber type | Polishing type | Color |
|---|---|---|---|---|
| LC | • Type SFF “push-pull”<br>• Plastic body<br>• Ceramic ferrule (zirconia) | SM | APC | Green |
| | | | PC, SPC and UPC | Blue |
| | | MM | PC, SPC and UPC | Beige |
| SC | • Type “push-pull”<br>• Plastic body<br>• Ceramic ferrule (zirconia) | SM | APC | Green |
| | | | PC, SPC and UPC | Blue |
| | | MM | PC, SPC and UPC | Beige |
| MT-RJ | • Type “push-pull”<br>• Plastic body and ferrule<br>• With or without guide pin (male or female)<br>• Duplex with reduced dimensions<br>• Available in Parallel or Cross models | SM | PC | Black |
| | | MM | | |
| ST | • Guide pin type (BNC)<br>• Metallic body<br>• Ceramic ferrule (zirconia) | SM / MM | PC, SPC and UPC | Metallic |
| FC | • Screw type<br>• Metallic body<br>• Ceramic ferrule (zirconia) | SM | APC | |
| | | | PC, SPC and UPC | |
| | | MM | PC, SPC and UPC | |
| E2000 | • Type “push-pull”<br>• Plastic body<br>• Ceramic ferrule (zirconia) | SM | APC | Green |

### Performance

| | |
|---|---|
| **Insertion loss and return loss** | Performance parameters are in conformance with IEC 61754 standard. All losses can be optimized according to connector and polishing type on request. |
| **Number of cycles** | > 500 insertions (per connector) |

| Cable type | Fiber type | Color |
|---|---|---|
| COA-DP ou COA-MF / optical element | Single-Mode, G.652D, G.657A and G.657B | Yellow |
| | Multimode OM1 and OM2 | Orange |
| | Multimode OM3 and OM4 | Aqua |

# OPTICAL PATCH CORD

## Constructive Characteristics

| | | |
|---|---|---|
| **Nominal diameter** | Simplex | 2 and 3 mm |
| | Duplex | 4.5 mm and 5.9 mm |
| **Length** | From 1.5 up to 20 m | |

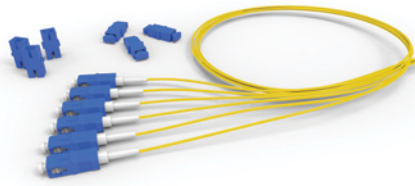
## Part Number

| | |
|---|---|
| 35200625 | Duplex Optical Patch Cord 62.5 LC-SPC/LC-SPC 2.5 m - OFN - Orange (A – B) |
| 35200015 | Duplex Optical Patch Cord 62.5 ST-SPC/ST-SPC 2.5 m - OFN - Orange |
| 33001292 | Duplex Optical Patch Cord 50.0 SC-SPC/ST-SPC 3.0 m - OFN - Orange |
| 35200912 | Duplex Optical Patch Cord 50.0 LC-SPC/LC-SPC 2.5 m - OFN - Orange (A – B) |
| 35200171 | Duplex Optical Patch Cord 50.0 SC-SPC/ST-SPC 2.5 m - OFN - Orange |
| 33000468 | Duplex Optical Patch Cord 50.0 ST-SPC/ST-SPC 3.0 m - OFN - Orange |
| 35200170 | Duplex Optical Patch Cord 50.0 SC-SPC/SC-SPC 1.5 m - OFN - Orange |
| 35200926 | Duplex Optical Patch Cord 50.0 LC-SPC/LC-SPC 1.5 m - OFN - Orange (A – B) |
| 35200249 | Duplex Optical Patch Cord 50.0 LC-SPC/SC-SPC 3.0 m - OFN - Orange |
| 35200861 | Duplex Optical Patch Cord OM3 LC-UPC/LC-UPC 1.5 m - OFN - Aqua (A – B) |
| 35200839 | Duplex Optical Patch Cord OM3 LC-UPC/LC-UPC 1.5 m - OFN - Aqua |
| 35200878 | Duplex Optical Patch Cord OM4 LC-UPC/LC-UPC 5.0 m - OFN - Aqua (A – B) |
| 35200876 | Duplex Optical Patch Cord OM4 LC-UPC/LC-UPC 2.5 m - OFN - Aqua (A – B) |
| 35200953 | Duplex Optical Patch Cord SM G-652D LC-UPC/LC-UPC 5.0 m - OFN - Yellow (A – B) |
| 33001080 | Duplex Optical Patch Cord SM G-652D LC-UPC/LC-UPC 2.5 m - OFN - Yellow (A – B) |
| 33000985 | Duplex Optical Patch Cord SM G-652D SC-APC/SC-APC 1.5 m - Yellow |
| 33001375 | Duplex Optical Patch Cord SM G-652D SC-UPC/SC-UPC 1.5 m - OFN - Yellow |
| 33001376 | Duplex Optical Patch Cord SM G-652D SC-UPC/SC-UPC 2.5 m - OFN - Yellow |

Additional configurations available on request.

# PIGTAIL AND OPTICAL ADAPTER KIT

Pigtail and Optical Adapter supplied in kit.



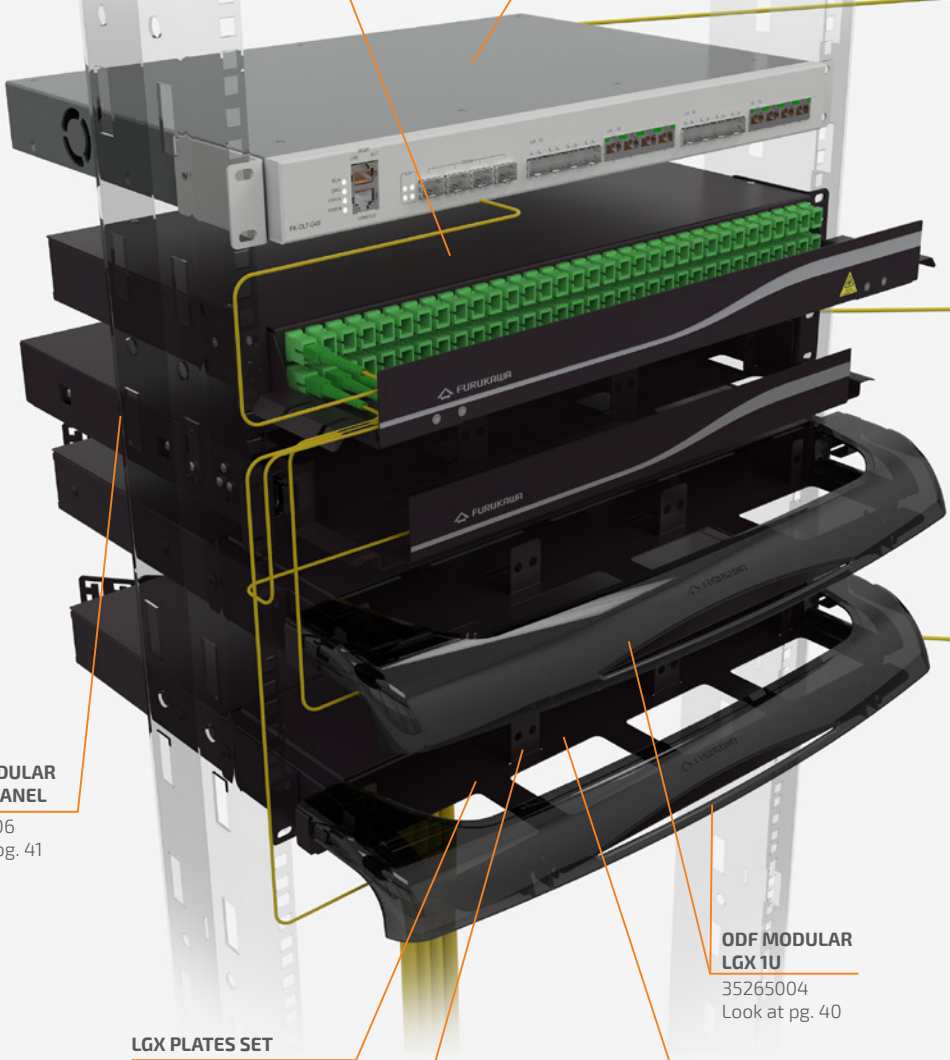
## Constructive Characteristics

| | |
|---|---|
| **Nominal diameter** | 0.9 and 2 mm |
| **Length** | 1.5 m |
| **Amount of simplex pigtails** | 02 or 06 Fibers |

## Part Number

| | | | SC | LC | ST | FC |
|---|---|---|---|---|---|---|
| SPC | 06 Fibers | OM1 | 35260136 | 35260081 | 35260082 | - |
| | | OM2 | 35260134 | 35260129 | - | - |
| UPC | | OM3 | 35260468 | 35260469 | - | - |
| | | OM4 | - | 35260387 | - | - |
| | | SM | 35260357 | 35260355 | 35260350 | 35260334 |
| SPC | 02 Fibers | OM1 | 35260314 | 35260309 | - | - |
| | | OM2 | 35260137 | 35260138 | - | - |
| UPC | | OM3 | 35260400 | 35260467 | 35260252 | - |
| | | OM4 | 35260401 | 35260388 | - | - |
| | | SM | 35260289 | 35260287 | 35260333 | 35260303 |
| APC | 06 Fibers | | 35260346 | 35260335 | - | - |
| | 02 Fibers | | 35260288 | 35260305 | - | 35260302 |

Additional configurations available on request.




**MODULAR OPTICAL SPLITTER 19"**
35500035 - Look at pg. 65

**OPTICAL CONCENTRATOR GPON FK-OLT-G4S**
35510190 - Look at pg. 62

**LGX MODULAR PATCH PANEL**
35050806
Look at pg. 41

**ODF MODULAR LGX 1U**
35265004
Look at pg. 40

**LGX PLATES SET**
35265042 - Look at pg. 49

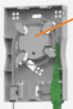
**OPTICAL ADAPTER KIT 06F SM SC-APC**
35260096 - Look at pg. 48

**STACK SPLICE TRAY KIT 36F**
35265050
Look at pg. 47

**OPTICAL CABLE FIBER-LAN INDOOR**
35261167
Look at pg. 167

**SLIMBOX 12 ODF**
35260276
Look at pg. 46

**OPTICAL ROSETTE 2P 4X2**
35250168 - Look at pg. 67



**U/UTP CAT.6 PATCH CORD GIGALAN 2.5 m**
35123304
Look at pg. 97

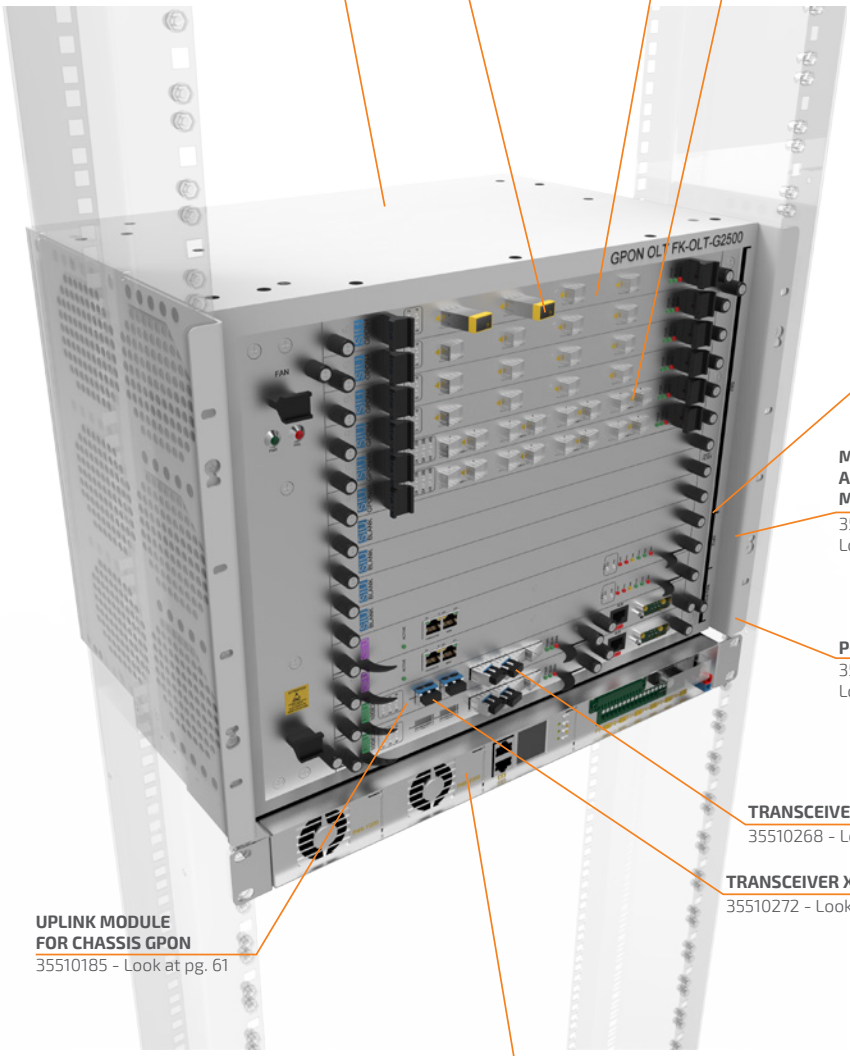
**ODF BW12**
35260276
Look at pg. 46

**SIMPLEX OPTICAL PATCH CORD SM SC-APC/SC-APC 2.5 m**
33006401 - Look at pg. 71

**LGX CONSOLIDATON POINT**
35150517
Look at pg. 48

**OPTICAL MODEM GPON FK-ONT-G400B/PoE S2**
35510259 - Look at pg. 65

# PON LAN Equipment and Accessories




**TRANSCEIVER SFP GPON OLT CLASS B+**
35510197 - Look at pg. 61

**CHASSIS OLT GPON FK-OLT-G2500**
35510205 - Look at pg. 61

**SERVICE MODULE WITH 4 SFP**
35510187 - Look at pg. 61

**SERVICE MODULE WITH 4 REDUNDANT SFP**
35510188 - Look at pg. 61

**BLANK PANEL - SERVICE MODULE**
35510189
Look at pg. 61

**MANAGEMENT AND SWITCH MODULE**
35510207
Look at pg. 61

**POWER SUPPLY DC**
35510181
Look at pg. 61

**TRANSCEIVER SFP GE**
35510268 - Look at pg. 61

**TRANSCEIVER XFP 10 GE**
35510272 - Look at pg. 61

**UPLINK MODULE FOR CHASSIS GPON**
35510185 - Look at pg. 61

**POWER SUPPLY EQUIPPED WITH 02 RECTIFIER UNITS OF 1000W**
35510307 - Look at pg. 61

# GPON Equipment

## OPTICAL CONCENTRATOR CHASSIS GPON FK-OLT-G2500

User concentrator for PON LAN networks that use GPON technology (ITU-T G.984).

### Construtive Characteristics

| | |
|---|---|
| **Power Supply** | 48 VDC Redundant |
| **Operating temperature** | 0 ºC to 50 ºC |
| **Dimension** | 444 x 310 x 385 mm (7Us) |
| **Power Consumption** | 390 W |
| **Modules** | Hot Swappable |

### Technical Characteristics

| | | | |
|---|---|---|---|
| **Interfaces** | 10 slots for service modules | Service module with 4 ports GPON SFP | |
| | | Service module with 4 redundant ports GPON SFP | |
| | 2 slots for uplink module | Uplink module with 4 ports SFP GbE and 2 ports XFP 10GbE | |
| | 2 slots for switching and control module | | |
| | 2 slots for power supply 48 VDC | | |
| **GPON** | Standard GPON ITU-T G.984 | **Layer 2** | 32K MAC addresses |
| | 128 ONTs per PON interface (Up to 5120 per chassis) | | Support to VLANs |
| | 2.5 Gbps downstream and 1.25 Gbps upstream | | Spanning Tree (STP, RSTP, MSTP) |
| | 20 km reach (60 km maximum logical reach) | | Link aggregation |
| **Layer 3** | Static routing | **Security** | SSH v1/v2 |
| | RIP v1/v2, OSPF v2, BGP v4 | | 802.1x with RADIUS e TACACS+ |
| | VRRP | | Storm control |
| **QoS** | Dynamic bandwidth allocation | | Access control list for L2, L3 and L4 |
| | 8 queues per port | | |
| | Traffic scheduling (SP, WRR, DRR) | | |

### Part Number

| | |
|---|---|
| 35510205 | Optical Concentrator Chassis GPON FK-OLT-G2500 |
| 35510181 | Power Supply DC for Optical Concentrator Chassis GPON 7U |
| 35510182 | Blank Panel - Power Supply DC for Optical Concentrator Chassis GPON 7U |
| 35510307 | Power Supply - 48VDC Netsure 211 C23 with 2X 1000 W Rectifier Units and SCU+ Supervision Unit |
| 35510207 | Management and Switch Module for FK-OLT-G2500 |
| 35510184 | Blank Panel - Management and Switch Module for Optical Concentrator Chassis GPON 7U |
| 35510185 | Uplink Module with 2 10 GE Ports + 4 GE SFP Ports for Optical Concentrator Chassis GPON 7U |
| 35510186 | Blank Panel - Uplink Module for Optical Concentrator Chassis GPON 7U |
| 35510187 | Service Module with 4 SFP GPON Ports for Optical Concentrator Chassis GPON 7U |
| 35510188 | Service Module with 4 Redundant SFP GPON Ports for Optical Concentrator Chassis GPON 7U |
| 35510189 | Blank Panel - Service Module for Optical Concentrator Chassis GPON 7U |
| 35510197 | Transceiver SFP Class B+ 2.5 Gbps LR 1490 nm SC-UPC W/DDM (20 km) |
| 35510267 | Transceiver SFP 1GE SX 850 nm (550 m) |
| 35510268 | Transceiver SFP 1GE LX 1310 nm (10 km) |
| 35510269 | Transceiver SFP 1GE LX 1310 nm (20 km) |
| 35510270 | Transceiver SFP 1GE LX 1310 nm (40 km) |
| 35510272 | Transceiver XFP 10GE SR 850 nm (300 m) |
| 35510273 | Transceiver XFP 10GE LR 1310 nm (10 km) |
| 35510274 | Transceiver XFP 10GE ER 1550 nm (40 km) |

# OPTICAL CONCENTRATOR GPON FK-OLT-G4S

User concentrator for PON LAN networks that use GPON technology (ITU-T G.984).

## Construtive Characteristics

| | | |
|---|---|---|
| **Power supply** | Redundant AC full-range (100-240 V, 50/60 Hz) or 48VDC | |
| **Operating temperature** | 0 °C to 50 °C | |
| **Dimension** | Height | 44 mm |
| | Width | 440 mm |
| | Depth | 300 mm (1 U) |
| **Power consumption** | 50 W | |
| **Modules** | Hot Swappable | |

## Technical Characteristics

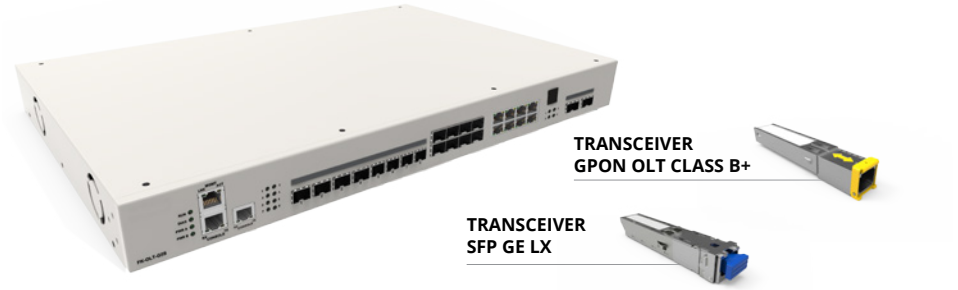
| | | | |
|---|---|---|---|
| **Interfaces** | 4 interfaces GPON SFP | **Management** | Serial/Telnet (CLI) |
| | 8 uplink interfaces GbE combo (RJ-45 + SFP) | | RMON |
| | 2 slots for redundant power supply | | SNMP |
| | Console and Ethernet management | | Compatibility with graphic interface |
| **GPON** | Standard GPON ITU-T G.984 | **Multicast** | IGMP v1/v2/v3 |
| | 128 ONTs per PON interface (Up to 512 per OLT) | | IGMP snooping |
| | 2.5 Gbps downstream and 1.25 Gbps upstream | | IGMP proxy |
| | 20 km reach (60 km maximum logical reach) | | Multicast VLAN registration |
| **Layer 2** | 16 K MAC addresses | **Security** | SSH v1/v2 |
| | Support to VLANs | | RADIUS and TACACS+ |
| | Spaning tree (STP, RSTP, MSTP) | | Storm control |
| | Link agreggation | | Access control list for L2, L3 and L4 |
| **Layer 3** | Static routing | **QoS** | Dynamic bandwidth allocation |
| | RIP v1/v2, OSPF v2, BGP v4 | | 8 priority lines per port |
| | VRRP | | Traffic scheduling (SP, WRR, DRR) |

## Part Number

| | |
|---|---|
| 35510190 | Standalone Optical Concentrator GPON FK-OLT-G4S |
| 35510191 | Power Supply AC for GPON Standalone Optical Concentrator |
| 35510192 | Power Supply DC for GPON Standalone Optical Concentrator FK-OLT-G4S |
| 35510197 | Transceiver SFP Class B+ 2.5 Gbps LR 1490 nm SC-UPC W/DDM (20 km) |
| 35510267 | Transceiver SFP 1GE SX 850 nm (550 m) |
| 35510268 | Transceiver SFP 1GE LX 1310 nm (10 km) |
| 35510269 | Transceiver SFP 1GE LX 1310 nm (20 km) |
| 35510270 | Transceiver SFP 1GE LX 1310 nm (40 km) |

# GPON STANDALONE OPTICAL CONCENTRATOR FK-OLT-G8S

GPON Standalone Optical Concentrator with 8 service interfaces and redundant AC/DC power supply. Capacity for up to 1024 ONTs.




## Constructive Characteristics

| | | |
|---|---|---|
| **Power supply** | How Swappable and Redundant full-range AC (100-240 V, 50/60 Hz) or -48/60 VDC | |
| **Operating Temperature** | –20 °C to 60 °C | |
| **Dimensions** | Height | 43 mm |
| | Width | 432 mm |
| | Depth | 320 mm (1 U) |
| **Consumption** | 70 W | |

## Technical Characteristics

| | | | |
|---|---|---|---|
| **Interfaces** | 8 GPON SFP interfaces | **QoS** | Conditional band limiting |
| | 8 uplink 1 GE combo interfaces (RJ-45 + SFP) + 2 10 GE SFP+ | **Management** | Serial/Telnet (CLI) |
| | 2 slots for redundant power supplies | | RMON |
| **GPON** | Standard GPON ITU-T G.984 | | SNMP |
| | 128 ONTs per PON interface (up to 1024 per OLT) | **Multicast** | IGMP v1/v2/v3 |
| | 2.5 Gbps for downstream and 1.25 Gbps for Upstream | | IGMP snooping |
| | Maximum logical distance of 60 km | | IGMP proxy |
| **Layer 2** | Support up to 4K Vlans | | Multicast VLAN registration |
| | Spanning tree (STP, RSTP, MSTP) | **Security** | MAC Based Authentication |
| | Link aggregation | | RADIUS and TACACS+ |
| **Layer 3** | Static routing | | Storm control |
| | RIP v1/v2, OSPF v2, BGP v4 | | Access control list for L2, L3 y L4 |
| | VRRP | | |

## Part number

| | |
|---|---|
| 35510249 | GPON Standalone Optical Concentrator FK-OLT-G8S |
| 35510191 | Power Supply AC for GPON Standalone Optical Concentrator |
| 35510197 | Transceiver Sfp Classe B+ 2.5Gbps LR 1490nm SC-UPC W/ DDM (20 km) |
| 35510268 | Transceiver SFP 1GE LX 1310nm (10 km) |
| 35510269 | Transceiver SFP 1GE LX 1310nm (20 km) |
| 35510270 | Transceiver SFP 1GE LX 1310nm (40 km) |
| 35510271 | Transceiver SFP+ 10GE SX 1310nm (10 km) |
| 35510251 | Power Cord 1.5 m Nema/IEC C13 Standard |

# OPTICAL MODEM GPON FK-ONT-G420R

The ONT GPON FK-ONT-G420R is a terminal equipment compatible with ITU-T G.984 standard.

## Construtive Characteristics

| | |
|---|---|
| **Width** 160 mm x **Height** 40 mm x **Depth** 125 mm **Color** Black | |
| **Power supply** | 12 VDC with AC/DC full-range adapter included |
| **Operating temperature** | 0 °C to 50 °C |

## Technical Characteristics

| | |
|---|---|
| **Interfaces** | 1 optical interface GPON SC-APC |
| | 4 copper interfaces Gigabit Ethernet RJ-45 |
| | 2 interfaces POTs RJ-11 |
| **GPON** | Standard GPON ITU-T G.984 |
| | 2.5 Gbps downstream and 1.25 Gbps upstream |
| | 20 km reach (60 km maximum logical reach) |
| | Multiple T-CONTs and GEM Ports |
| **Layer 2** | Up to 128 MAC addresses |
| | Support to spanning tree protocol |
| | Marking/Remarking 802.1p |
| **Layer 3** | PPPoE Client |
| | NAT and NAPT |
| | Server DHCP |
| **QoS** | Bandwidth adjustable from OLT |
| | 8 priority lines per port |
| **Management** | Management and provisioning through OLT |
| | Auto discovery |
| | Provisioning via RADIUS |
| | Remote firmware actualization |
| **Multicast** | IGMP snooping |

## Part Number

| | |
|---|---|
| 35510167 | Optical Modem GPON FK-ONT-G420R |
| 35510228 | Power Supply for Optical Modem NEMA Standard |

## OPTICAL MODEM GPON FK-ONT-G400B/POE S2

The ONT GPON FK-ONT-G400B/PoE is a termination equipment with PoE power supply and is compatible with ITU-T G.984 standard.

### Construtive Characteristics

| | |
|---|---|
| **Width** 209 mm x **Height** 40 mm x **Depth** 130 mm **Color** Black | |
| **Power supply** | 48 VDC |
| **Operation temperature** | 0 °C to 40 °C |

### Technical Characteristics

| | | | |
|---|---|---|---|
| **Interfaces** | 1 optical interface GPON SC-APC | **QoS** | Bandwidth adjustable through OLT |
| | 4 copper interfaces Gigabit Ethernet RJ-45 | | 8 priority lines per port |
| | 1 interface UPS 8-pins | **Management** | Management and provisioning through OLT |
| **GPON** | Standard GPON ITU-T G.984 | | Auto discovery |
| | 2.5 Gbps downstream and 1.25 Gbps upstream | | Remote firmware actualization |
| | 20 km reach | **Multicast** | IGMP snooping |
| | Multiple T-CONTs and GEM ports | | Limiter of rate broadcast/multicast |
| **Layer 2** | Up to 512 MAC addresses | **PoE characteristics** | Compatible with IEEE 802.3af-2003 and 802.3at-draft 3.1 |
| | Up to 32 VLAN groups | | PD (powered device) devices standard retention |
| | Marking/Remarking 802.1p | | Maximum power per ONT for PoE ports = 80 Watts |

### Part Number

| | |
|---|---|
| 35510259 | Optical Modem GPON FK-ONT-G400B/PoE S2 |
| 35510263 | Power Supply Adapter Standard NEMA S-ISP for FK-ONT-G400B/PoE S2 |

# Splitters

## MODULAR OPTICAL SPLITTER 19"

Designed for plug-and-play applications, completely pre-terminated splitter that can be installed in 19" racks.

### Construtive Characteristics

| | |
|---|---|
| **Width** 494 mm (19") x **Height** 43.5 mm x **Depth** 341.3 mm **Color** Black | |
| **Manufacturing technology** | PLC |
| **Connector type** | SC-APC |
| **Entrance** | 1 or 2 (for redundancy) |

### Performance

| | | | |
|---|---|---|---|
| **Splitter type** | 1x32 | 1x64 | 2 x 32 |
| **Maximum insertion loss (dB)** | 17.1 | 20.5 | 17.7 |
| **Uniformity (dB)** | 1.5 | 1.7 | 2.1 |
| **Maximum polarization dependent loss (PDL) (dB)** | 0.4 | 0.5 | 0.4 |
| **Optical bandwidth** | 1260~1650 nm | | |
| **Directivity** | > 55 dB | | |
| **Return Loss** | > 55 dB | | |
| **Maximum return loss per connection** | >60dB | | |
| **Optical attenuation per connection (dB)** | 0.15 (typical) and 0.3 (maximum) | | |

### Part Number

| | |
|---|---|
| 35500035 | Modular Optical Splitter 19" 1 X 1 X 32 G.657A SC-APC/SC-APC |
| 35500036 | Modular Optical Splitter 19" 2 X 1 X 32 G.657A SC-APC/SC-APC |
| 35500037 | Modular Optical Splitter 19" 1 X 2 X 32 G.657A SC-APC/SC-APC |
| 35500038 | Modular Optical Splitter 19" 1 X 1 X 64 G.657A SC-APC/SC-APC |

## LGX MODULAR OPTICAL SPLITTER

Pre-terminated splitter compatible with LGX standard.

### Construtive Characteristics

| | |
|---|---|
| **Width** 101.5 mm x **Height** 29.5 mm x **Depth** 129.6 mm | **Color** Black |
| **Optical adapter** | SC |
| **Polish type** | APC |

### Performance

| | | | |
|---|---|---|---|
| **Splitter type** | 1x2 | 1x4 | 1x8 |
| **Maximum insertion loss (dB)** | 3.7 | 7.1 | 10.5 |
| **Uniformity (dB)** | 0.5 | 0.6 | 1 |
| **Maximum polarization dependent loss (PDL) (dB)** | 0.2 | 0.2 | 0.23 |
| **Directivity** | > 55dB | | |
| **Return Loss** | > 55dB | | |
| **Optical Bandwidth** | PLC: 1260~1650 nm | | |
| | FBT:1260~1360 nm and 1480~1580 nm | | |

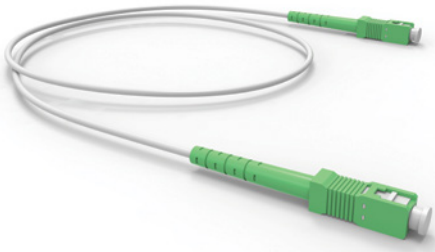
### Part Number

| | |
|---|---|
| 35500159 | LGX Modular Optical Splitter 1X2 50/50 G.657A SC-APC/SC-APC |
| 35500160 | LGX Modular Optical Splitter 1X4 G.657A SC-APC/SC-APC |
| 35500161 | LGX Modular Optical Splitter 1X8 G.657A SC-APC/SC-APC |

# Pre-Terminated Optical Cables

## TRUNK CABLE 01F BLI G.657B

Pre-terminated optical cable for horizontal cabling.



### Construtive Characteristics

| | |
|---|---|
| **Nominal diameter** | 3.8 mm |
| **Fiber type** | Bending Loss Insensitive |
| **Connector type** | SC-APC |

### Part Number

| | |
|---|---|
| 33001088 | Trunk Cable Pre-Terminated 01F BLI A/B G-657B SC-APC/SC-APC D3.8 35.0m - Tight - White - LSZH |
| 33001108 | Trunk Cable Pre-Terminated 01F BLI A/B G-657B SC-APC/SC-APC D3.8 45.0m - Tight - White - LSZH |
| 33001109 | Trunk Cable Pre-Terminated 01F BLI A/B G-657B SC-APC/SC-APC D3.8 55.0m - Tight - White - LSZH |
| 33001110 | Trunk Cable Pre-Terminated 01F BLI A/B G-657B SC-APC/SC-APC D3.8 65.0m - Tight - White - LSZH |

# Termination Accessories

## INTERNAL OPTICAL DISTRIBUTION BOX - Slimbox 12F

Optical distribution box for cabling consolidation point.

### Construtive Characteristics

| | |
|---|---|
| **Width** 123 mm x **Height** 149 mm x **Depth** 49 mm **Color** Light Gray | |
| **Cable type** | Tight buffer, loose tube and micro modules |
| **Fiber type** | Single-Mode G-652B, G.652D or G.657.A |
| **Positions amount** | 12 port capacity for pigtails with 2, 3 or 5.3 mm diameter |
| **Product body material** | Thermoplastic |

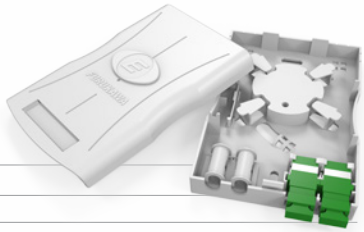
### Part Number

| | |
|---|---|
| 35261167 | Slimbox 12-Fiber Distribution Module (CDOI 12 - B |

# Termination Point

## OPTICAL ROSETTE 2P 4X2

Utilized as termination point of optical network for indoor environments.



### Construtive Characteristics

| | |
|---|---|
| **Width** 79.8 mm x **Height** 114.9 mm x **Depth** 22.5 mm **Color** White | |
| **Connector type** | SC |
| **Polishing type** | APC or PC (UPC or SPC) |
| **Ports capacity** | 2 placeholder for splices or mechanical splices |
| | 2 port capacity for SC simplex or LC duplex adapters |
| **Product body material** | Plastic ABS |

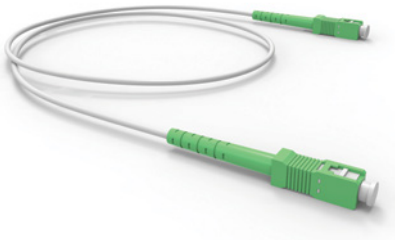
### Part Number

| | |
|---|---|
| 35250168 | Optical Rosette 2P 4X2 - White |

# Optical Cords and Pigtails

## SIMPLEX OPTICAL PATCH CORD SINGLE-MODE

Optical patch cord utilized for connection of termination point to ONT.



### Construtive Characteristics

| | |
|---|---|
| **Nominal diameter** | 2 mm and 3 mm |
| **Length** | From 1.5 to 20 m |

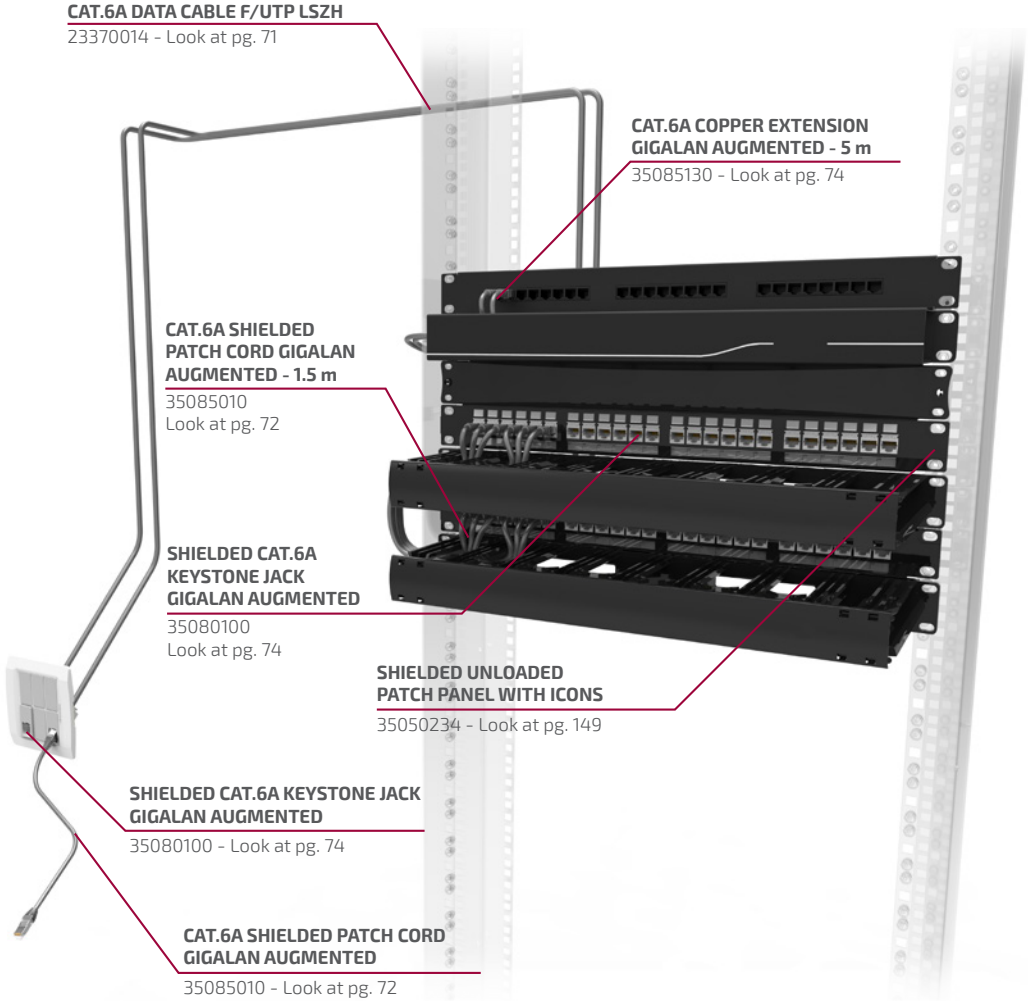
### Part Number

| | |
|---|---|
| 33006401 | Simplex Optical Patch Cord BLI A/B G-657A SC-APC/SC-APC 2.5 m - LSZH - White - D3 |
| 33006400 | Simplex Optical Patch Cord BLI A/B G-657A SC-APC/SC-UPC 2.5 m - LSZH - White - D3 |
| 33001734 | Simplex Optical Patch Cord SM G-652D SC-APC/SC-APC 2.5 m - OFN - Yellow - D3 |
| 33000373 | Simplex Optical Patch Cord SM G-652D SC-APC/SC-UPC 10.0 m - OFN - Yellow - D3 |
| 35241076 | Simplex Optical Pigtail BLI A/B G-657A SC-APC 20.0 m - LSZH - White - D3 |

**FTP Channel**
**UTP Channel**

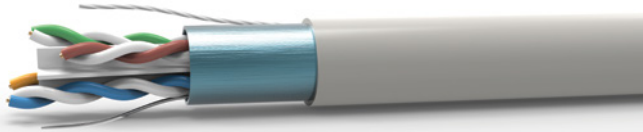
# GigaLan Augmented

# FTP Channel


CAT.6A DATA CABLE F/UTP LSZH
23370014 - Look at pg. 71
CAT.6A COPPER EXTENSION GIGALAN AUGMENTED - 5 m
35085130 - Look at pg. 74
CAT.6A SHIELDED PATCH CORD GIGALAN AUGMENTED - 1.5 m
35085010
Look at pg. 72
SHIELDED CAT.6A KEYSTONE JACK GIGALAN AUGMENTED
35080100
Look at pg. 74
SHIELDED UNLOADED PATCH PANEL WITH ICONS
35050234 - Look at pg. 149
SHIELDED CAT.6A KEYSTONE JACK GIGALAN AUGMENTED
35080100 - Look at pg. 74
CAT.6A SHIELDED PATCH CORD GIGALAN AUGMENTED
35085010 - Look at pg. 72

# SHIELDED DATA CABLE GIGALAN AUGMENTED CAT.6A F/UTP 23 AWG X 4P

Cable for connections between patch panels in technical rooms and connectors at work area.



## Constructive Characteristics

| | |
|---|---|
| **Shielding** | Metalized polyester tape |
| **Color** | PVC ROHS: Gray, red or black |
| | LSZH: Green or gray |
| **Nominal diameter** | 7.5 mm |
| **Cable weight** | 58 kg/km |
| **Flammability class** | CM - UL 1581 - Vertical tray Section 1160 (UL1685) |
| | CMR - UL 1666 (Riser) |
| | LSZH - IEC 60332-3 |
| **Number of pairs** | 4 pairs, 23 AWG |
| **Installation temperature** | From 0 °C to 50 °C |
| **Storage temperature** | -20 °C up to 75 °C |
| **Operation temperature** | -20 °C up to 60 °C |

## Performance

| | |
|---|---|
| **Maximum unbalance resistance** | 4 % |
| **Conductor maximum DC electric resistance at 20°C** | 93.8 Ω/km |
| **Maximum mutual capacitance 1kHz** | 56 pF/m |
| **Maximum unbalance capacitance pair x ground** | 3.3 pF/m |
| **Characteristic impedance** | 100 ± 15 % Ω |
| **Maximum propagation delay** | 545 ns/100 m @ 10 MHz |
| **Maximum delay skew** | 45 ns/100 m |
| **Electric voltage between conductors test** | 2500 VDC/3 s |
| **Electric voltage between conductors and shielding test** | 500 VDC/3 s |
| **NVP** | 68 % |
| **Insulation resistance** | 10000 MΩ.km |

## Package

| | |
|---|---|
| Wood reel | |
| Standard cable run | 305 m/1000m |

## Part Number

| | | |
|---|---|---|
| 23370014 | F/UTP | LSZH |
| 23370005 | | CMR |

| Freq. (MHz) | Attenuation (dB) | | NEXT (dB) | | PSNEXT (dB) | | ACRF (dB) | | PSACRF (dB) | | RL (dB) | | PSANEXT (dB) | | PSAACRF (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Max. | Typical | Min. | Typical | Min. | Typical | Min. | Typical | Min. | Typical | Min. | Typical | Min. | Typical | Min. | Typical |
| 1 | 2.1 | 1.6 | 74.3 | 104.6 | 72.3 | 91.4 | 67.8 | 100.8 | 64.8 | 93.8 | 20.0 | 35.4 | 67.0 | 90.0 | 67.0 | 88.0 |
| 4 | 3.8 | 3.2 | 65.3 | 93.8 | 63.3 | 80.2 | 55.8 | 95.6 | 52.8 | 88.4 | 23.0 | 37.2 | 67.0 | 90.8 | 66.2 | 87.3 |
| 8 | 5.3 | 4.8 | 60.8 | 91.3 | 58.8 | 78.0 | 49.7 | 89.4 | 46.7 | 81.8 | 24.5 | 42.3 | 67.0 | 92.8 | 60.1 | 87.0 |
| 10 | 5.9 | 5.3 | 59.3 | 95.6 | 57.3 | 73.8 | 47.8 | 87.4 | 44.8 | 77.7 | 25.0 | 36.9 | 67.0 | 92.4 | 58.2 | 87.1 |
| 16 | 7.5 | 6.7 | 56.2 | 79.9 | 54.2 | 72.6 | 43.7 | 80.8 | 40.7 | 71.3 | 25.0 | 40.5 | 67.0 | 91.9 | 54.1 | 84.7 |
| 20 | 8.4 | 7.7 | 54.8 | 82.1 | 52.8 | 71.8 | 41.8 | 77.9 | 38.8 | 69.6 | 25.0 | 39.9 | 67.0 | 85.3 | 52.2 | 79.3 |
| 25 | 9.4 | 8.7 | 53.3 | 85.9 | 51.3 | 72.8 | 39.8 | 76.6 | 36.8 | 67.4 | 24.3 | 38.2 | 67.0 | 86.5 | 50.2 | 77.8 |
| 31.3 | 10.5 | 9.6 | 51.9 | 75.3 | 49.9 | 69.4 | 37.9 | 74.6 | 34.9 | 65.8 | 23.6 | 39.5 | 67.0 | 86.2 | 48.3 | 76.9 |
| 62.5 | 15.0 | 13.8 | 47.4 | 68.6 | 45.4 | 60.8 | 31.9 | 64.0 | 28.8 | 58.4 | 21.5 | 31.3 | 65.6 | 85.6 | 42.3 | 72.3 |
| 100 | 19.1 | 17.6 | 44.3 | 66.5 | 42.3 | 61.0 | 27.8 | 60.3 | 24.8 | 53.7 | 20.1 | 31.2 | 62.5 | 86.6 | 38.2 | 68.9 |
| 200 | 27.6 | 25.2 | 39.8 | 63.3 | 37.8 | 56.2 | 21.8 | 57.5 | 18.8 | 50.8 | 18.0 | 30.2 | 58.0 | 83.6 | 32.2 | 60.5 |
| 250 | 31.1 | 28.4 | 38.3 | 59.5 | 36.3 | 53.8 | 19.8 | 50.5 | 16.8 | 44.8 | 17.3 | 26.2 | 56.5 | 83.9 | 30.2 | 56.9 |
| 300 | 34.3 | 31.1 | 37.1 | 59.2 | 35.1 | 51.9 | 18.3 | 49.8 | 15.3 | 44.2 | 16.8 | 29.5 | 55.3 | 81.8 | 28.7 | 52.8 |
| 400 | 40.1 | 36.3 | 35.3 | 57.6 | 33.3 | 49.6 | 15.8 | 49.7 | 12.8 | 42.3 | 15.9 | 26.5 | 53.5 | 79.7 | 26.2 | 46.8 |
| 500 | 45.3 | 40.7 | 33.8 | 54.4 | 31.8 | 48.6 | 13.8 | 43.2 | 10.8 | 35.4 | 15.2 | 21.8 | 52.0 | 76.7 | 24.2 | 38.6 |

Additional configurations available on request.

# F/UTP CAT.6A SHIELDED PATCH CORD GIGALAN AUGMENTED

Accessory for connections in telecommunication rooms (cross-connect) and work areas.

## Constructive Characteristics

| | |
|---|---|
| **Length** | From 0.5 to 20 m |
| **Nominal diameter** | 6 mm |
| **Weight** | 0.034 kg/m |
| **Color** | Blue, gray or red |
| **Connector type** | RJ-45 shielded |
| **Cable type** | CAT.6A F/UTP |
| **Conductor type** | Electrolytic copper, flexible, bare, composed by 7 wires of nominal diameter 0.2 mm |
| **Flammability class** | CM (standard supply), LSZH (CM) |
| **Cable shielding** | F/UTP (Overall twisted pairs foiled with aluminum polyester tape) |
| **Number of pairs** | 4 pairs, 26 AWG |
| **Electric contact material** | 8 pins in phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Product body material** | Flame retardant transparent thermoplastic UL 94 V-0 |
| **Assembly type** | T568A, T568B or crossover |

## Performance

| | |
|---|---|
| **Conductor maximum DC electric resistance at 20°C** | 140 Ω/km |
| **Maximum mutual capacitance 1kHz** | 56 pF/m |
| **Characteristic impedance** | 100±15% Ω |
| **Electric voltage between conductors and shielding test** | 1250 VDC/3 s |
| **NVP** | 66 % |
| **Maximum propagation delay** | 45 ns/100 m |

## Part Number

| | | | | |
|---|---|---|---|---|
| 35085010 | 1.5 m | Gray | T568-A/B | CM |
| 35085011 | 2.5 m | | | |
| 35085016 | 3 m | | | |
| 35085117 | 4 m | | | |
| 35085012 | 5 m | | | |
| 35085132 | 1.5 m | | | LSZH |
| 35085119 | 2.5 m | | | |
| 35085040 | 3 m | | | |

Additional configurations available on request.

# S/FTP CAT.6A DOUBLE SHIELDED PATCH CORD GIGALAN AUGMENTED

## Constructive Characteristics

| | |
|---|---|
| **Length** | From 0.5 to 20 m |
| **Nominal diameter** | 6.8 mm |
| **Weight** | 0.034 kg/m |
| **Color** | Gray |
| **Connector type** | RJ-45 CAT.6A shielded |
| **Cable type** | CAT.6A S/FTP |
| **Conductor type** | Electrolytic copper, flexible, bare, composed by 7 wires of nominal diameter 0.2 mm |
| **Flammability class** | LSZH |
| **Cable shielding** | S/FTP (twisted pair foiled with aluminum polyester tape and overall pairs with tinned copper braid screen) |
| **Number of pairs** | 4 pairs, 26 AWG |
| **Electric contact material** | 8 pins in phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Product body material** | Flame retardant transparent thermoplastic UL 94 V-0 |
| **Assembly type** | T568A, T568B or crossover |

## Performance

| | |
|---|---|
| **Conductor maximum DC electric resistance at 20°C** | 145 Ω/km |
| **Maximum mutual capacitance 1kHz** | 56 pF/m |
| **Characteristic impedance** | 100±15% Ω |
| **NVP** | 65 % |
| **Maximum propagation delay** | 25 ns/100 m |

## Part Number

| | | | |
|---|---|---|---|
| 35085182 | 1.5 m | Gray | LSZH |
| 35085183 | 2.5 m | | |
| 35085184 | 5.0 m | | |

# F/UTP CAT.6A SHIELDED COPPER EXTENSION GIGALAN AUGMENTED

Accessory for performing connection in telecommunication rooms and for service distribution in horizontal cabling (consolidation point).

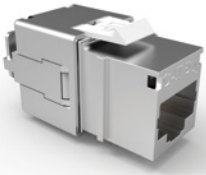
## Constructive Characteristics

| | |
|---|---|
| **Length** | From 0.5 to 20 m |
| **Nominal diameter** | 6.3 mm |
| **Color** | Gray and red |
| **Connector type** | RJ-45 (ET) |
| **Cable type** | CAT. 6A F/UTP |
| **Conductor type** | Electrolytic copper, flexible, bare, composed by 7 wires of nominal diameter 0.2 mm |
| **Flammability class** | CM, LSZH |
| **Number of pairs** | 4 pairs, 26 AWG |

## Part Number

| | | | |
|---|---|---|---|
| 35085105 | 2.5 m | Gray | CM |
| 35085106 | 5 m | | |
| 35085107 | 10 m | | |
| 35085130 | 5 m | | LSZH |
| 35085144 | 10 m | | |

# SHIELDED CAT.6A KEYSTONE JACK GIGALAN AUGMENTED



Accessory for performing connection in telecommunication rooms and work areas.

## Constructive Characteristics

| | |
|---|---|
| **Color** | Silver |
| **Connector type** | RJ-45 |
| **Electric contact material** | Phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Conductor diameter** | 22 to 26 AWG |
| **Assembly type** | T568A and T568B |
| **Cable angle** | 0° and/or 180° |

## Performance

| | |
|---|---|
| **Retention force between jack and plug** | Minimum 133 N |
| **Number of cycles** | ≥750 RJ-45 and ≥200 RJ-11 |
| | ≥200 in IDC block |
| **Insulation resistance** | 500 MΩ |
| **Contact resistance** | 20 mΩ |
| **Maximum DC resistance** | 0.2 Ω |
| **Applied electrical voltage test** | 1000 V (RMS, 60 Hz, 1 min) |
| **Contact force** | 0.98 N (100 g) |

## Part Number

| | |
|---|---|
| 35080100 | Shielded CAT.6A Keystone Jack T568A/B GigaLan Augmented |

# F/UTP CAT.6A SHIELDED PRE-TERMINATED CABLE GIGALAN AUGMENTED

Accessory for fast interconnection between EDA and HDA in Data Centers.

## Constructive Characteristics

| | |
|---|---|
| **Color** | Gray |
| **Connector type** | Shielded keystone jack |
| **Cable type** | Data cable GigaLan Augmented CAT.6A 23AWG x4P F/UTP CZ LSZH |
| **Positions amount** | 6 |
| **Included accessories** | Connector dust cover |

## Package

| | |
|---|---|
| Carton box | Up to 25 meters (2 pieces per package) |
| Reel + Carton box | More than 25 meters (1 piece per package) |
| Minimum and multiple lot | 1 box |

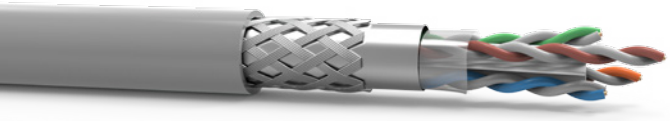
## Part Number

| | |
|---|---|
| 35085188 | Pre-Terminated Cable 6X CAT.6A F/UTP CZ LSZH T568A 5.0 m ES 1.0 m Female - 1.0 m Female |

Additional configurations available on request.

# DATA CABLE GIGALAN AUGMENTED CAT.6A SF/UTP 23AWG X 4P

Data cable for performing connections between patch panels and connectors at work areas.



## Constructive Characteristics

| | |
|---|---|
| **Shielding SF/UTP** | Overall twisted pairs with aluminum polyester foiled and tinned copper braid screen |
| **Color** | PVC ROHS: Gray or Blue |
| | LSZH: Green or Gray |
| **Nominal diameter** | 8 mm |
| **Cable weight** | 64 kg/km |
| **Flammability class** | CM: standard UL 1581-Vertical tray Section 1160 (UL-1685) |
| | CMR: standard UL 1666 (Riser) |
| | LSZH (CM) |
| **Number of pairs** | 4 pairs, 23 AWG |
| **Installation temperature** | From 0 °C to 50 °C |
| **Storage temperature** | From -20 °C to +75 °C |
| **Operation temperature** | From -20 °C to +60 °C |

## Performance

| | |
|---|---|
| **Maximum unbalance resistance** | 4 % |
| **Conductor maximum DC electric resistance at 20°C** | 93.8 Ω/km |
| **Maximum mutual capacitance 1kHz** | 56 pF/m |
| **Maximum unbalance capacitance pair x ground** | 3.3 pF/m |
| **Characteristic impedance** | 100 ± 15 % Ω |
| **Maximum propagation delay** | 545 ns/100 m @ 10 MHz |
| **Maximum delay skew** | 45 ns/100 m |
| **Electric voltage between conductors test** | 2500 VDC/3 s |
| **Electric voltage between conductors and shielding test** | 500 VDC/3 s |
| **NVP** | 68 % |
| **Isolation resistance** | 10000 MΩ.km |

## Package

| | |
|---|---|
| Wood reel | |
| Standard cable run | 1000 m / 305 m |

## Certifications

| | |
|---|---|
| ETL Verified | 101132445 |
| UL Listed | E160837 |

## Part Number

| | |
|---|---|
| 23370050 | Data Cable GigaLan Augmented CAT. 6A SF/UTP 23AWGX4P LSZH Gray (305 m) |
| 23370056 | Data Cable GigaLan Augmented CAT. 6A SF/UTP 23AWGX4P CM Gray (305 m) |
| 23370057 | Data Cable GigaLan Augmented CAT. 6A SF/UTP 23AWGX4P CMR Gray (305 m) |

Additional configurations available on request.

# DATA CABLE GIGALAN AUGMENTED CAT.7A S/FTP 23 AWG X 4P

Data cable for performing connections between patch panels in technical rooms and connectors at work areas.

## Constructive Characteristics

| | |
|---|---|
| **Shielding S/FTP** | Twisted pair foiled with aluminum polyester tape and overall pairs with tinned copper braid screen |
| **Color** | LSZH: Gray |
| | Additional colors on request |
| **Nominal diameter** | 7.9 mm |
| **Cable weight** | 61 kg/km |
| **Flammability class** | LSZH: Should comply with IEC 60332 Part 3-25: "Test for vertical flame spread of LSZH vertically mounted bunched wires or cables" |
| **Number of pairs** | 4 pairs, 23 AWG |
| **Installation temperature** | From 0 °C to 50 °C |
| **Storage temperature** | From -20 °C to +75 °C |
| **Operation temperature** | From -20 °C to +60 °C |

## Performance

| | |
|---|---|
| **Maximum unbalance resistance** | 2 % |
| **Conductor maximum DC electric resistance at 20°C** | 73.2 Ω/km |
| **Maximum mutual capacitance 1kHz** | 56 pF/m |
| **Maximum unbalance capacitance pair x ground** | 1.6pF/m |
| **Characteristic impedance** | 100 ± 15 % Ω |
| **Maximum propagation delay** | 545 ns/100 m @ 10 MHz |
| **Maximum delay skew** | 25ns/100m |
| **Electric voltage between conductors test** | 2500 VDC/3 s |
| **NVP** | 65 % |
| **Insulation resistance** | 5000 MΩ.km |

## Package

| | |
|---|---|
| Wood reel | |
| Standard cable run | 305 m |

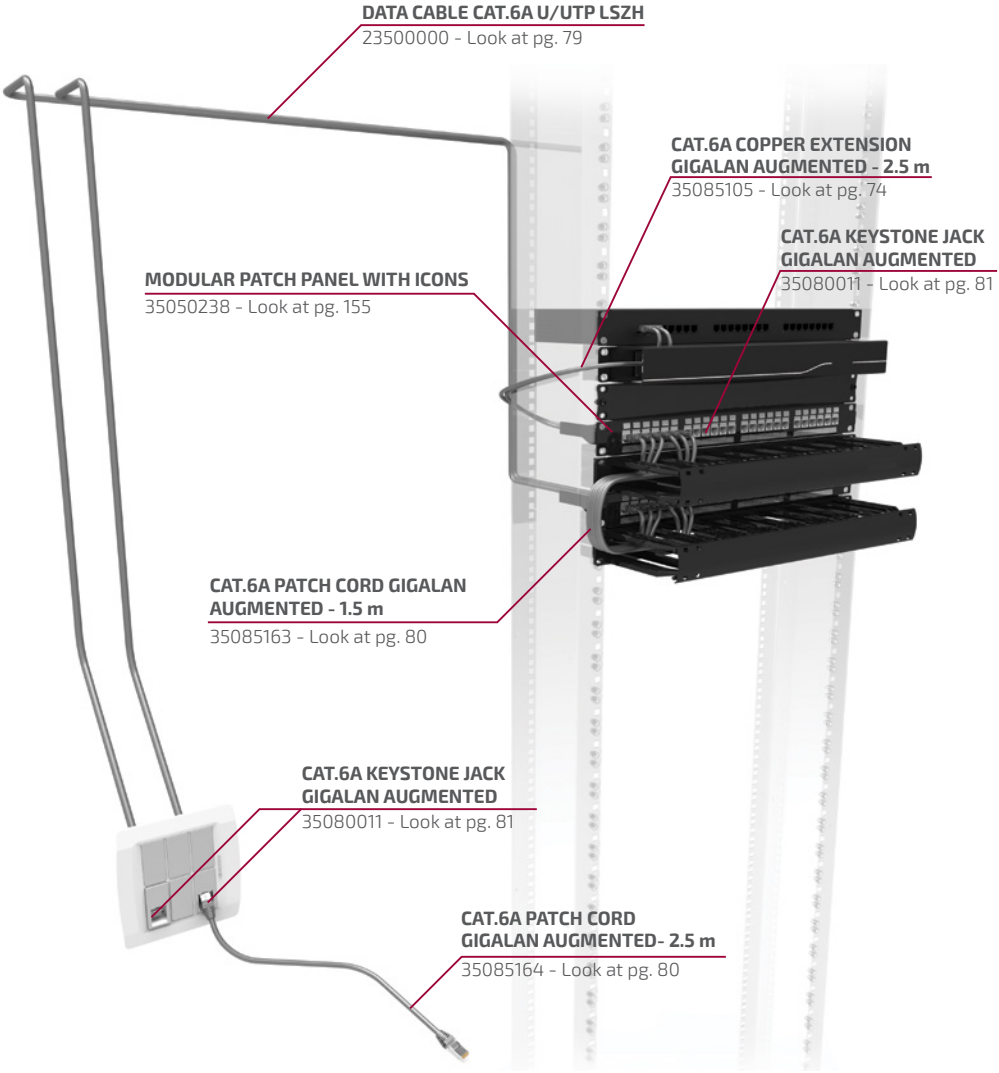
## Part Number

| | |
|---|---|
| 23380001 | Data Cable GigaLan Augmented CAT.7A S/FTP 23AWGX4P LSZH Gray 305 m |

| Freq., MHz | Att., max dB | NEXT, min dB worst pair | PS NEXT, min dB worst pair | ELFEXT, min dB worst pair | PS ELFEXT, min dB worst pair | Prop Delay, max dB | RL, min dB | Charact. Impedance Upper limit, Ohms | Charact. Impedance Lower limit, Ohms | Coupling Att., min dB |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 3.7 | 78.0 | 75.0 | 78.0 | 75.0 | 552.0 | 23.0 | 115.2 | 86.8 | - |
| 8 | 5.2 | 78.0 | 75.0 | 77.2 | 74.2 | 546.7 | 24.5 | 112.6 | 88.8 | - |
| 10 | 5.8 | 78.0 | 75.0 | 75.3 | 72.3 | 545.4 | 25.0 | 111.9 | 89.4 | - |
| 16 | 7.3 | 78.0 | 75.0 | 71.2 | 68.2 | 543.0 | 25.0 | 111.9 | 89.4 | - |
| 20 | 8.2 | 78.0 | 75.0 | 69.3 | 66.3 | 542.0 | 25.0 | 111.9 | 89.4 | - |
| 25 | 9.2 | 78.0 | 75.0 | 67.3 | 64.3 | 541.2 | 24.3 | 112.9 | 88.5 | - |
| 31.25 | 10.3 | 78.0 | 75.0 | 65.4 | 62.4 | 540.4 | 23.6 | 114.1 | 87.7 | 85.0 |
| 62.5 | 14.6 | 78.0 | 75.0 | 59.4 | 56.4 | 538.6 | 21.5 | 118.3 | 84.5 | 85.0 |
| 100 | 18.5 | 75.4 | 72.4 | 55.3 | 52.3 | 537.6 | 20.1 | 121.9 | 82.0 | 85.0 |
| 150 | 22.8 | 72.8 | 69.8 | 51.8 | 48.8 | 536.9 | 18.9 | 125.7 | 79.6 | 81.5 |
| 200 | 26.5 | 70.9 | 67.9 | 49.3 | 46.3 | 536.5 | 18.0 | 128.8 | 77.6 | 79.0 |
| 250 | 29.7 | 69.4 | 66.4 | 47.3 | 44.3 | 536.3 | 17.3 | 131.5 | 76.0 | 77.0 |
| 300 | 32.7 | 68.2 | 65.2 | 45.8 | 42.8 | 536.1 | 16.8 | 131.6 | 76.0 | 75.5 |
| 500 | 42.8 | 64.9 | 61.9 | 41.3 | 38.3 | 535.6 | 15.2 | 131.6 | 76.0 | 71.0 |
| 600 | 47.1 | 63.7 | 60.7 | 39.7 | 36.7 | 535.5 | 17.3 | 131.6 | 76.0 | 69.4 |
| 800 | 54.9 | 61.9 | 58.9 | 37.2 | 34.2 | 535.3 | 16.1 | 137.4 | 72.8 | 66.9 |
| 1000 | 61.9 | 60.4 | 57.4 | 35.3 | 32.3 | 535.1 | 15.1 | 142.8 | 70.0 | 65.0 |

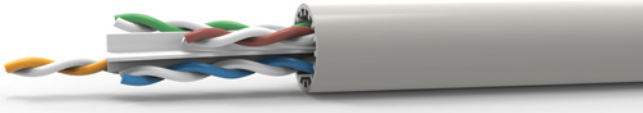
Additional configurations available on request.

# UTP Channel


DATA CABLE CAT.6A U/UTP LSZH
23500000 - Look at pg. 79
CAT.6A COPPER EXTENSION GIGALAN AUGMENTED - 2.5 m
35085105 - Look at pg. 74
CAT.6A KEYSTONE JACK GIGALAN AUGMENTED
35080011 - Look at pg. 81
MODULAR PATCH PANEL WITH ICONS
35050238 - Look at pg. 155
CAT.6A PATCH CORD GIGALAN AUGMENTED - 1.5 m
35085163 - Look at pg. 80
CAT.6A KEYSTONE JACK GIGALAN AUGMENTED
35080011 - Look at pg. 81
CAT.6A PATCH CORD GIGALAN AUGMENTED- 2.5 m
35085164 - Look at pg. 80

# DATA CABLE GIGALAN AUGMENTED CAT.6A U/UTP 23AWG X 4P

Cable for connection between patch panel in technical rooms and connectors at work area.



## Constructive Characteristics

| | |
|---|---|
| **Shielding** | Not shielded |
| **Color** | PVC RoHS: Gray |
| | LSZH: Gray or green |
| **Nominal diameter** | 8.6 mm |
| **Cable weight** | 61 kg/km |
| **Flammability class** | CM - UL 1581 - Vertical tray section 1160 (UL 1685) |
| | CMR - UL 1666 (Riser) |
| | LSZH - IEC 60332-3 |
| | LSZH-1 - IEC 60332-1 |
| **Number of pairs** | 4 pairs, 23 AWG |
| **Installation temperature** | From 0 °C to 50 °C |
| **Storage temperature** | From -20 °C to 75 °C |
| **Operation temperature** | From -20 °C to 60 °C |

## Performance

| | |
|---|---|
| **Maximum unbalance resistance** | 4 % |
| **Conductor maximum DC electric resistance at 20°C** | 93.8 Ω/km |
| **Maximum mutual capacitance 1kHz** | 56 pF/m |
| **Maximum unbalance capacitance pair x ground** | 3.3 pF/m |
| **Characteristic impedance** | 100 ± 15 % Ω |
| **Maximum propagation delay** | 545 ns/100 m @ 10 MHz |
| **Maximum delay skew** | 45 ns/100 m |
| **NVP** | 68 % |
| **Insulation resistance** | 10000 MΩ.km |

## Package

| | |
|---|---|
| Wood reel | |
| Standard cable run | 305 m |

## Part Number

| | | | |
|---|---|---|---|
| 23500018 | U/UTP | LSZH | Gray |
| 23500003 | | CM | Gray |

| Freq. (MHz) | Attenuation (dB) | | NEXT (dB) | | PSNEXT (dB) | | ACRF (dB) | | PSACRF (dB) | | RL (dB) | | PSANEXT (dB) | | PSAACRF (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Max. | Typical | Min. | Typical | Min. | Typical | Min. | Typical | Min. | Typical | Min. | Typical | Min. | Typical | Min. | Typical |
| 1 | 2.1 | 1.7 | 74.3 | 102.9 | 72.3 | 89.7 | 67.8 | 95.9 | 64.8 | 85.1 | 20.0 | 34.2 | 67.0 | 89.1 | 67.0 | 86.9 |
| 4 | 3.8 | 3.2 | 65.3 | 90.5 | 63.3 | 80.4 | 55.8 | 69.0 | 52.8 | 73.8 | 23.0 | 34.2 | 67.0 | 89.9 | 66.2 | 79.4 |
| 8 | 5.3 | 4.7 | 60.8 | 86.0 | 58.8 | 77.8 | 49.7 | 60.2 | 46.7 | 67.1 | 24.5 | 33.8 | 67.0 | 87.1 | 60.1 | 72.8 |
| 10 | 5.9 | 5.4 | 59.3 | 81.6 | 57.3 | 73.8 | 47.8 | 57.3 | 44.8 | 65.1 | 25.0 | 32.5 | 67.0 | 86.7 | 58.2 | 70.2 |
| 16 | 7.5 | 6.6 | 56.2 | 79.0 | 54.2 | 71.5 | 43.7 | 51.5 | 40.7 | 61.3 | 25.0 | 38.7 | 67.0 | 84.3 | 54.1 | 66.5 |
| 20 | 8.4 | 7.5 | 54.8 | 75.6 | 52.8 | 68.2 | 41.8 | 48.2 | 38.8 | 59.3 | 25.0 | 35.9 | 67.0 | 81.8 | 52.2 | 64.5 |
| 25 | 9.4 | 8.5 | 53.3 | 80.2 | 51.3 | 69.0 | 39.8 | 44.6 | 36.8 | 56.3 | 24.3 | 35.5 | 67.0 | 79.7 | 50.2 | 62.6 |
| 31.25 | 10.5 | 9.4 | 51.9 | 77.7 | 49.9 | 68.0 | 37.9 | 42.8 | 34.9 | 54.0 | 23.6 | 37.8 | 67.0 | 79.8 | 48.3 | 61.0 |
| 62.5 | 15.0 | 13.6 | 47.4 | 71.4 | 45.4 | 64.8 | 31.9 | 38.9 | 28.8 | 47.0 | 21.5 | 35.2 | 65.6 | 76.2 | 42.3 | 54.5 |
| 100 | 19.1 | 17.3 | 44.3 | 65.8 | 42.3 | 59.8 | 27.8 | 37.8 | 24.8 | 45.6 | 20.1 | 34.3 | 62.5 | 71.2 | 38.2 | 50.0 |
| 200 | 27.6 | 25.1 | 39.8 | 62.6 | 37.8 | 50.6 | 21.8 | 34.3 | 18.8 | 38.3 | 18.0 | 29.9 | 58.0 | 65.7 | 32.2 | 40.9 |
| 250 | 31.1 | 28.4 | 38.3 | 62.8 | 36.3 | 49.1 | 19.8 | 32.7 | 16.8 | 39.9 | 17.3 | 27.8 | 56.5 | 63.6 | 30.2 | 38.3 |
| 300 | 34.3 | 31.3 | 37.1 | 57.5 | 35.1 | 48.2 | 18.3 | 30.5 | 15.3 | 37.3 | 16.8 | 28.7 | 55.3 | 62.4 | 28.7 | 34.8 |
| 400 | 40.1 | 36.6 | 35.3 | 58.0 | 33.3 | 48.5 | 15.8 | 36.0 | 12.8 | 35.6 | 15.9 | 24.7 | 53.5 | 60.8 | 26.2 | 30.6 |
| 500 | 45.3 | 41.4 | 33.8 | 53.0 | 31.8 | 40.8 | 13.8 | 28.5 | 10.8 | 28.3 | 15.2 | 23.6 | 52.0 | 59.5 | 24.2 | 26.6 |

Additional configurations available on request.

# UTP CAT.6A COPPER PATCH CORD GIGALAN AUGMENTED

Accessory for connections in telecommunication rooms and work areas.

## Constructive Characteristics

| | |
|---|---|
| **Length** | From 0.5 to 20 m |
| **Nominal diameter** | 6 mm |
| **Plug type** | RJ-45 CAT.6A |
| **Color** | Gray |
| **Connector type** | RJ-45 |
| **Cable type** | CAT.6.A UTP |
| **Conductor type** | Electrolytic copper, flexible, bare, composed by 7 wires of nominal diameter 0.2 mm |
| **Flammability class** | LSZH |
| **Number of pairs** | 4 pairs, 26 AWG |
| **Electrical contact material** | 8 pins in phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Product body material** | Flame retardant transparent thermoplastic UL 94 V-0 |
| **Assembly type** | T568A, T568B or crossover |

## Performance

| | |
|---|---|
| **Conductor maximum DC electric resistance at 20°C** | 93.8 Ω/km |
| **Maximum mutual capacitance 1kHz** | 56 pF/m |
| **Characteristic impedance** | 100±15 % Ω |
| **Electric voltage between conductors and shielding** | 2500 VDC/3 s |
| **NVP** | 68 % |
| **Maximum propagation delay** | 45 ns/100 m |

## Part Number

| | |
|---|---|
| 35085163 | 1.5 m |
| 35085164 | 2.5 m |
| 35085165 | 5.0 m |

# UTP CAT.6A COPPER EXTENSION GIGALAN AUGMENTED

Accessory for performing connections in telecommunication rooms and for service distribution in horizontal cabling (consolidation point).

## Constructive Characteristics

| | |
|---|---|
| **Length** | From 0.5 to 20 m |
| **Nominal diameter** | 6.3 mm |
| **Color** | Gray or red |
| **Connector type** | RJ-45 (ET) |
| **Conductor type** | Electrolytic copper solid, bare, composed by 7 wires of nominal diameter 0.2 mm |
| **Flammability class** | CM, LSZH |
| **Number of pairs** | 4 pairs, 26 AWG |

## Part Number

| | | | |
|---|---|---|---|
| 35085105 | 2.5 m | Gray | CM |
| 35085106 | 5 m | | |
| 35085107 | 10 m | | |
| 35085143 | 2.5 m | | LSZH |
| 35085130 | 5 m | | |
| 35085144 | 10 m | | |

Additional configurations available on request.

# CAT.6A KEYSTONE JACK GIGALAN AUGMENTED


Accessory for performing connections in telecommunication rooms and work areas.

## Constructive Characteristics

**Width** 17 mm x **Height** 22.4 mm x **Depth** 37.4 mm **Color** Silver

| | |
|---|---|
| **Color** | Blue, beige, white, black and red |
| **Material type** | Transparent thermoplastic flame retardant UL 94 V-0 |
| **Electrical contact material** | Phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Conductor diameter** | 22 to 26 AWG |
| **Assembly type** | T568A and T568B |

## Performance

| | |
|---|---|
| **Retention force between jack and plug** | Minimum 133 N |
| **Number of cycles** | ≥1000 RJ-45 and ≥200 RJ-11 |
| | ≥200 in IDC block |
| **Insulation resistance** | 500 MΩ |
| **Contact resistance** | 20 mΩ |
| **DC resistance** | 0.1 Ω |
| **Dielectric voltage proof** | 1000 V (RMS, 60 Hz, 1 min) |
| **Contact force** | 0.98 N (100 g) |

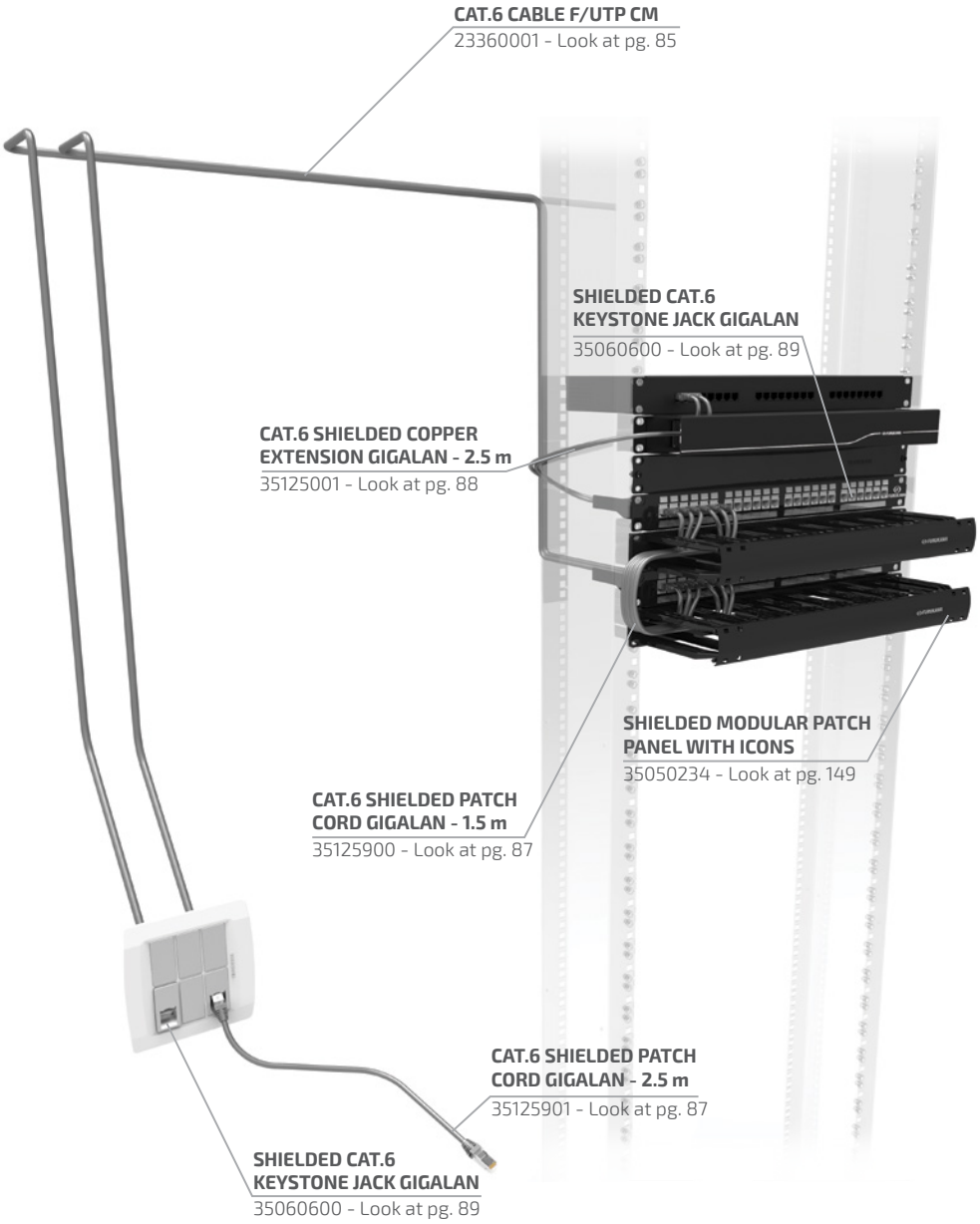
## Part Number

| | |
|---|---|
| 35080011 | White |
| 35080012 | Beige |
| 35080013 | Black |
| 35080015 | Blue |
| 35080018 | Red |

**FTP Channel**
**Industrial FTP Channel**
**UTP Channel**
**Industrial UTP Channel**

# GigaLan

# FTP Channel


CAT.6 CABLE F/UTP CM
23360001 - Look at pg. 85
SHIELDED CAT.6
KEYSTONE JACK GIGALAN
35060600 - Look at pg. 89
CAT.6 SHIELDED COPPER
EXTENSION GIGALAN - 2.5 m
35125001 - Look at pg. 88
SHIELDED MODULAR PATCH
PANEL WITH ICONS
35050234 - Look at pg. 149
CAT.6 SHIELDED PATCH
CORD GIGALAN - 1.5 m
35125900 - Look at pg. 87
CAT.6 SHIELDED PATCH
CORD GIGALAN - 2.5 m
35125901 - Look at pg. 87
SHIELDED CAT.6
KEYSTONE JACK GIGALAN
35060600 - Look at pg. 89

# SHIELDED DATA CABLE GIGALAN CAT.6 F/UTP 23AWG X 4P

Data cable for performing connections between patch panels in technical rooms and connectors at work areas.

## Constructive Characteristics

| | |
|---|---|
| **Shielding** | Metalized polyester tape |
| **Color** | PVC RoHS: Gray or red |
| | LSZH: Green |
| **Nominal diameter** | 7 mm |
| **Weight** | 51 kg/km |
| **Flammability class** | CM - UL 1581 - Vertical tray section 1160 (UL1685) |
| | CMR - UL1666 (Riser) |
| | LSZH-1 - IEC-60332-1 |
| | LSZH - IEC-60332-3 |
| **Number of pairs** | 4 pairs, 23 AWG |
| **Installation temperature** | From 0 °C to 50 °C |
| **Storage temperature** | From -20 °C to 75 °C |
| **Operation temperature** | From -20 °C to 60 °C |

## Performance

See more at performance table for CAT.6 data cables (pg. 103)

## Package

| | |
|---|---|
| Wood reel | |
| Standard cable run | 1000 m |

## Part Number

| | | | |
|---|---|---|---|
| 23360001 | F/UTP | CM | Red |
| 23360000 | | LSZH | Green |

Additional configurations available on request.

# SHIELDED DATA CABLE INDOOR/OUTDOOR GIGALAN CAT.6 F/UTP 23AWG X 4P

Data cable for performing connections between patch panels in technical rooms and connectors at work areas.

## Application

| | |
|---|---|
| **Outdoor installation environment** | Outdoor installation in ducts or aerial lashed |

## Constructive Characteristics

| | |
|---|---|
| **Insulation** | High density polyethylene with nominal diameter of 1 mm |
| **Color** | Black |
| **Cable type** | Double sheath |
| **Nominal diameter** | 9.5 mm |
| **Weight** | 84 kg/km |
| **Flammability class** | CM: UL 1581 - Vertical tray section 1160 (UL 1685) |
| **Waterblocking tape** | Yes |
| **Number of pairs** | 4 pairs, 23 AWG |
| **Installation temperature** | From 0 °C to 50 °C |
| **Storage temperature** | From -20 °C to 75 °C |
| **Operation temperature** | From -20 °C to 60 °C |

## Performance

See more at performance table for CAT.6 data cables (pg. 103)

## Package

| | |
|---|---|
| Wood reel | |
| Standard cable run | 1000 m |

## Part Number

| | | |
|---|---|---|
| 23360006 | F/UTP Indoor/Outdoor | CM, UL “CMX Outdoor” |

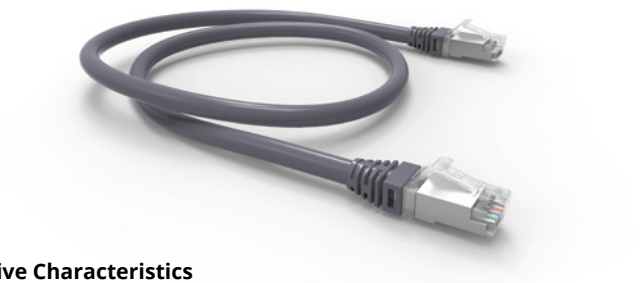
## Observation

Despite outdoor cables are properly designed for installation in outdoor environment, it’s essential to provide electrical protection against lightning, overvoltage and transients compatible with cable category being utilized.

Additional configurations available on request.

# F/UTP CAT.6 SHIELDED COPPER PATCH CORD GIGALAN

Accessory for performing connections in telecommunication rooms (cross-connect) and for service distribution at work area.



## Constructive Characteristics

| | |
|---|---|
| **Length** | From 0.5 to 20 m |
| **Nominal diameter** | 6 mm |
| **Weight** | 0.034 kg/m |
| **Color** | Gray |
| **Connector type** | RJ-45 shielded |
| **Cable type** | CAT.6 F/UTP |
| **Conductor type** | Electrolytic copper, flexible, bare, composed by 7 wires of 0.2 mm diameter |
| **Flammability class** | CM, CMR, LSZH (CM) |
| **Number of pairs** | 4 pairs, 26 AWG |
| **Electrical contact material** | 8 pins in phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Product body material** | Flame retardant transparent thermoplastic UL 94V-0 |
| **Assembly type** | T568A, T568B or crossover |

## Performance

| | |
|---|---|
| **Conductor maximum DC electric resistance at 20°C** | 93.8 Ω/km |
| **Maximum mutual capacitance 1kHz** | 56 pF/m |
| **Characteristic impedance** | 100 ± 15% Ω |
| **Electric voltage between conductors and shielding test** | 2500 VDC/3s |
| **NVP** | 68 % |
| **Delay Skew** | 45 ns/100m |

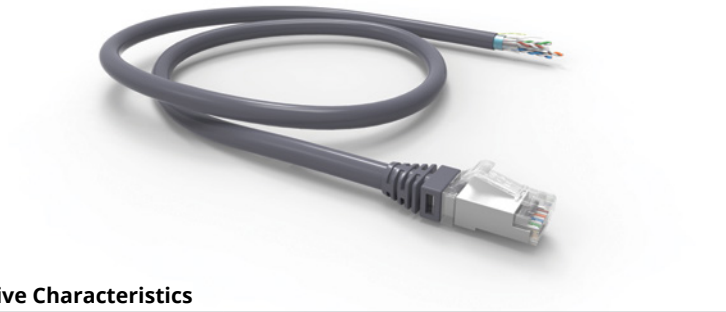
## Part Number

| | | | | |
|---|---|---|---|---|
| 35125900 | 1.5 m | Gray | T568-A/B | CM |
| 35125901 | 2.5 m | | | |
| 35125902 | 3 m | | | |
| 35125903 | 4 m | | | |
| 35125904 | 5 m | | | |

Additional configurations available on request.

# F/UTP CAT.6 SHIELDED COPPER EXTENSION GIGALAN

Accessory for performing connections in telecommunication rooms and for service distribution on horizontal cabling (consolidation point).



## Constructive Characteristics

| | |
|---|---|
| **Length** | From 0.5 to 20 m |
| **Nominal diameter** | 6 mm |
| **Weight** | 0.034 kg/m |
| **Color** | Gray |
| **Connector type** | RJ-45 shielded |
| **Cable type** | CAT.6 F/UTP |
| **Conductor type** | Solid electrolytic copper |
| **Flammability class** | CM |
| **Number of pairs** | 4 pairs, 24 AWG |
| **Electrical contact material** | 8 pins in phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Product body material** | Transparent thermoplastic flame retardant UL 94V-0 |
| **Assembly type** | T568A, T568B or crossover |

## Performance

| | |
|---|---|
| **Conductor maximum DC electric resistance at 20°C** | 93.8 Ω/km |
| **Maximum mutual capacitance 1kHz** | 56 pF/m |
| **Characteristic impedance** | 100 ± 15% Ω |
| **Electric voltage between conductors and shielding test** | 2500 VDC/3s |
| **NVP** | 68 % |
| **Delay skew** | 45 ns/100m |

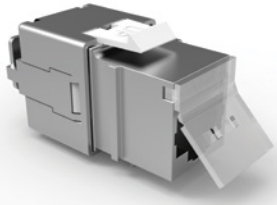
## Part Number

| | | | | |
|---|---|---|---|---|
| 35125001 | 2.5 m | Gray | T568-A/B | CM |
| 35125002 | 5 m | | | |
| 35125003 | 10 m | | | |

Additional configurations available on request.

# SHIELDED CAT.6 KEYSTONE JACK GIGALAN

Accessory for performing connections in telecommunication rooms and work areas.



## Constructive Characteristics

| | |
|---|---|
| **Width** 17 mm x **Height** 22.4 mm x **Depth** 37.4 mm **Color** Silver | |
| **Connector type** | RJ-45 shielded |
| **Electrical contact material** | Phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Conductor diameter** | 22 to 26 AWG |
| **Assembly type** | T568A and T568B |

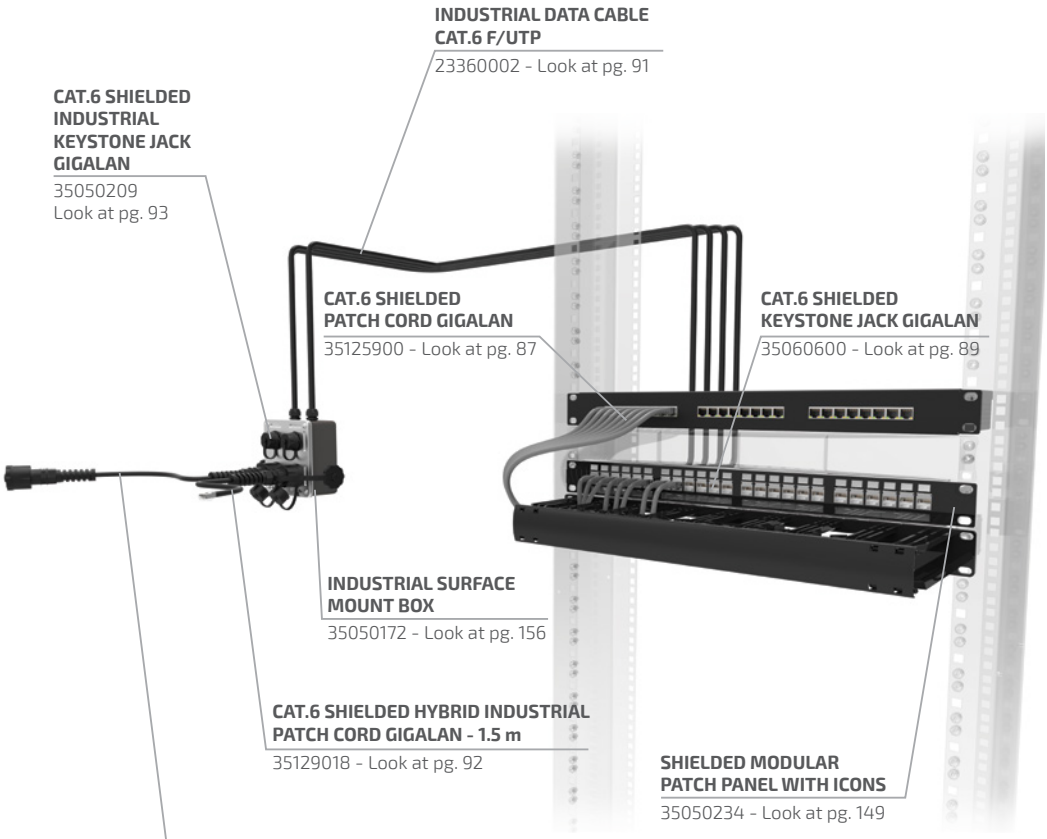
## Performance

| | |
|---|---|
| **Retention force between jack and plug** | Minimum 133 N |
| **Number of cycles** | ≥1000 RJ-45 and ≥200 RJ-11 |
| | ≥200 in IDC block |
| **Insulation resistance** | 500 MΩ |
| **Contact resistance** | 20 mΩ |
| **Maximum DC resistance** | 0.2 Ω |
| **Dielectric voltage proof** | 1000 V (RMS, 60 Hz, 1 min) |
| **Contact force** | 0.98 N (100 g) |

## Part Number

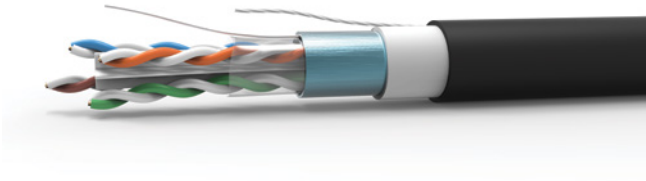
| | |
|---|---|
| 35060600 | Shielded CAT.6 Keystone Jack T568A/B |

# Industrial FTP Channel



# SHIELDED INDUSTRIAL DATA CABLE GIGALAN CAT.6 F/UTP 23AWG X 4P

Data cable for performing connections between patch panels in technical rooms and connectors at work areas.



## Constructive Characteristics

| | |
|---|---|
| **Shielding** | Metalized polyester tape |
| **Color** | Black |
| **Nominal diameter** | 8.6 mm |
| **Weight** | 74 kg/km |
| **Outer sheath material** | TPU – for more mechanical resistance against abrasion |
| | PVC 105° (DC-PVC) - for more chemical and dust resistance |
| **Flammability class** | CMX: IEC 60332-1 standard for cable with outer sheath in TPU |
| | CM: UL 1685 standard for cables with outer sheath in PVC 105° |
| **Number of pairs** | 4 pairs, 23 AWG |
| **Installation temperature** | From 0 °C to 50 °C |
| **Storage temperature** | From -20 °C to 75 °C |
| **Operation temperature** | From -20 °C to 60 °C |

## Performance

See more at performance table for CAT.6 data cables (pg. 103)

## Package

| | |
|---|---|
| Wood reel | |
| Standard cable run | 1000 m |

## Part Number

| | | |
|---|---|---|
| 23360008 | F/UTP Industrial | DC-PVC |
| 23360002 | | TPU |

Additional configurations available on request.

# F/UTP CAT.6 SHIELDED INDUSTRIAL COPPER PATCH CORD GIGALAN

Accessory for services distribution in work areas.

## Constructive Characteristics

| | |
|---|---|
| **Length** | From 1.5 to 5 m |
| **Nominal diameter** | 7.6 mm |
| **Weight** | 0.070 kg/m |
| **Color** | Black |
| **Connector type** | RJ-45 and RJ-45 IP67 |
| **Cable type** | CAT.6 F/UTP |
| **Conductor type** | Electrolytic copper, flexible, bare, composed of 7 wires with 0.16 mm diameter |
| **Outer sheath material** | TPU – for more mechanical resistance against abrasion |
| **Flammability class** | CMX |
| **Number of pairs** | 4 pairs, 26 AWG |
| **Electrical contact material** | 8 pins in phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Product body material** | Transparent thermoplastic flame retardant UL 94V-0 |
| | IP67 boot protector in special thermoplastic material PBT (Polybutylene Terephthalate) |
| **Assembly type** | T568A, T568B or crossover |

## Performance

| | |
|---|---|
| **Conductor maximum DC electric resistance at 20°C** | 140 Ω/km |
| **Maximum mutual capacitance 1kHz** | 56 pF/m |
| **Characteristic impedance** | 100 ± 15% Ω |
| **Electric voltage between conductors and shielding test** | 2500 VDC/3 s |
| **NVP** | 68 % |
| **Delay skew** | 45 ns/100 m |

## Part Number

| | | |
|---|---|---|
| 35129002 | 1.5 m | RJ-45 IP67 / RJ-45 IP67 |
| 35129001 | 2.5 m | |
| 35129003 | 5 m | |
| 35129018 | 1.5 m | RJ-45 / RJ-45 IP67 |
| 35129008 | 2.5 m | |
| 35129004 | 5 m | |

Additional configurations available on request.

# SHIELDED INDUSTRIAL CAT.6 KEYSTONE JACK GIGALAN

Accessory for performing connections in work areas.

## Constructive Characteristics

| | | |
|---|---|---|
| **Connector type** | RJ-45 | |
| **Product body material** | Flame retardant thermoplastic (PBT) UL 94V-0 | |
| | Keystone Jack: polycarbonate | |
| **Electrical contact material** | RJ-45 | Phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| | 110IDC | Phosphor bronze with 100 µin (2.54 µm) of nickel and tin |
| **Conductor diameter** | 22 to 24 AWG | |
| **Assembly type** | T568A and T568B | |
| **Protection index** | IP67 | |

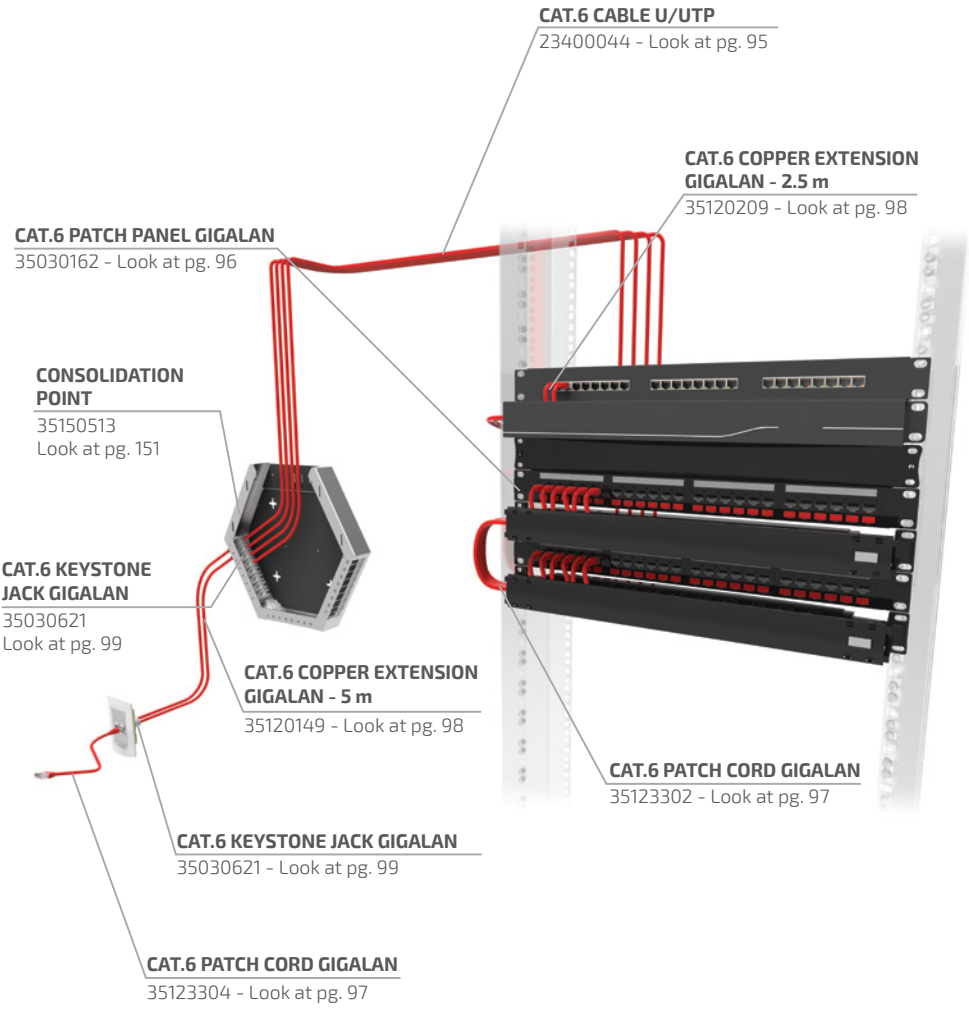
## Performance

| | |
|---|---|
| **Number of cycles** | ≥750 RJ-45 and ≥200 RJ-11 |
| | ≥200 in IDC block |
| **Insulation resistance** | 500 MΩ |
| **Contact resistance** | 20 mΩ |
| **DC resistance** | 0.1 Ω |
| **Dielectric voltage proof** | 1000 V (RMS, 60 Hz, 1 min) |
| **Contact force** | 0.98 N (100 g) |

## Part Number

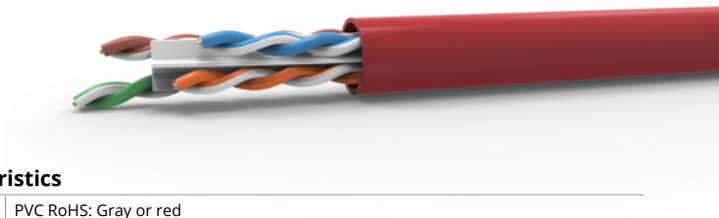
| | |
|---|---|
| 35050209 | Shielded Industrial Cat.6 Keystone Jack |

# UTP Channel


CAT.6 CABLE U/UTP
23400044 - Look at pg. 95
CAT.6 COPPER EXTENSION GIGALAN - 2.5 m
35120209 - Look at pg. 98
CAT.6 PATCH PANEL GIGALAN
35030162 - Look at pg. 96
CONSOLIDATION POINT
35150513
Look at pg. 151
CAT.6 KEYSTONE JACK GIGALAN
35030621
Look at pg. 99
CAT.6 COPPER EXTENSION GIGALAN - 5 m
35120149 - Look at pg. 98
CAT.6 PATCH CORD GIGALAN
35123302 - Look at pg. 97
CAT.6 KEYSTONE JACK GIGALAN
35030621 - Look at pg. 99
CAT.6 PATCH CORD GIGALAN
35123304 - Look at pg. 97

# DATA CABLE GIGALAN CAT.6 U/UTP 23AWG X 4P

Data cable for performing connections between patch panels in technical rooms and connectors at work areas.



## Constructive Characteristics

| | |
|---|---|
| **Color** | PVC RoHS: Gray or red |
| | LSZH: Green |
| **Nominal diameter** | 6 mm |
| **Weight** | 42 kg/km |
| **Flammability class** | CM: UL 1581-Vertical tray section 1160 (UL1685) |
| | CMR: UL 1666 (Riser) |
| | LSZH–1 - IEC-60332-1 |
| | LSZH - IEC-60332-3 |
| **Number of pairs** | 4 pairs, 23 AWG |
| **Installation temperature** | From 0 °C to 50 °C |
| **Storage temperature** | From -20 °C to 75 °C |
| **Operation temperature** | From -20 °C to 60 °C |

## Performance

See more at performance table for CAT.6 data cables (pg. 103)

## Package

| | |
|---|---|
| Fast-box | |
| Standard cable run | 305 m |

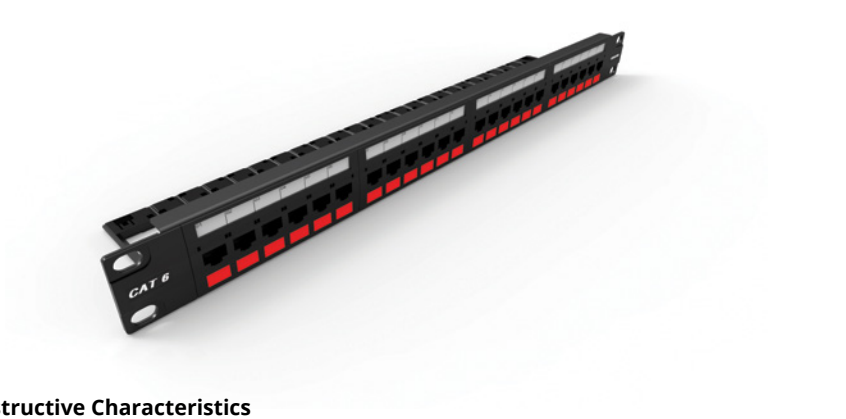
## Part Number

| | | | |
|---|---|---|---|
| 23400021 | U/UTP | CMR | Gray |
| 23400044 | | CM | Red |
| 23400127 | | LSZH | Green |

Additional configurations available on request.

# 24 PORTS CAT.6 PATCH PANEL GIGALAN

Accessory utilized in telecommunication rooms for service distribution in horizontal systems.




## Constructive Characteristics

| | | |
|---|---|---|
| **Width** 482.6 mm (19") x **Height** 43.7 mm (1U) **Color** Black | | |
| **Connector type** | RJ-45 | |
| **Ports amount** | 24 ports | |
| **Product body material** | Steel and high impact thermoplastic UL94V-0 | |
| **Electrical contact material** | RJ-45 | Phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| | 110IDC | Phosphor bronze 100 µin (2.54 µm) of nickel and tin |
| **Conductor diameter** | 22 to 26 AWG | |

## Performance

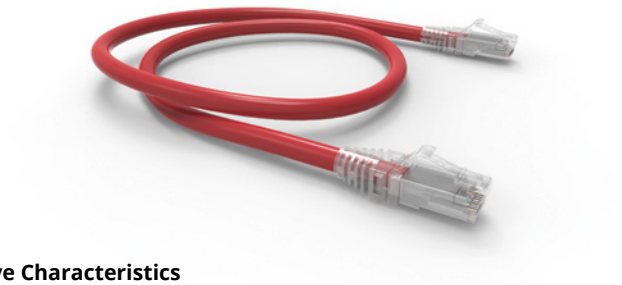
| | |
|---|---|
| **Retention force between jack and plug** | Minimum 133 N |
| **Number of cycles** | ≥ 750 RJ-45 and ≥ 200 RJ-11 |
| | ≥ 200 in IDC block |
| **Isolation resistance** | 500 MΩ |
| **Contact resistance** | 20 mΩ |
| **DC resistance** | 0.1 Ω |
| **Applied electrical voltage test** | 1000 V (RMS, 60 Hz, 1min) |
| **Contact force** | 800 g |

## Part Number

| | |
|---|---|
| 35030162 | 24 Ports CAT. 6 Patch Panel GigaLan |

# U/UTP CAT.6 COPPER PATCH CORD GIGALAN

Accessory for performing connections in telecommunication rooms (cross-connect) and for service distribution at work area.



## Constructive Characteristics

| | |
|---|---|
| **Length** | From 0.5 to 20 m |
| **Nominal diameter** | 6 mm |
| **Weight** | 0.034 kg/m |
| **Color** | Yellow, blue, white, red, gray, green and black |
| **Connector type** | RJ-45 |
| **Cable type** | CAT.6 U/UTP |
| **Conductor type** | Electrolytic copper, flexible, bare, comprised by 7 wires of 0.2 mm diameter |
| **Flammability class** | CM (standard), CMR and LSZH |
| **Number of pairs** | 4 pairs, 24 AWG |
| **Electrical contact material** | 8 pins in phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Product body material** | Transparent thermoplastic flame retardant UL 94V-0 |
| **Assembly type** | T568A, T568B or crossover |

## Performance

| | |
|---|---|
| **Conductor maximum DC electric resistance at 20°C** | 93.8 Ω/km |
| **Maximum mutual capacitance 1kHz** | 56 pF/m |
| **Characteristic impedance** | 100 ± 15% Ω |
| **Electric voltage between conductors and shielding test** | 2500 VDC/3 s |

## Part Number

| | | | |
|---|---|---|---|
| 35123302 | 1.5 m | Red | CM |
| 35123303 | 2 m | | |
| 35123304 | 2.5 m | | |
| 35123305 | 3 m | | |
| 35123306 | 4 m | | |
| 35123307 | 5 m | | |
| 35124402 | 1.5 m | Green | LSZH |
| 35124404 | 2.5 m | | |
| 35124407 | 5 m | | |

Additional configurations available on request.

# U/UTP CAT.6 COPPER EXTENSION GIGALAN

Accessory for performing connections in telecommunication rooms and for service distribution on horizontal cabling (consolidation point).

## Constructive Characteristics

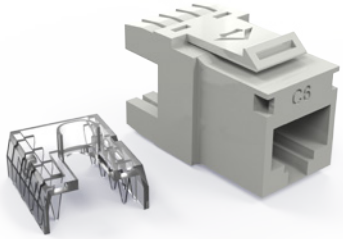
| | |
|---|---|
| **Length** | From 0.5 to 20 m |
| **Nominal diameter** | 6 mm |
| **Color** | Red and gray |
| **Connector type** | RJ-45 |
| **Cable type** | CAT. 6 U/UTP |
| **Conductor type** | Solid electrolytic copper |
| **Flammability class** | CM (standard) |
| **Number of pairs** | 4 pairs, 23 AWG |

## Part Number

| | | |
|---|---|---|
| 35120209 | 2.5 m | Red |
| 35120149 | 5 m | |
| 35120381 | 10 m | |

# CAT.6 KEYSTONE JACK GIGALAN 90º/180º

Accessory for performing connections in telecommunication rooms and work areas.




## Constructive Characteristics

| | |
|---|---|
| **Color** | Blue, white, beige, black and red |
| **Connector type** | RJ-45 |
| **Product body material** | Flame retardant thermoplastic UL 94V-0 |
| **Electrical contact material** | Phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Conductor diameter** | 22 to 26 AWG |
| **Assembly type** | T568A and T568B |
| **Cable Angle** | 90º or 180º |

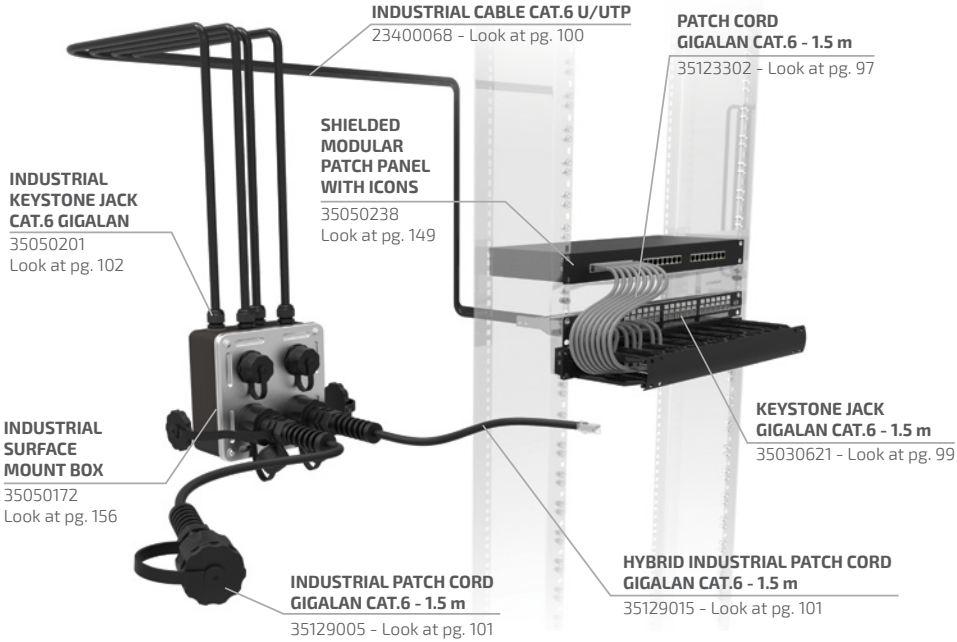
## Performance

| | |
|---|---|
| **Retention force between jack and plug** | Minimum 133N |
| **Number of cycles** | ≥750 RJ45 and ≥200 RJ11 |
| | ≥200 in IDC block |
| **Insulation resistance** | 500 MΩ |
| **Contact resistance** | 20 mΩ |
| **DC resistance** | 0.1 Ω |
| **Dielectric voltage proof** | 1000 V (RMS, 60 Hz, 1 min) |
| **Contact force** | 0.98 N (100 g) |

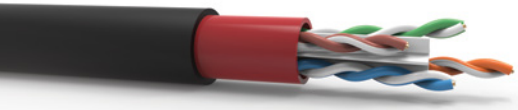
## Part Number

| | |
|---|---|
| 35030621 | Keystone Jack Gigalan CAT. 6 T568A/B 90/180 - White |
| 35030622 | Keystone Jack Gigalan CAT. 6 T568A/B 90/180 - Beige |
| 35030623 | Keystone Jack Gigalan CAT. 6 T568A/B 90/180 - Black |
| 35030625 | Keystone Jack Gigalan CAT. 6 T568A/B 90/180 - Blue |
| 35030628 | Keystone Jack Gigalan CAT. 6 T568A/B 90/180 - Red |

# Industrial UTP Channel




## INDUSTRIAL DATA CABLE GIGALAN CAT.6 U/UTP 23AWG X 4P



Data cable for performing connections between patch panels in technical rooms and connectors at work areas.

### Constructive Characteristics

| | | | |
|---|---|---|---|
| **Shielding** | Unshielded (U/UTP) | **Flammability class** | CMX: UL2556 VW-1 standard for cables with outer sheath in TPU |
| **Color** | Black | | CM: UL 1685 standard for cables with outer sheath in PVC 105° |
| **Nominal diameter** | 7.4 mm | **Number of pairs** | 4 pairs, 23AWG |
| **Weight** | 62 kg/km | **Installation temperature** | From 0 °C to 50 °C |
| **Outer sheath material** | TPU – for more mechanical resistance against abrasion | **Storage temperature** | From -20 °C to 75 °C |
| | PVC 105° (DC-PVC) - for more chemical and dust resistance | **Operation temperature** | From -20 °C to 60 °C |

### Performance

See more at performance table for CAT.6 data cables (pg. 103)

### Package

| | |
|---|---|
| Wood reel | |
| Standard cable run | 1000 m |

### Part Number

| | | |
|---|---|---|
| 23400085 | U/UTP Industrial | DC-PVC |
| 23400068 | | TPU |

Additional configurations available on request.

# U/UTP CAT.6 INDUSTRIAL PATCH CORD GIGALAN

Accessory for services distribution in work areas.

## Constructive Characteristics

| | |
|---|---|
| **Length** | From 1.5 to 5 m |
| **Nominal diameter** | 7.6 mm |
| **Weight** | 0.070 kg/m |
| **Color** | Black |
| **Connector type** | RJ-45 and RJ-45 IP67 |
| **Cable type** | CAT.6 U/UTP |
| **Conductor type** | Electrolytic copper, flexible, bare, composed by 7 wires with 0.2 mm diameter |
| **Outer sheath material** | TPU – for more mechanical resistance against abrasion |
| **Flammability class** | CMX |
| **Number of pairs** | 4 pairs, 26 AWG |
| **Electrical contact material** | 8 pins in phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Product body material** | Transparent thermoplastic flame retardant UL 94V-0 |
| | IP67 boot protector in special thermoplastic material PBT (Polybutylene Terephthalate) |
| **Assembly type** | T568A, T568B or crossover |

## Performance

| | |
|---|---|
| **Conductor maximum DC electric resistance at 20°C** | 93.8 Ω/km |
| **Maximum mutual capacitance 1kHz** | 56 pF/m |
| **Characteristic impedance** | 100 ± 15% Ω |
| **Electric voltage between conductors and shielding test** | 2500 VDC/3 s |
| **NVP** | 68 % |
| **Delay skew** | 45 ns/100 m |

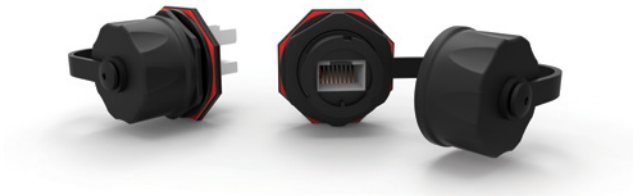
## Part Number

| | | | |
|---|---|---|---|
| 35129005 | 1.5 m | RJ-45 IP67 / RJ-45 IP67 | T568-A/B |
| 35129010 | 2.5 m | | |
| 35129012 | 5 m | | |
| 35129015 | 1.5 m | RJ-45 / RJ-45 IP67 | |
| 35129006 | 2.5 m | | |
| 35129009 | 5 m | | |

Additional configurations available on request.

# INDUSTRIAL CAT.6 KEYSTONE JACK GIGALAN

Accessory for performing connections in telecommunication rooms and work areas.



## Constructive Characteristics

| | | |
|---|---|---|
| **Connector type** | RJ-45 | |
| **Product body material** | Flame retardant thermoplastic (PBT) UL 94V-0 | |
| | Keystone jack: polycarbonate | |
| **Electrical contact material** | RJ-45 | Phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| | 110IDC | Phosphor bronze with 100 µin (2.54 µm) of nickel and tin |
| **Conductor diameter** | 22 to 24 AWG | |
| **Assembly type** | T568A and T568B | |
| **Protection index** | IP67 | |

## Performance

| | |
|---|---|
| **Number of cycles** | ≥750 RJ-45 and ≥200 RJ-11 |
| | ≥200 in IDC block |
| **Insulation resistance** | 500 MΩ |
| **Contact resistance** | 20 mΩ |
| **DC resistance** | 0.1 Ω |
| **Dielectric voltage proof** | 1000 V (RMS, 60 Hz, 1 min) |
| **Contact force** | 0.98 N (100 g) |

## Part Number

| | |
|---|---|
| 35050201 | Industrial Cat.6 Keystone Jack |

# PERFORMANCE TABLE FOR CAT.6 DATA CABLES

## Performance

| | | |
|---|---|---|
| **Maximum unbalance resistance** | 5 % | |
| **Conductor maximum DC electric resistance at 20°C** | 93.8 Ω/km | |
| **Maximum mutual capacitance 1kHz** | 56 pF/m | |
| **Maximum unbalance capacitance pair x ground** | 3.3 pF/m | |
| **Characteristic impedance** | 100±15% Ω | |
| **Maximum propagation delay** | 545 ns/100 m @ 10 MHz | |
| **Maximum delay skew** | 45 ns/100 m | |
| **NVP** | 68 % | |
| **Insulation resistance** | 10000 M Ω.km | |
| **Type** | **F/UTP** | **U/UTP** |
| **Electric voltage between conductors test** | 1000 VDC/3s | 2500 VDC/3 s |
| **Electric voltage between conductors and shielding test** | 500 VDC/3s | - |

| **Freq. (MHz)** | **Attenuation dB** | **NEXT dB** | **PSNEXT dB** | **ACRF dB** | **PSACRF dB** | **RL dB** |
|---|---|---|---|---|---|---|
| | **TIA Max.** | **TIA Min.** | **TIA Min.** | **TIA Min.** | **TIA Min.** | **TIA Min.** |
| 1 | 2.0 | 74.3 | 72.3 | 67.8 | 64.8 | 20.0 |
| 4 | 3.8 | 65.3 | 63.3 | 55.8 | 52.8 | 23.0 |
| 8 | 5.3 | 60.8 | 58.8 | 49.7 | 46.7 | 24.5 |
| 10 | 6.0 | 59.3 | 57.3 | 47.8 | 44.8 | 25.0 |
| 16 | 7.6 | 56.2 | 54.2 | 43.7 | 40.7 | 25.0 |
| 20 | 8.5 | 54.8 | 52.8 | 41.8 | 38.8 | 25.0 |
| 25 | 9.5 | 53.3 | 51.3 | 39.8 | 36.8 | 24.3 |
| 31.25 | 10.7 | 51.9 | 49.9 | 37.9 | 34.9 | 23.6 |
| 62.5 | 15.4 | 47.4 | 45.4 | 31.9 | 25.9 | 21.5 |
| 100 | 19.8 | 44.3 | 42.3 | 27.8 | 24.8 | 20.1 |
| 200 | 29.0 | 39.8 | 37.8 | 21.8 | 18.8 | 18.0 |
| 250 | 32.8 | 38.3 | 36.3 | 19.8 | 16.8 | 17.3 |

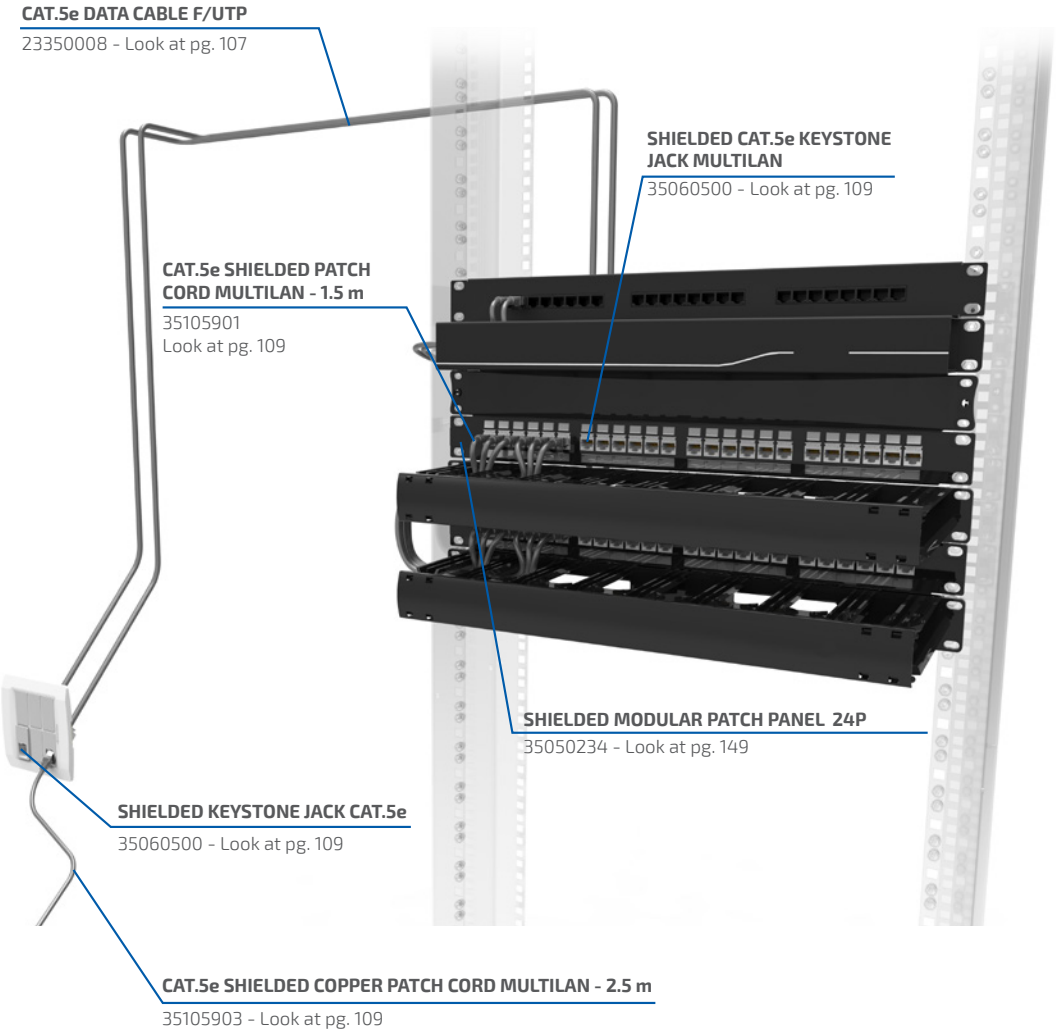
Note:
Temperature 20°C +/- 3°C
Considered length 100 meters.

Higher frequencies than specified on TIA and ISO standards are for information only.

**FTP Channel**
**UTP Channel**
**Industrial FTP Channel**
**Industrial UTP Channel**

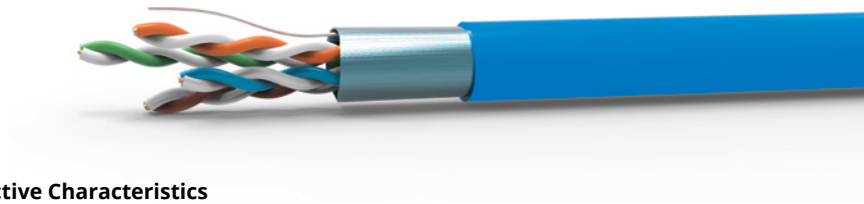
# MultiLan

# FTP Channel


CAT.5e DATA CABLE F/UTP
23350008 - Look at pg. 107
SHIELDED CAT.5e KEYSTONE JACK MULTILAN
35060500 - Look at pg. 109
CAT.5e SHIELDED PATCH CORD MULTILAN - 1.5 m
35105901
Look at pg. 109
SHIELDED MODULAR PATCH PANEL 24P
35050234 - Look at pg. 149
SHIELDED KEYSTONE JACK CAT.5e
35060500 - Look at pg. 109
CAT.5e SHIELDED COPPER PATCH CORD MULTILAN - 2.5 m
35105903 - Look at pg. 109

# DATA CABLE MULTILAN SHIELDED CAT.5e F/UTP 24AWG X 4P

Data cable for performing connections between patch panels in technical rooms and connectors at work areas.



## Constructive Characteristics

| | |
|---|---|
| **Shielding** | Metalized polyester tape |
| **Color** | PVC ROHS: Gray or blue |
| | LSZH: Blue |
| **Nominal diameter** | 6.2 mm |
| **Weight** | 40 kg/km |
| **Flammability class** | CM: UL 1581 - Vertical tray section 1160 (UL 1685) |
| | CMR: standard UL 1666 (Riser) |
| | LSZH-1 - IEC-60332-1 |
| | LSZH - IEC-60332-3 |
| **Number of pairs** | 4 pairs, 24 AWG |
| **Installation temperature** | From 0 °C to 50 °C |
| **Storage temperature** | From -20 °C to 75 °C |
| **Operation temperature** | From -20 °C to 60 °C |

## Performance

See more at performance table for CAT.5e data cables (pg. 123).

## Package

| | |
|---|---|
| Wood reel | |
| Standard cable run | 1500 m |

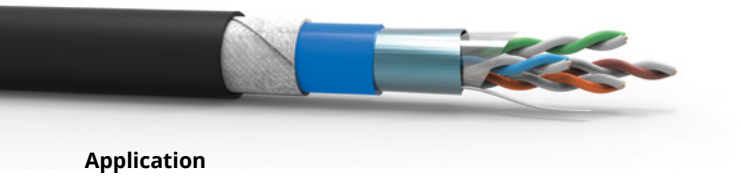
## Part Number

| | | | |
|---|---|---|---|
| 23350008 | F/UTP | CM | Blue |

Additional configurations available on request.

# DATA CABLE MULTILAN SHIELDED INDOOR/OUTDOOR CAT.5e F/UTP 24AWG X 4P

Data cable for performing connections between patch panels in technical rooms and connectors at work areas.



## Application

| | |
|---|---|
| **Outdoor installation environment** | Lashed aerial (UV resistant) |
| | In ducts (for model with waterblocking tape) |

## Constructive Characteristics

| | |
|---|---|
| **Insulation** | High density polyethylene |
| **Color** | Black |
| **Number of pairs** | 4 pairs, 24 AWG |
| **Installation temperature** | From 0 °C to 50 °C |
| **Storage temperature** | From -20 °C to 75 °C |
| **Operation temperature** | From -20 °C to 60 °C |

| Jacket type | Nominal diameter (mm) | Weight (kg/km) | Flammability class | Waterblocking tape |
|---|---|---|---|---|
| Single | 6.2 | 52 | CMX | No |
| Double | 8.6 | 84.0 | CM | Yes |

## Performance

See more at performance table for CAT.5e data cables (pg. 123).

## Package

| | |
|---|---|
| Wood reel | |
| Standard cable run | 1500 m |

## Part Number

| | | |
|---|---|---|
| 23350010 | F/UTP Indoor / Outdoor | CM, UL “CMX Outdoor” |

## Observation

Despite outdoor cables are properly designed for installation in outdoor environment, it’s essential to provide electrical protection against lightning, overvoltage and transients compatible with cable category being utilized.

# F/UTP CAT.5e SHIELDED COPPER PATCH CORD MULTILAN

Accessory for performing connections in telecommunication rooms (cross-connect) and for service distribution at work area.

## Constructive Characteristics

| | |
|---|---|
| **Length** | From 0.5 to 20 m |
| **Nominal diameter** | 5.3 mm |
| **Weight** | 0.035 kg/m |
| **Color** | Gray |
| **Connector type** | RJ-45 shielded |
| **Cable type** | F/UTP |
| **Conductor type** | Electrolytic copper, flexible, bare, composed by 7 wires of 0.16 mm diameter |
| **Flammability class** | CM, CMR, LSZH |
| **Number of pairs** | 4 pairs, 26 AWG |
| **Electrical contact material** | 8 pins in phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Product body material** | Transparent thermoplastic flame retardant UL 94V-0 |
| **Wiring** | T568A, T568-B or crossover |

## Performance

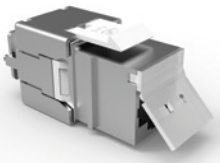
See more at performance table for CAT.5e data cables (pg. 123).

## Part Number

| | | | | |
|---|---|---|---|---|
| 35105901 | F/UTP | 1.5 m | Gray | CM |
| 35105903 | | 2.5 m | | |
| 35105910 | | 3 m | | |
| 35105904 | | 5 m | | |
| 35105909 | | 15 m | | |

Additional configurations available on request.

# SHIELDED CAT.5e KEYSTONE JACK MULTILAN



Accessory for performing connections in telecommunication rooms and work areas.

## Constructive Characteristics

| | |
|---|---|
| **Color** | Silver |
| **Connector type** | RJ-45 shielded |
| **Electrical contact material** | Phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Conductor diameter** | 22 to 26 AWG |
| **Assembly type** | T568A and T568 |

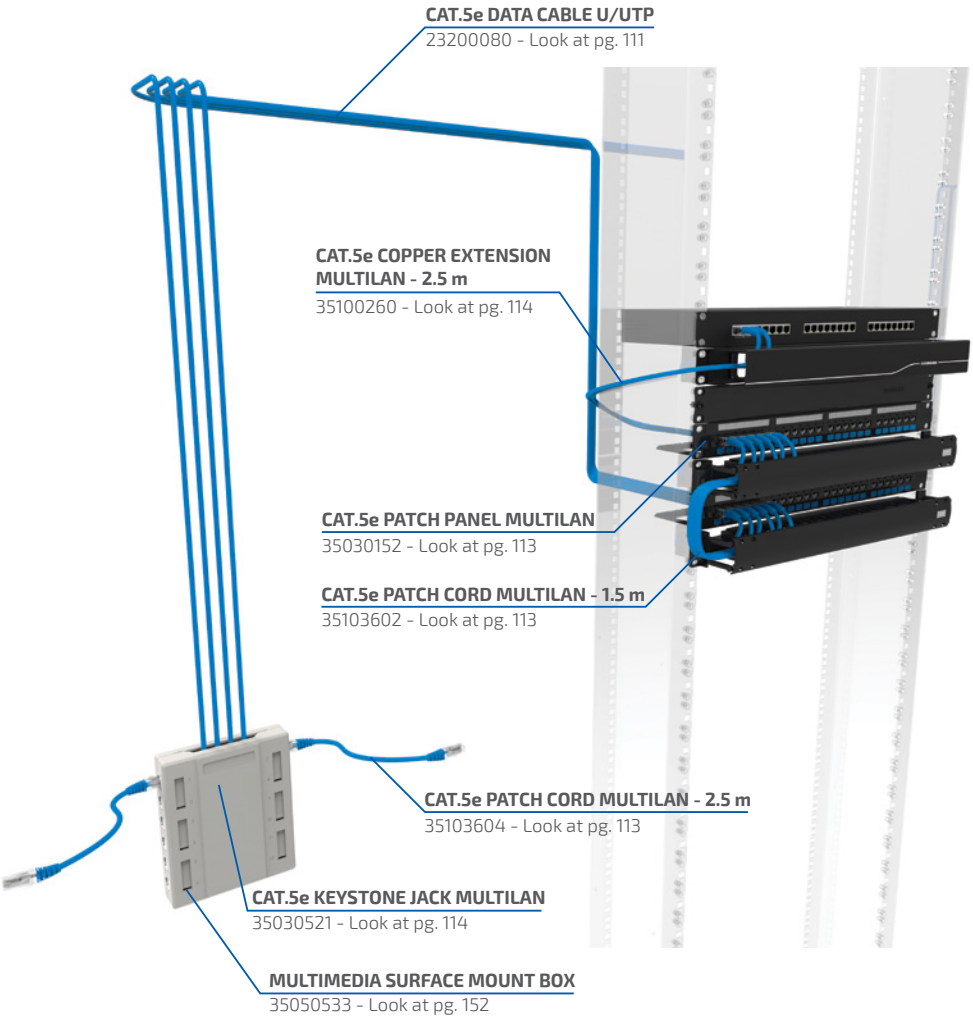
## Performance

| | |
|---|---|
| **Retention force between jack and plug** | Minimum 133 N |
| **Number of cycles** | ≥1000 RJ-45 and ≥200 RJ-11 |
| | ≥200 in IDC block |
| **Insulation resistance** | 500 MΩ |
| **Contact resistance** | 20 mΩ |
| **Maximum DC resistance** | 0.2 Ω |
| **Dielectric voltage proof** | 1000 V (RMS, 60 Hz, 1 min) |
| **Contact force** | 0.98 N (100 g) |

## Part Number

| | |
|---|---|
| 35060500 | Shielded CAT.5e Keystone Jack T568A/B MultiLan |

# UTP Channel


CAT.5e DATA CABLE U/UTP
23200080 - Look at pg. 111
CAT.5e COPPER EXTENSION MULTILAN - 2.5 m
35100260 - Look at pg. 114
CAT.5e PATCH PANEL MULTILAN
35030152 - Look at pg. 113
CAT.5e PATCH CORD MULTILAN - 1.5 m
35103602 - Look at pg. 113
CAT.5e PATCH CORD MULTILAN - 2.5 m
35103604 - Look at pg. 113
CAT.5e KEYSTONE JACK MULTILAN
35030521 - Look at pg. 114
MULTIMEDIA SURFACE MOUNT BOX
35050533 - Look at pg. 152

# DATA CABLE MULTILAN CAT.5e U/UTP 24AWG X 4P

Data cable for performing connections between patch panels in technical rooms and connectors at work areas.

## Constructive Characteristics

| | |
|---|---|
| **Color** | PVC RoHS: Blue or gray |
| | LSZH: Green or blue |
| **Nominal diameter** | 4.8 mm |
| **Weight** | 26 kg/km |
| **Flammability class** | CM - UL 1581 - Vertical tray section 1160 (UL 1685) |
| | CMR: UL 1666 standard (Riser) |
| | LSZH-1 - IEC-60332-1 |
| | LSZH - IEC-60332-3 |
| **Number of pairs** | 4 pairs, 24 AWG |
| **Installation temperature** | From 0 °C to 50 °C |
| **Storage temperature** | From -20 °C to 75 °C |
| **Operation temperature** | From -20 °C to 60 °C |

## Performance

See more at performance table for CAT.5e data cables (pg. 123).

## Package

| | |
|---|---|
| Fast-Box | |
| Standard cable run | 305 m |

## Part Number

| | | | |
|---|---|---|---|
| 23200061 | U/UTP | CM | Gray |
| 23200080 | | | Blue |
| 23200005 | | CMR | Blue |
| 23200138 | | LSZH | Green |

Additional configurations available on request.

# DATA CABLE MULTILAN CAT.5e U/UTP 24AWG X 25P

Data cable for performing connections between patch panels in technical rooms and connectors at work areas.

## Constructive Characteristics

| | |
|---|---|
| **Color** | Blue |
| **Flammability class** | CM: standard UL 1581 - Vertical tray section 1160 |
| **Nominal diameter** | 13.5 mm |
| **Weight** | 200 kg/km |
| **Internal sheath over 4P sub-unities** | Yes |
| **Number of pairs** | 25 pairs, 24 AWG |
| **Installation temperature** | From 0 °C to 50 °C |
| **Storage temperature** | From -20 °C to 75 °C |
| **Operation temperature** | From -20 °C to 60 °C |

## Performance

See more at performance table for CAT.5e data cables (pg. 123).

## Package

| | |
|---|---|
| Wood reel | |
| Standard cable run | 500 m |

## Part Number

| | | | |
|---|---|---|---|
| 23200012 | U/UTP | CM | Blue |

Additional configurations available on request.

# DATA CABLE MULTILAN CMX OUTDOOR CAT.5e U/UTP 24AWG X 4P

Despite outdoor cables are properly designed for installation in outdoor environment, it's essential to provide electrical protection against lightning, overvoltage and transients compatible with cable category being utilized.

## Application

| | |
|---|---|
| **Outdoor installation environment** | Lashed aerial in outdoor installations. |

## Constructive Characteristics

| | |
|---|---|
| **Insulation** | High density polyethylene |
| **Jacket** | PVC CMX Outdoor (UL 444) |
| **Color** | Black |
| **Nominal diameter** | 5.5 mm |
| **Weight** | 35 kg/km |
| **Flammability class** | CMX (UL 1581 VW-1) |
| **Waterblocking tape** | No |
| **Number of pairs** | 4 pairs, 24 AWG |
| **Installation temperature** | From 0 °C to 50 °C |
| **Storage temperature** | From -20 °C to 75 °C |
| **Operation temperature** | From -20 °C to 60 °C |

## Performance

See more at performance table for CAT.5e data cables (pg. 123).

## Package

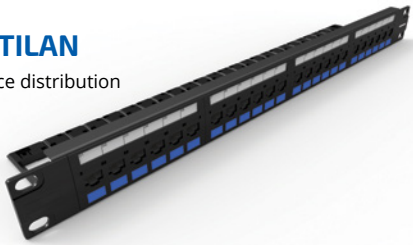
| Type | Wood reel | Fast-box |
|---|---|---|
| Standard cable run | 1600 m | 305 m |

## Part Number

| | |
|---|---|
| 23200086 | UL "CMX Outdoor" |

Additional configurations available on request.

# 24 PORTS CAT.5e PATCH PANEL MULTILAN



Accessory utilized in telecommunication rooms for service distribution in horizontal systems.

## Constructive Characteristics

| | | |
|---|---|---|
| **Width** 482.6 mm (19") x **Height** 43.7 mm 24P<br>**Color** Black | | |
| **Connector type** | RJ-45 | |
| **Number of ports** | 24 ports | |
| **Product body material** | Steel and high impact thermoplastic UL94V-0 | |
| **Electrical contact material** | RJ-45 | Phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| | 110 IDC | Phosphor bronze with 100 µin (2.54 µm) of nickel and tin |
| **Conductor diameter** | 22 to 26 AWG | |

## Performance

| | |
|---|---|
| **Retention force between jack and plug** | Minimum 133 N |
| **Number of cycles** | ≥ 750 RJ-45 and ≥ 200 RJ-11 |
| | ≥ 200 in IDC block |
| **Insulation resistance** | 500 MΩ |
| **Contact resistance** | 20 mΩ |
| **DC resistance** | 0.1 Ω |
| **Dielectric voltage proof** | 1000 V (RMS, 60 Hz, 1 min) |
| **Contact force** | 0.98 N (100 g) |

## Part Number

| | |
|---|---|
| 35030152 | 24 Port CAT.5e MultiLan Patch Panel |

# U/UTP CAT.5e COPPER PATCH CORD MULTILAN

Accessory for performing connections in telecommunication rooms (cross-connect) and for service distribution at work area.

## Constructive Characteristics

| | |
|---|---|
| **Length** | From 0.5 to 20 m |
| **Nominal diameter** | 5.2 mm |
| **Weight** | 0.031 kg/m |
| **Color** | Yellow, blue, white, red, gray, green and black |
| **Connector type** | RJ-45 |
| **Cable type** | U/UTP |
| **Conductor type** | Electrolytic copper, flexible, bare, composed by 7 wires of 0.2 mm diameter |
| **Flammability class** | CM (standard), CMR, LSZH |
| **Number of pairs** | 4 pairs, 24 AWG |
| **Electrical contact material** | 8 pins in phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Product body material** | Flame retardant transparent thermoplastic UL 94V-0 |
| **Assembly type** | T568A, T568B or crossover |

## Performance

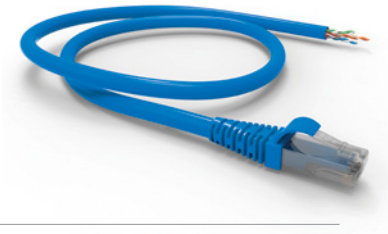
See more at performance table for CAT.5e data cables (pg. 123).

## Part Number

| | | | |
|---|---|---|---|
| 35103602 | 1.5 m | Blue | CM |
| 35103604 | 2.5 m | | |
| 35103605 | 3 m | | |
| 35103607 | 5 m | | |
| 35103612 | 10 m | | |
| 35103614 | 15 m | | |

Additional configurations available on request.

# U/UTP CAT.5e COPPER EXTENSION MULTILAN



Accessory for performing connections in telecommunication rooms and for service distribution on horizontal cabling (consolidation point).

## Constructive Characteristics

| | |
|---|---|
| **Length** | From 0.5 m to 20 m |
| **Nominal diameter** | 5.2 mm |
| **Color** | Standard: Blue and gray |
| **Connector type** | RJ-45 |
| **Cable type** | U/UTP |
| **Conductor type** | Solid electrolytic copper |
| **Flammability class** | CM |
| **Number of pairs** | 4 pairs, 24 AWG |

## Part Number

| | | |
|---|---|---|
| 35100260 | 2.5 m | Blue |
| 35100105 | 5 m | |
| 35100013 | 10 m | |

Additional configurations available on request.

# CAT.5e KEYSTONE JACK MULTILAN


Accessory for performing connections in telecommunication rooms and work areas.

## Constructive Characteristics

| | |
|---|---|
| **Connector type** | RJ-45 |
| **Material type** | Flame retardant thermoplastic UL 94V-0 |
| **Color** | Black, blue, red, white, beige |
| **Electrical contact material** | Phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Conductor diameter** | 22 to 26 AWG |
| **Assembly type** | T568A and T568B |
| **Cable angle** | 90° or 180° |

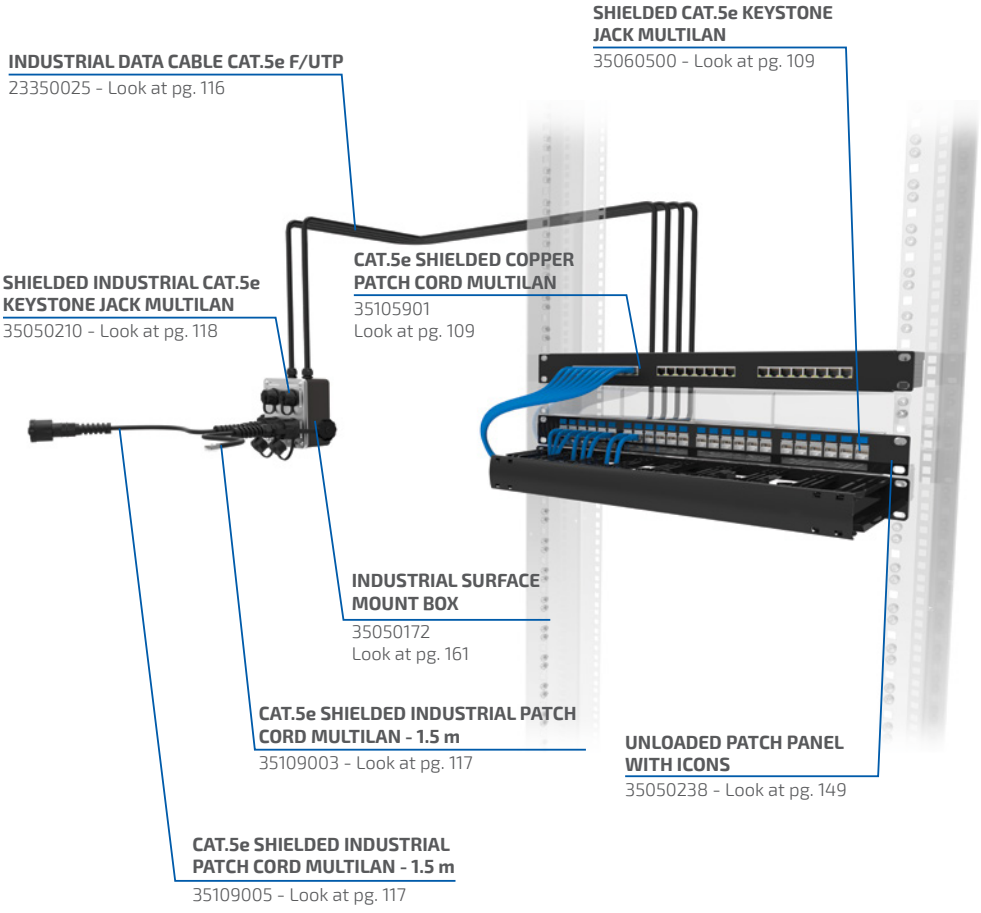
## Performance

| | |
|---|---|
| **Retention force between jack and plug** | Minimum 133 N |
| **Number of cycles** | ≥1000 RJ-45 and ≥200 RJ-11 |
| | ≥200 in IDC block |
| **Insulation resistance** | 500 MΩ |
| **Contact resistance** | 20 mΩ |
| **Maximum DC resistance** | 0.1 Ω |
| **Dielectric voltage proof** | 1000 V (RMS, 60 Hz, 1 min) |
| **Contact force** | 0.98 N (100 g) |

## Part Number

| | |
|---|---|
| 35030521 | White |
| 35030522 | Beige |
| 35030523 | Black |
| 35030525 | Blue |
| 35030528 | Red |

# Industrial FTP Channel



# INDUSTRIAL DATA CABLE SHIELDED MULTILAN CAT.5e F/UTP 24AWG X 4P

Data cable for performing connections between patch panels in technical rooms and connectors at work areas.

## Constructive Characteristics

| | |
|---|---|
| **Shielding** | Metalized polyester tape |
| **Color** | Black |
| **Nominal diameter** | 7.7 mm |
| **Weight** | 59 kg/km |
| **Outer sheath material** | TPU – for superior mechanical resistance against abrasion |
| | PVC 105º (DC-PVC) - for more chemical and dust resistance |
| **Flammability class** | CMX: UL 2556 VW-1 flame test standard for cable with outer sheath in TPU |
| | CM: UL 1685 standard for cable with outer sheath in PVC |
| **Number of pairs** | 4 pairs, 24 AWG |
| **Installation temperature** | From 0 °C to 50 °C |
| **Storage temperature** | From -20 °C to 75 °C |
| **Operation temperature** | From -20 °C to 60 °C |

## Performance

See more at performance table for CAT.5e data cables (pg. 123).

## Package

| | |
|---|---|
| Wood reel | |
| Standard cable run | 1000 m |

## Part Number

| | | |
|---|---|---|
| 23350029 | F/UTP Industrial | DC-PVC |
| 23350025 | | TPU |

Additional configurations available on request.

# F/UTP CAT.5e SHIELDED INDUSTRIAL COPPER PATCH CORD MULTILAN

Accessory for services distribution in work areas.

## Constructive Characteristics

| | |
|---|---|
| **Length** | From 1.5 to 5 m |
| **Nominal diameter** | 7.6 mm |
| **Weight** | 0.070 kg/m |
| **Color** | Black |
| **Connector type** | RJ-45 and RJ-45 IP67 shielded |
| **Cable type** | F/UTP |
| **Conductor type** | Electrolytic copper, flexible, bare, composed by 7 wires of 0.16 mm diameter |
| **Outer sheath material** | TPU – for superior mechanical resistance against abrasion |
| **Flammability class** | CMX |
| **Number of pairs** | 4 pairs, 26 AWG |
| **Electrical contact material** | 8 pins in phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Product body material** | Connector in flame retardant thermoplastic UL 94V-0 |
| | IP67 boot protector in special thermoplastic material PBT (Polybutylene Terephthalate) |
| **Wiring** | T568A/B |

## Performance

See more at performance table for CAT.5e data cables (pg. 123).

## Part Number

| | | |
|---|---|---|
| 35109005 | 1.5 m | RJ-45 IP67 / RJ-45 IP67 |
| 35109000 | 2.5 m | |
| 35109008 | 5 m | |
| 35109003 | 1.5 m | RJ-45 / RJ-45 IP67 |
| 35109001 | 2.5 m | |
| 35109009 | 5 m | |

Additional configurations available on request.

# SHIELDED INDUSTRIAL CAT.5e KEYSTONE JACK MULTILAN

Accessory for performing connections in work areas.

## Constructive Characteristics

| | |
|---|---|
| **Color** | Black |
| **Connector type** | RJ-45 shielded |
| **Product body material** | Flame retardant thermoplastic (PBT) UL 94V-0 |
| | Keystone jack: polycarbonate |
| **Electrical contact material** | Phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Conductor diameter** | 24 up to 22 AWG |
| **Assembly type** | T568A and T568B |
| **Protection index** | IP67 |

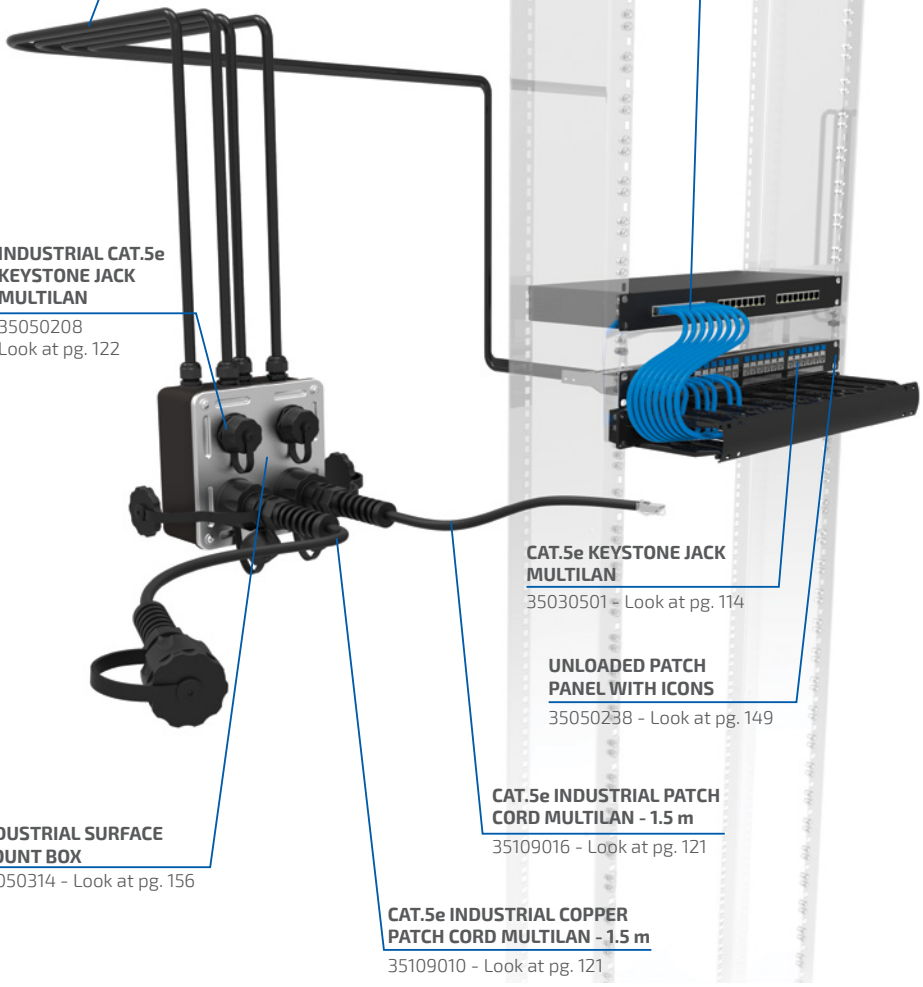
## Performance

| | |
|---|---|
| **Number of cycles** | ≥ 750 RJ-45 |
| **Insulation resistance** | 500 MΩ |
| **Contact resistance** | 20 mΩ |
| **DC resistance** | 0.1 Ω |
| **Dielectric voltage proof** | 1000 V (RMS, 60 Hz, 1 min) |
| **Return loss** | 1 ≤ f ≤ 31.5 Mhz: 30 dB |
| | 31.5 ≤ f ≤ 100 MHz: 20-20 log(f/100) |
| **Contact force** | 50 N (11l bf) per 60 s ± 5 s |

## Part Number

| | |
|---|---|
| 35050210 | Shielded Industrial CAT.5e Keystone Jack T568A/B |

# Industrial UTP Channel



**INDUSTRIAL DATA CABLE CAT.5e U/UTP**
23200083 - Look at pg. 120

**CAT.5e COPPER PATCH CORD MULTILAN - 1.5 m**
35103602 - Look at pg. 121

**INDUSTRIAL CAT.5e KEYSTONE JACK MULTILAN**
35050208
Look at pg. 122

**CAT.5e KEYSTONE JACK MULTILAN**
35030501 - Look at pg. 114

**UNLOADED PATCH PANEL WITH ICONS**
35050238 - Look at pg. 149

**CAT.5e INDUSTRIAL PATCH CORD MULTILAN - 1.5 m**
35109016 - Look at pg. 121

**INDUSTRIAL SURFACE MOUNT BOX**
35050314 - Look at pg. 156

**CAT.5e INDUSTRIAL COPPER PATCH CORD MULTILAN - 1.5 m**
35109010 - Look at pg. 121

# INDUSTRIAL DATA CABLE MULTILAN CAT.5e U/UTP 24AWG X 4P

Data cable for performing connections between patch panels in technical rooms and connectors at work areas.

## Constructive Characteristics

| | |
|---|---|
| **Shielding** | Unshielded (U/UTP) |
| **Color** | Black |
| **Nominal diameter** | 6.2 mm |
| **Weight** | 59 kg/km |
| **Outer sheath material** | TPU – for superior mechanical resistance against abrasion |
| | PVC 105º (DC-PVC) - for more chemical and dust resistance |
| **Flammability class** | CMX: UL 2556 VW-1 flame test standard for cable with outer sheath in TPU |
| | CM: UL 1685 standard for cable with outer sheath in PVC |
| **Number of pairs** | 4 pairs, 24 AWG |
| **Installation temperature** | From 0 °C to 50 °C |
| **Storage temperature** | From -20 °C to 75 °C |
| **Operation temperature** | From -20 °C to 60 °C |

## Performance

See more at performance table for CAT.5e data cables (pg. 123).

## Package

| | |
|---|---|
| Wood reel | |
| Standard cable run | 1000 m |

## Part Number

| | | |
|---|---|---|
| 23200083 | U/UTP Industrial | DC-PVC |
| 23200074 | | TPU |

# U/UTP CAT.5e INDUSTRIAL COPPER PATCH CORD MULTILAN

Accessory for services distribution in work areas.

## Constructive Characteristics

| | |
|---|---|
| **Length** | From 1.5 to 5 m |
| **Nominal diameter** | 7.6 mm |
| **Weight** | 0.070 kg/m |
| **Color** | Black |
| **Connector type** | RJ-45 |
| **Cable type** | U/UTP |
| **Conductor type** | Electrolytic copper, flexible, bare, composed by 7 wires with 0.2 mm diameter |
| **Outer sheath material** | TPU – for more mechanical resistance against abrasion |
| **Flammability class** | CMX |
| **Number of pairs** | 4 pairs, 24 AWG |
| **Electrical contact material** | 8 pins in phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Product body material** | Connector in flame retardant thermoplastic UL 94V-0 |
| | IP67 boot protector in special thermoplastic material PBT (Polybutylene Terephthalate) |
| **Assembly type** | T568A/B |

## Performance

See more at performance table for CAT.5e data cables (pg. 123).

## Part Number

| | | | |
|---|---|---|---|
| 35109010 | 1.5 m | T568-A/B | RJ-45 IP67 / RJ-45 IP67 |
| 35109002 | 2.5 m | | |
| 35109013 | 5 m | | |
| 35109016 | 1.5 m | | RJ-45 / RJ-45 IP67 |
| 35109007 | 2.5 m | | |
| 35109006 | 5 m | | |

Additional configurations available on request.

# INDUSTRIAL KEYSTONE JACK CAT.5e MULTILAN

Accessory for performing connections in work areas.

## Constructive Characteristics

| | |
|---|---|
| **Color** | Black |
| **Connector type** | RJ-45 |
| **Product body material** | High impact flame retardant thermoplastic (PBT) UL 94V-0 |
| | Keystone Jack: Polycarbonate |
| **Electrical contact material** | Phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Conductor diameter** | 22 to 24 AWG |
| **Standard assembly** | T568A/B |
| **Protection index** | IP67 |

## Performance

| | |
|---|---|
| **Number of cycles** | ≥ 750 RJ-45 |
| **Insulation resistance** | 500 MΩ |
| **Contact resistance** | 20 mΩ |
| **DC resistance** | 0.1 Ω |
| **Dielectric voltage proof** | 1000 V (RMS, 60 Hz, 1 min) |
| **Return loss** | 1 ≤ f ≤ 31.5 Mhz: 30 dB |
| | 31.5 ≤ f ≤ 100 MHz: 20-20 log(f/100) |
| **Contact force** | 50 N (11l bf) per 60 s ± 5 s |

## Part Number

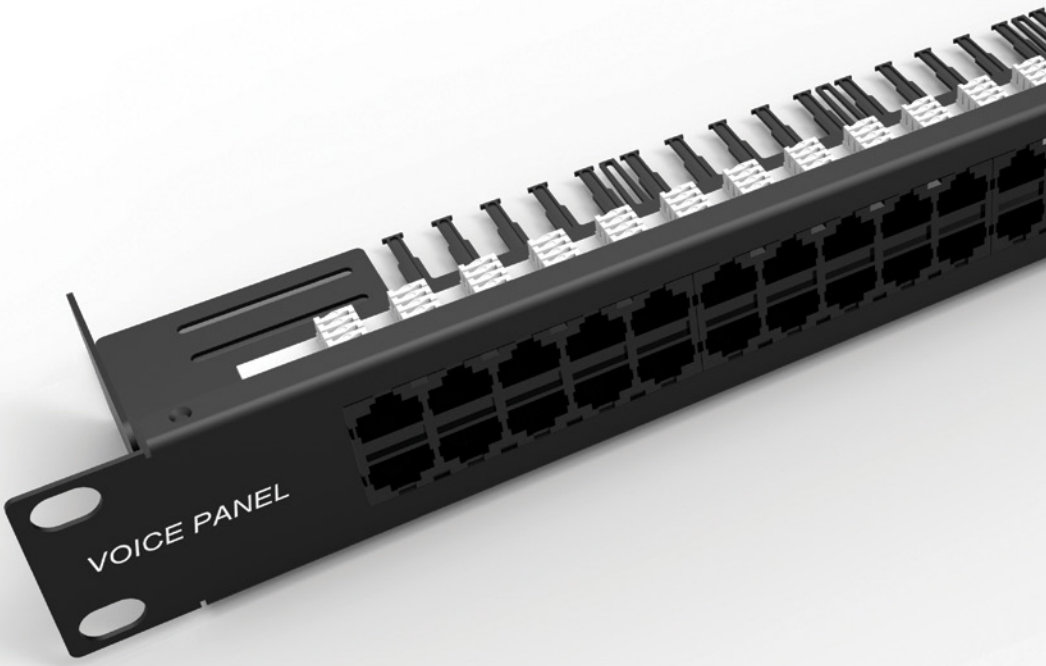
| | |
|---|---|
| 35050208 | Industrial Keystone Jack CAT.5e T568A/B |

# PERFORMANCE TABLE FOR CAT.5e DATA CABLES

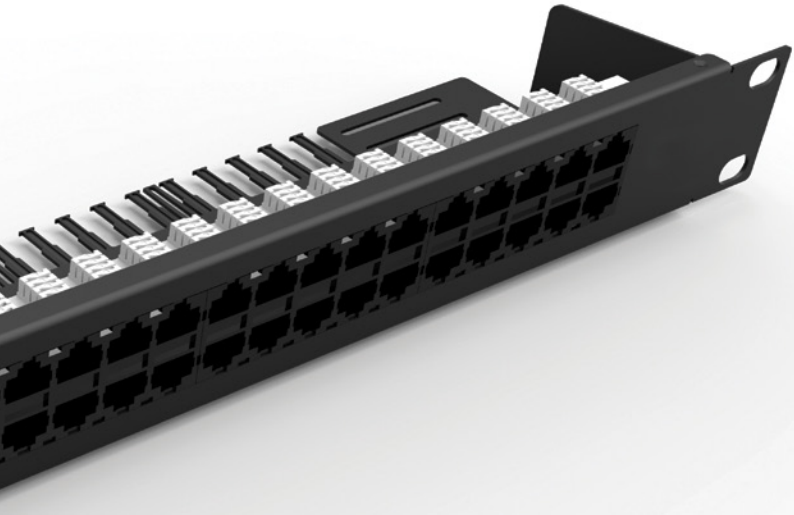
## Performance

| | | |
|---|---|---|
| **Maximum unbalance resistance** | 5 % | |
| **Conductor maximum DC electric resistance at 20°C** | 93.8 Ω/km | |
| **Maximum mutual capacitance 1kHz** | 56 pF/m | |
| **Maximum unbalance capacitance pair x ground** | 3.3 pF/m | |
| **Characteristic impedance** | 100 ± 15 % Ω | |
| **Maximum propagation delay** | 545 ns/100 m @ 10 MHz | |
| **Maximum delay skew** | 45 ns/100 m | |
| **NVP** | 68 % | |
| **Insulation resistance** | 10000 MΩ.km | |
| **Type** | **F/UTP** | **U/UTP** |
| **Electric voltage between conductors test** | 2500 VDC/3 s | 2500 VDC/3 s |
| **Electric voltage between conductors and shielding test** | 500 VDC/3s | - |

| Freq. (MHz) | Attenuation dB | | NEXT dB | | PSNEXT dB | | ACRF dB | | PSACRF dB | | RL dB | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TIA/EIA Max. | Typical | TIA/EIA Min. | Typical | TIA/EIA Min. | Typical | TIA/EIA Min. | Typical | TIA/EIA Min. | Typical | TIA/EIA Min. | Typical |
| 1 | 2.0 | 1.7 | 65.3 | 83.1 | 62.3 | 76.8 | 63.8 | 84.8 | 60.8 | 76.5 | 20.0 | 35.7 |
| 4 | 4.1 | 3.6 | 56.3 | 74.8 | 53.3 | 67.8 | 51.7 | 74.2 | 48.7 | 65.3 | 23.1 | 39.1 |
| 8 | 5.8 | 5.1 | 51.8 | 70.0 | 48.8 | 63.4 | 45.7 | 68.1 | 42.7 | 59.2 | 24.5 | 36.3 |
| 10 | 6.5 | 5.7 | 50.3 | 68.6 | 47.3 | 61.7 | 43.8 | 66.5 | 40.8 | 57.4 | 25.0 | 35.1 |
| 16 | 8.2 | 7.3 | 47.3 | 63.4 | 44.3 | 57.4 | 39.7 | 61.4 | 36.7 | 53.2 | 25.0 | 36.0 |
| 20 | 9.3 | 8.3 | 45.8 | 63.7 | 42.8 | 57.6 | 37.7 | 59.7 | 34.7 | 51.3 | 25.0 | 37.5 |
| 25 | 10.4 | 9.3 | 44.3 | 61.0 | 41.3 | 54.3 | 35.8 | 56.8 | 32.8 | 48.9 | 24.3 | 37.7 |
| 31.25 | 11.7 | 11.1 | 42.9 | 60.7 | 39.9 | 53.7 | 33.9 | 53.3 | 30.9 | 45.6 | 23.6 | 34.8 |
| 62.5 | 17.0 | 15.0 | 38.4 | 55.4 | 35.4 | 49.3 | 27.8 | 47.9 | 24.8 | 40.2 | 21.5 | 34.1 |
| 100 | 22.0 | 19.3 | 35.3 | 51.9 | 32.3 | 45.2 | 23.8 | 43.3 | 20.8 | 35.7 | 20.1 | 32.3 |
| 155 | - | 23.7 | - | 50.0 | - | 43.0 | - | 40.0 | - | 31.0 | - | 31.2 |
| 200 | - | 27.5 | - | 47.0 | - | 40.0 | - | 37.0 | - | 29.0 | - | 29.4 |
| 250 | - | 31.1 | - | 44.0 | - | 37.0 | - | 35.0 | - | 27.0 | - | 29.0 |
| 350 | - | 37.4 | - | 41.0 | - | 34.0 | - | 31.0 | - | 24.0 | - | 28.1 |


VOICE PANEL

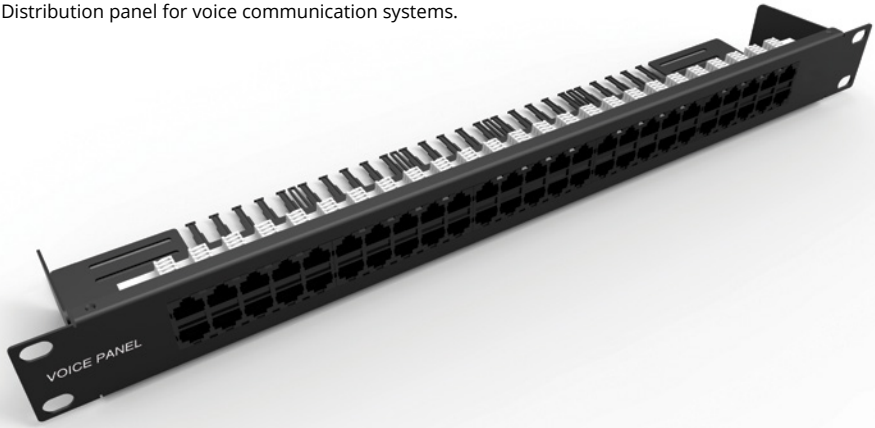
# FISAFLEX



**Voice Panels**
**Connection Blocks 110 IDC and Connectors**
**Patch Cords**

## VOICE PANEL CAT.3

Distribution panel for voice communication systems.




### Construtive Characteristics

| | | |
|---|---|---|
| **Width** 480 mm x **Height** 44.45 mm (1U) **Color** Black | | |
| **Connector type** | RJ-45 and 110 IDC | |
| **Positions amount** | 30 or 50 positions | |
| **Product body material** | Steel; Flame retardant transparent thermoplastic UL 94V-0 | |
| **Electrical contact material** | 110IDC | Phosphor bronze with 100 µin (2.54 µm) of lead/tin |
| | RJ-45 | Phosphor bronze with 50 µin (1.27 µm) of gold and 100 µin (2.54 µm) of nickel |
| **Conductor diameter** | 22 to 26 AWG | |

### Performance

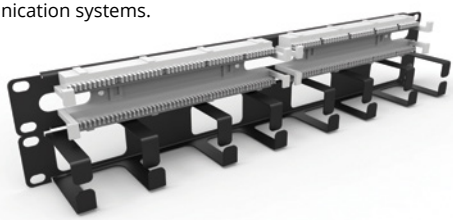
| | |
|---|---|
| **Retention force between jack and plug** | Minimum 50 N (60 s ± 5 s) |
| **Number of cycles** | ≥750 RJ-45 and ≥200 RJ-11 |
| | ≥ 200 in IDC block |
| **Isolation resistance** | 500 MΩ |
| **Contact resistance** | 20 mΩ |
| **DC resistance** | 0.1 Ω |
| **Applied electrical voltage test** | 1000 V (RMS, 60 Hz, 1 min) |

### Part Number

| | |
|---|---|
| 35030301 | CAT.3 30 Ports Voice Panel |
| 35030302 | CAT.3 50 Ports Voice Panel |

## 110 IDC CONNECTION PANEL

Distribution panel 110 IDC type for voice communication systems.



### Construtive Characteristics

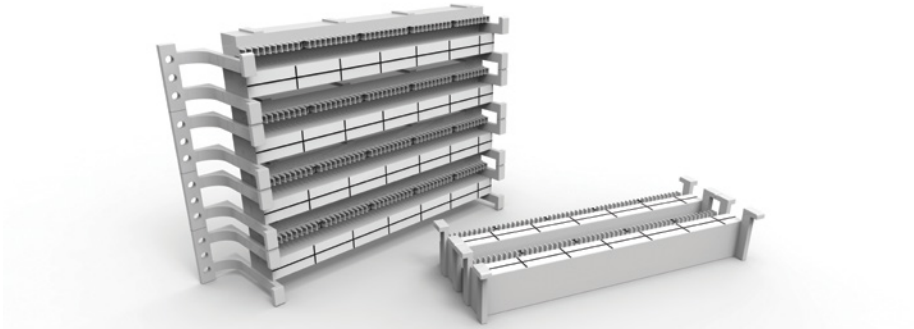
| | | | |
|---|---|---|---|
| **Color** | Metallic structure: Black | | |
| | Blocks: Beige | | |
| **Product body material** | Steel; Flame retardant thermoplastic UL 94V-0 | | |
| **Connector** | **Positions amount** | **Height** | **Width** |
| 110 IDC | 100 pairs | 88.9 mm | 482 mm |
| | 200 pairs | 177.8 mm | |

### Part Number

| | | |
|---|---|---|
| 35050698 | 100 pairs | 2U |
| 35050697 | 200 pairs | 4U |

## 110 IDC CONNECTION BLOCK

Connection block 110 IDC type for voice communication systems.



### Construtive Characteristics

| | |
|---|---|
| **Color** | Beige |
| **Conductor diameter** | 22 to 26 AWG |
| **Material type** | Flame retardant high impact thermoplastic UL 94V-0 |

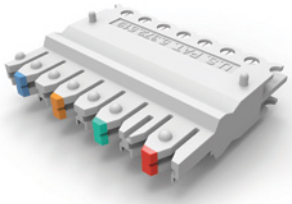
| **Positions amount** | **Height** | **Width** | **Depth** |
|---|---|---|---|
| 50 pairs | 44.45 mm | 272 mm | 38 mm (without legs) |
| 100 pairs | 88.9 mm | | 50 mm (with legs) |

### Part Number

| | | |
|---|---|---|
| 35050173 | 50 pairs | with legs |
| 35050191 | | without legs |
| 35050182 | 100 pairs | with legs |
| 35050644 | | without legs |

# 110 IDC CONNECTING BLOCK

Used together with 110 IDC connection panel or 110 IDC connection block, for distribution of voice communication system.



## Construtive Characteristics

| | | |
|---|---|---|
| **Color** | Beige | |
| **Connector type** | 110 IDC connecting block | |
| **Number of pairs** | CAT.6 | 4 pairs |
| | CAT.5e | 4 or 5 pairs |
| **Product body material** | High impact flame retardant thermoplastic UL 94V-0 | |
| **Electrical contact material** | Phosphor bronze with 100 µin (2.54 µm) of lead/tin | |
| **Conductor diameter** | 22 to 26 AWG | |

## Performance

| | |
|---|---|
| **Number of cycles** | ≥ 200 in IDC block |
| **Isolation resistance** | 500 MΩ |
| **Contact resistance** | 20 mΩ |
| **DC resistance** | 0.1 Ω |
| **Applied electrical voltage test** | 1000 V (RMS, 60 Hz, 1 min) |
| **Contact force** | 800 g |

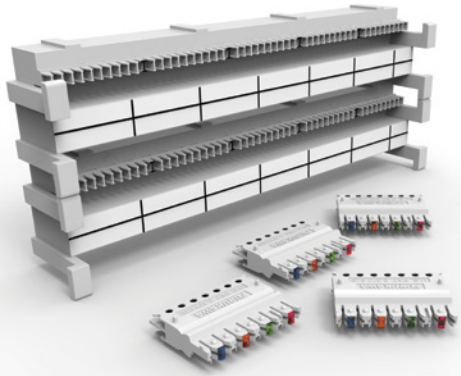
## Part Number

| | | |
|---|---|---|
| 35050349 | CAT. 6 | 4P |
| 35050374 | CAT.5e | 4P |
| 35050373 | | 5P |

Packages with 10 pieces.

# 110 IDC CONNECTION BLOCKS KIT

Kit composed of 110 IDC connection blocks and 110 IDC connecting blocks, used for distribution of communication systems.



## Construtive Characteristics

**Width** 272.3 mm x **Height** 88.9 mm x **Depth** 85 mm **Color** Beige

## Part Number

| | |
|---|---|
| 35050175 | Connection Block Kit 110 IDC CAT.5e 100 Pairs |

## PATCH CORD 110 IDC U/UTP FISAFLEX CAT.6

Patch cords for connecting distribution panels.

### Construtive Characteristics

| | | |
|---|---|---|
| **Length** | From 1.5 to 20 m | |
| **Nominal diameter** | 5.5 mm | |
| **Color** | Yellow, blue, white, red, gray, green or black | |
| **Connector type** | 110 IDC / 110 IDC | |
| | 110 IDC / RJ-45 | |
| **Cable type** | U/UTP CAT.6 | |
| **Conductor type** | Electrolytic copper, flexible, bare, composed by 7 wires of nominal diameter 0.2 mm | |
| **Flammability class** | CM (standard) | |
| **Number of pairs** | 4 pairs, 24 AWG | |
| **Electrical contact material** | 110 IDC | Phosphor bronze with 50 µin (1.27 µm) of gold and 100 µin (2.54 µm) of nickel |
| | RJ-45 | 8 pins in phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Product body material** | Flame retardant transparent thermoplastic UL 94V-0 | |
| **Assembly type** | T568A and T568B | |
| **Storage temperature** | From -40 °C to 70 °C | |
| **Operation temperature** | From -10 °C to 60 °C | |

### Performance

| | |
|---|---|
| **Conductor maximum DC electric resistance at 20°C** | 93.8 Ω/km |
| **Maximum mutual capacitance 1kHz** | 56 pF/m |
| **Characteristic impedance** | 100 ± 15 % Ω |
| **Electric voltage between conductors and shielding test** | 2500 VDC/3 s |

### Part Number

| | |
|---|---|
| 35120166 | 4 Pairs CAT. 6 Patch Cord FISAFLEX - CM - 110IDC/110IDC - 1.5 m - Gray (B50) |
| 35120167 | 4 Pairs CAT. 6 Patch Cord FISAFLEX - CM - 110IDC/110IDC - 2.5 m - Gray (B50) |
| 35120277 | 4 Pairs CAT. 6 Patch Cord FISAFLEX - CM - RJ-45/110IDC T568B - 1.5 m - Red (B50) |
| 35120243 | 4 Pairs CAT. 6 Patch Cord FISAFLEX - CM - RJ-45/110IDC T568A - 3.5 m - Red (B50) |

Additional configurations available on request.

# PATCH CORD 110 IDC U/UTP FISAFLEX CAT.5E

Patch cords for connecting distribution panels.

## Construtive Characteristics

| | | |
|---|---|---|
| **Length** | From 1.5 up to 20 m | |
| **Conductor type** | Electrolytic copper, flexible, bare, composed by 7 wires of nominal diameter 0.2 mm | |
| **Flammability class** | CM (standard) | |
| **Electrical contact material** | 110 IDC | Phosphor bronze with 50 µin (1.27 µm) of gold and 100 µin (2.54 µm) of nickel |
| | RJ-45 | 8 pins in phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel |
| **Product body material** | Flame retardant transparent thermoplastic UL 94V-0 | |
| **Assembly type** | T568A and T568B | |
| **Storage temperature** | From -40 °C to 70 °C | |
| **Operation temperature** | From -10 °C to 60 °C | |

| Connector | Cable type | Number of pairs (24 AWG) | Nominal diameter (mm) | Color |
|---|---|---|---|---|
| 110 IDC –110 IDC<br>110 IDC – RJ-45 | U/UTP CAT.5e | 1 | 3.6 | Blue |
| | | 2 | 4.6 | |
| | | 4 | 5.2 | Yellow, blue, white, red, gray, green and black |

## Performance

| | |
|---|---|
| **Conductor maximum DC electric resistance at 20°C** | 93.8 Ω/km |
| **Maximum mutual capacitance 1kHz** | 56 pF/m |
| **Characteristic impedance** | 100 ± 15 % Ω |
| **Electric voltage between conductors and shielding test** | 1500 VDC/3 s |
| **NVP** | 66 % |

## Part Number

| | | | |
|---|---|---|---|
| 35101791 | 1.5 m | RJ-45/110 IDC | Blue |
| 35101649 | | 110 IDC/110 IDC | |

# VOICE PATCH CORD U/UTP

Patch cords, assembled with RJ-45, for connecting distribution panels.

## Construtive Characteristics

| | | |
|---|---|---|
| **Length** | From 1.5 to 20 m | |
| **Weight** | 0.05 kg/m | |
| **Conductor type** | Electrolytic copper, flexible, bare, composed by 7 wires of nominal diameter 0.20 mm | |
| **Flammability class** | CM (standard) | |
| **Product body material** | 8 pins in phosphor bronze with 50 µin (1.27 µm) gold and 100 µin (2.54 µm) of nickel | |
| **Material type** | Flame retardant transparent thermoplastic UL 94V-0 | |
| **Assembly type** | 1 pair: pair 4 and 5 | 2 pairs: pairs 3 and 6, 4 and 5 |
| **Storage temperature** | From -40 °C to 70 °C | |
| **Operation temperature** | From -40 °C to 60 °C | |

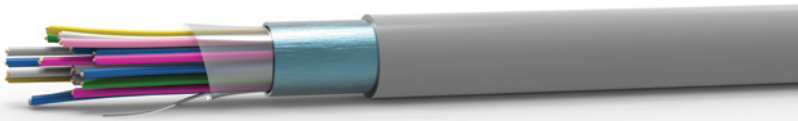
| Connector | Cable type | Number of pairs (24 AWG) | Nominal diameter (mm) | Color |
|---|---|---|---|---|
| RJ-45 | U/UTP | 1 | 3.6 | Blue |
| | | 2 | 4.6 | |
| | | 4 | 5.2 | Yellow, blue, white, red, gray, green and black |

## Part Number

| | | | | |
|---|---|---|---|---|
| 35100204 | 1,5 m | 1P | RJ-45 / RJ-45 | Blue |
| 35100200 | | 2P | 110IDC / 110IDC | |
| 35100290 | | 1P | | |

# DATA CABLE FISLAN CAT.3

Cable for voice communication and transmission.



## Construtive Characteristics

| | |
|---|---|
| **Color** | Gray |
| **Flammability class** | CMX or CM |
| **Installation temperature** | From 0 ºC to 60 °C |
| **Storage temperature** | From -20 °C to 70 °C |
| **Operation temperature** | From -10 °C to 60 ºC |

| Number of pairs (24 AWG) | Nominal outer diameter (mm) |
|---|---|
| 2 | 4 |
| 3 | 4.3 |
| 4 | 4.7 |
| 6 | 6.1 |
| 10 | 6.9 |
| 12 | 7.8 |
| 25 | 10.5 |

## Performance

| | | | |
|---|---|---|---|
| **Conductor maximum DC electric resistance at 20°C** | 93,8 Ω/km | | |
| **Maximum mutual capacitance** | 65 pF/m | | |
| **Characteristic impedance** | 100 ± 15 % Ω | | |
| **NVP** | 66 % | | |
| **Electric voltage between conductors test** | 1500 VDC/3 s | | |
| **Maximum attenuation (dB/100 m)** | 1 MHz | 2.6 | dB/100 m |
| | 4 MHz | 5.6 | |
| | 10 MHz | 9.7 | |
| | 16 MHz | 13.1 | |
| **NEXT** | 1 MHz | 41.3 | |
| | 4 MHz | 32.3 | |
| | 10 MHz | 26.6 | |
| | 16 MHz | 23.2 | |

## Part Number

| | |
|---|---|
| 23000002 | Data Cable FISLAN U/UTP 24AWGX2P - 100 - CAT. 3 (500 m) - Gray |
| 23000010 | Data Cable FISLAN U/UTP 24AWGX4P - 100 - CAT. 3 - Gray |
| 23000018 | Data Cable FISLAN U/UTP 24AWGX12P - 100 - CAT. 3 - Gray |
| 23000026 | Data Cable FISLAN U/UTP 24AWGX25P - 100 - CAT. 3 - Gray |

Additional configurations available on request.

**Cabinet for Enterprise Environment**
**Server Cabinet**
**ITMAX Rack**
**Open Rack for Enterprise**
**Cable Managers**
**Racks and Cabinets Complements**
**Flat and Angled Unloaded Patch Panels**
**Consolidation Points**
**Outlets, Faceplates and Surface Mount Boxes**
**Industrial Faceplates and Surface Mount Boxes**
**Supports and Adapters**
**Accessories and Tools**

# FISACESSO

# Cabinet for Enterprise Environment


## ENTERPRISE CABINET

19" cabinet, utilized in telecommunication rooms for enterprise environments.

### Construtive Characteristics

| | |
|---|---|
| **Product body material** | Steel SAE1020 |
| | Tempered glass (door) |

### Part Number

| Code | Description | Model | Height | Width | Depth |
|---|---|---|---|---|---|
| 35150177 | Enterprise Wall Cabinet 6U X 600mm X 450mm Disassembled | Wall | 6U's | 600 mm | 450 mm |
| 35150181 | Enterprise Wall Cabinet 12U X 600mm X 600mm Disassembled | Wall | 12U's | 600 mm | 600 mm |
| 35150178 | Enterprise Cabinet 22U X 600mm X 600mm Disassembled | Floor | 22U's | 600 mm | 600 mm |
| 35150182 | Enterprise Cabinet 42U X 600mm X 600mm Disassembled | Floor | 42U's | 600 mm | 600 mm |
| 35150179 | Enterprise Cabinet with Cable Manager 42U X 800mm X 800mm - Disassembled | Floor with cable guide | 42U's | 800 mm | 800 mm |
| 35150176 | Enterprise Cabinet with Cable Manager 42U X 800mm X 1000mm - Disassembled | Floor with cable guide | 42U's | 800 mm | 1000 mm |

## SLIDING TRAY

Product to be used in 19" racks, it has mobile rails for accommodation and organization of passive and active equipment.

### Constructive Characteristics

| **Height** 1U **Color** Black | |
|---|---|
| **Product body material** | Steel SAE 1020 |
| **Model** | Telescopic Rail |

### Part Number

| | |
|---|---|
| 35150546 | Sliding Tray 400 mm |
| 35150553 | Sliding Tray 500 mm |

## FIXED TRAY 4 POINTS

Product to be used in 19" racks for accommodation and organization of passive and active equipment.

### Constructive Characteristics

| **Height** 1U **Color** Black | |
|---|---|
| **Product body material** | Steel SAE 1020 |
| **Model** | Fixed in 4 points |

### Part Number

| | |
|---|---|
| 35150547 | Fixed Tray 400 mm |
| 35150548 | Fixed Tray 500 mm |
| 35150549 | Fixed Tray 600 mm |
| 35150550 | Fixed Tray 700 mm |
| 35150551 | Fixed Tray 800 mm |
| 35150552 | Fixed Tray 900 mm |

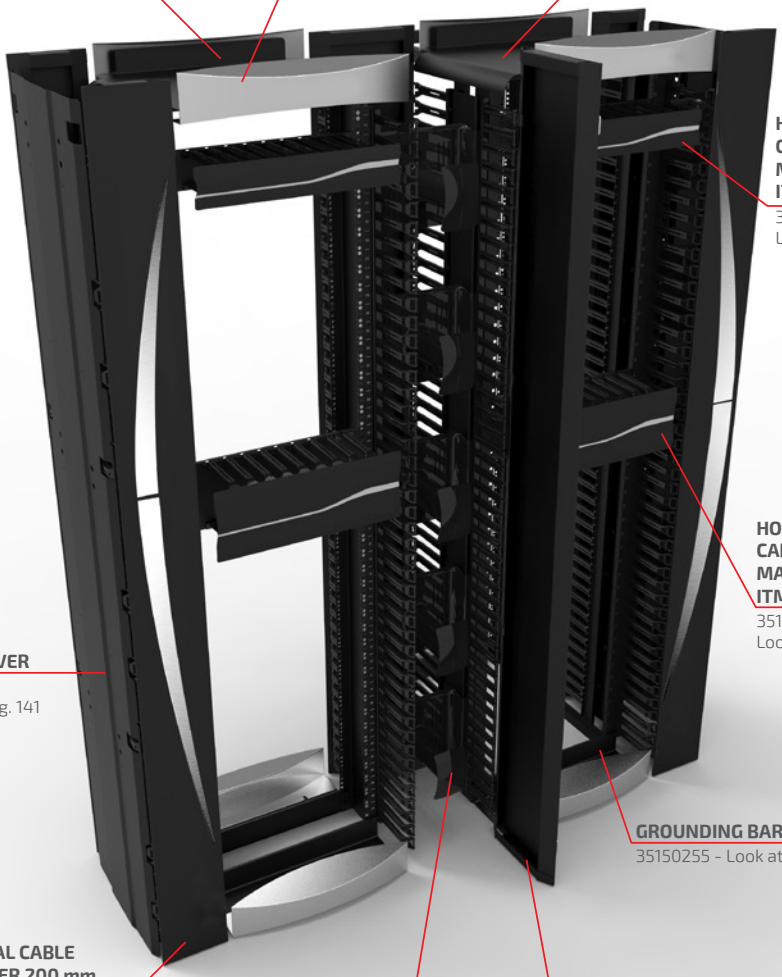
# Server Cabinet


## SERVER CABINET

| Construtive Characteristics | |
|---|---|
| **Width** 600 mm x **Height** 42 U x **Depth** 1100 mm **Color** Black | |
| **Product body material** | Steel SAE1020 |

| Part Number | |
|---|---|
| 35150327 | ITMAX Server Cabinet 42U X 600 mm X 1100 mm |

# ITMAX Rack



**UP AND BOTTOM RACK TRAY ITMAX**
35150405 - Look at pg. 139

**RACK 4 POSTS**
35150532 - Look at pg. 138

**RACK 2 POSTS**
35150531 - Look at pg. 138

**HORIZONTAL CABLE MANAGER 2U ITMAX**
35150406
Look at pg. 141

**HORIZONTAL CABLE MANAGER 4U ITMAX**
35150407
Look at pg. 141

**SIDE COVER**
35150108
Look at pg. 141

**GROUNDING BAR ITMAX**
35150255 - Look at pg. 139

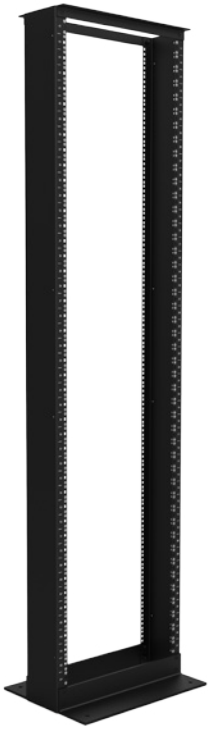
**VERTICAL CABLE MANAGER 200 mm**
35150106 - Look at pg. 140

**VERTICAL CABLE MANAGER 315 mm**
35150107 - Look at pg. 140

**PLASTIC SPOOL ITMAX**
35150409 - Look at pg. 139

## ITMAX OPEN RACK 2P 19" 45U

19" open rack for installation of cabling or network equipment in Data Centers.



### Construtive Characteristics

**Width** 526 mm x **Height** 2118 mm (45 U) x **Depth (base)** 404 mm
**Color** Black

| | |
|---|---|
| **Product body material** | Steel SAE1020 / aluminum |

### Part Number

| | |
|---|---|
| 35150531 | ITMAX Open Rack 2P 19" 45U |

## ITMAX OPEN RACK 4P 19" 45U

Four post 19" open rack, designed for applications with high density of cables.

### Construtive Characteristics

**Width** 526 mm x **Height** 2118 mm (45 U) x **Depth (base)** 914 mm
**Color** Black

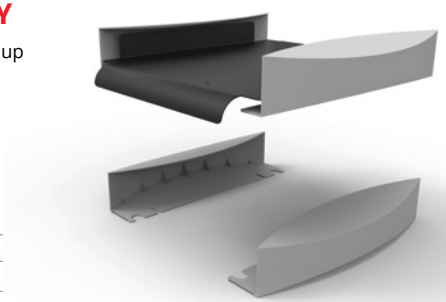
| | |
|---|---|
| **Product body material** | Steel SAE1020 / aluminum |

### Part Number

| | |
|---|---|
| 35150532 | ITMAX Open Rack 4P 19" 45U |

## ITMAX UP AND BOTTOM RACK TRAY

Allow correct routing of copper or optical cables in up and bottom parts of ITMAX rack.



### Construtive Characteristics

| | |
|---|---|
| **Width** 630 mm x **Height** 115 mm | |
| **Depth (base)** | Up rack: 605 mm |
| | Bottom rack: 170 mm |
| **Color** | Black and gray |
| **Product body material** | Steel SAE1020 and high impact thermoplastic |

### Part Number

| | |
|---|---|
| 35150405 | ITMAX Up and Bottom Rack Tray |

## ITMAX PLASTIC SPOOL

Allow accommodation and storing of patch cords and optical cords in vertical cable managers of ITMAX rack, with appropriate bending radius.

### Construtive Characteristics

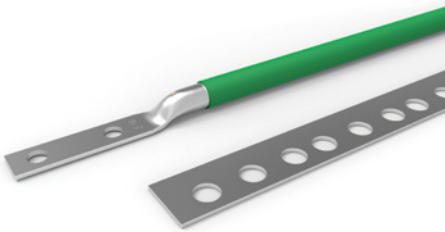
| | |
|---|---|
| **Width** 100 mm x **Height** 165 mm x **Depth (base)** 218 mm **Color** Black | |
| **Product body material** | High impact thermoplastic UL 94 V-0 |

### Part Number

| | |
|---|---|
| 35150409 | ITMAX Plastic Spool |

## ITMAX GROUNDING BAR

Enables correct grounding of equipment installed on ITMAX rack.



### Construtive Characteristics

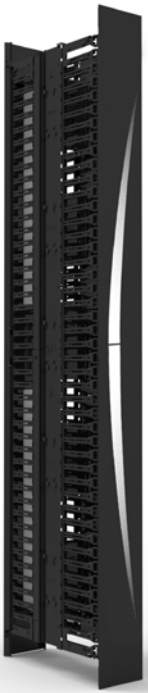
| | |
|---|---|
| **Width** 17 mm x **Height** 2000 mm x **Depth (base)** 1.3 mm **Color** Silver | |
| **Product body material** | Electrolytic tin coated copper wire |

### Part Number

| | |
|---|---|
| 35150255 | ITMAX Grounding Bar |

## ITMAX VERTICAL CABLE MANAGER 200 MM

Enables accommodation, routing and storing of copper or optical cables and cords vertically for high density ITMAX racks.



### Construtive Characteristics

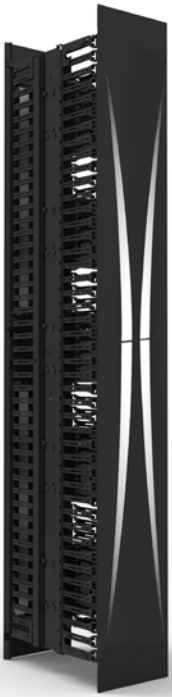
| | |
|---|---|
| **Width** 200 mm x **Height** 2173 mm x **Depth (base)** 512 mm<br>**Color** Black | |
| **Product body material** | Steel SAE1020 / aluminum |

### Part Number

| | |
|---|---|
| 35150106 | ITMAX Vertical Cable Manager 200 mm - Single Door |

## ITMAX VERTICAL CABLE MANAGER BETWEEN RACKS 315 MM

Enables accommodation, routing and storing of copper or optical cables and cords vertically for high density ITMAX racks.



### Construtive Characteristics

| | |
|---|---|
| **Width** 315 mm x **Height** 2173 mm x **Depth (base)** 512 mm<br>**Color** Black | |
| **Product body material** | Steel SAE1020 / aluminum |

### Part Number

| | |
|---|---|
| 35150107 | ITMAX Vertical Cable Manager Between Racks 315 mm - Single Door |

## ITMAX HORIZONTAL CABLE MANAGER 2U

Enables routing and accommodation of copper or optical cables and cords horizontally at 19″ racks.

### Construtive Characteristics

| | |
|---|---|
| **Width** 482.6 mm x **Height** 88.1 mm | |
| **Depth** | 183 mm (total) |
| | 161 mm (useful) |
| **Color** | Black |
| **Product body material** | Steel SAE1020, aluminum and thermoplastic material |

### Part Number

| | |
|---|---|
| 35150406 | ITMAX Horizontal Cable Manager 2U |

## ITMAX HORIZONTAL CABLE MANAGER 4U

Enables routing and accommodation of copper or optical cables and cords horizontally at 19″ racks.

### Construtive Characteristics

| | |
|---|---|
| **Width** 482.6 mm x **Height** 176.2 mm (4U) | |
| **Depth** | 183 mm (total) |
| | 161 mm (useful) |
| **Color** | Black |
| **Product body material** | Steel SAE1020 and high impact thermoplastic |

### Part Number

| | |
|---|---|
| 35150407 | ITMAX Horizontal Cable Manager 4U |

## ITMAX SIDE COVER

Enables better finishing of ITMAX rack installations.

### Construtive Characteristics

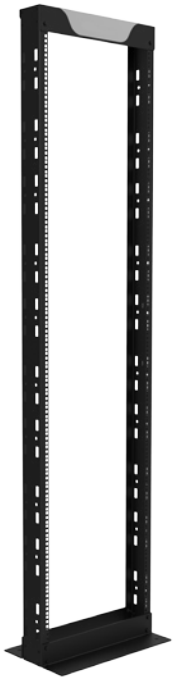
| | |
|---|---|
| **Width** 452 mm x **Height** 2150 mm (mounted) x **Depth (base)** 27 mm **Color** Black | |
| **Product body material** | Aluminum |

### Part Number

| | |
|---|---|
| 35150108 | ITMAX Side Cover for Vertical Manager - Single Door |

## OPEN RACK 19"

Open rack 19", with two posts, designed for medium cable density environments.



### Constructive Characteristics

| | |
|---|---|
| **Color** | Black |
| **Product body material** | Steel SAE1020 |

| Size | Height | Width | Depth (base) |
|---|---|---|---|
| 36U | 1775 mm | 520 mm | 315 mm |
| 45U | 2175 mm | | |

### Part Number

| | |
|---|---|
| 35150537 | 36U |
| 35150538 | 45U |

## ENTERPRISE VERTICAL CLOSED GUIDE DOUBLE FACE

Enables accommodation, routing and storing of copper or optical cables and cords vertically.

### Constructive Characteristics

| | |
|---|---|
| **Color** | Black |
| **Product body material** | Steel SAE1020 |

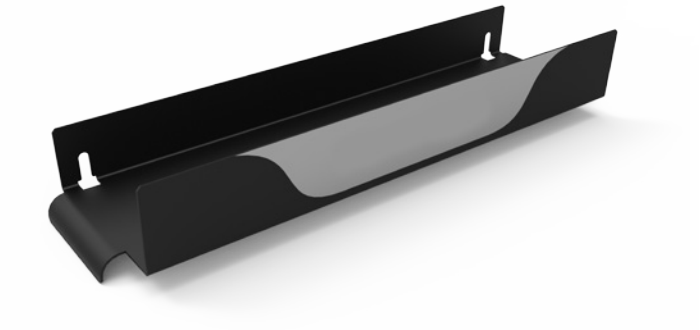
| Size | Height | Width | Depth (base) |
|---|---|---|---|
| 36U | 1772 mm | 170 mm | 392 mm |
| 45U | 2172 mm | | |

### Part Number

| | |
|---|---|
| 35150445 | 36U |
| 35150444 | 45U |

## ENTERPRISE TOP CABLE GUIDE

Enables routing of copper and optical cables in the upper part of the rack.



### Constructive Characteristics

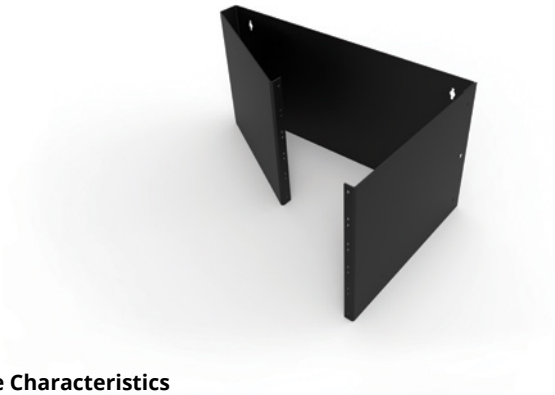
| | |
|---|---|
| **Width** 554 mm x **Height** 74 mm x **Depth (base)** 150 mm **Color** Black | |
| **Product body material** | Steel SAE1020 |

### Part Number

| | |
|---|---|
| 35150539 | Enterprise Top Cable Guide |

## ARTICULATE BRACKET 19"

Articulate bracket 19", wall-mount, and 5U height.



### Constructive Characteristics

| | |
|---|---|
| **Width** 488 mm x **Height** 235 mm x **Depth** 298 mm **Color** Black | |
| **Product body material** | Steel SAE1020 |

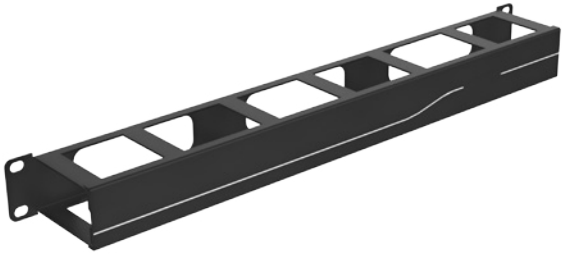
### Part Number

| | |
|---|---|
| 35150504 | Articulate Bracket 19"x 5U |

# Cable Managers

## CLOSED HORIZONTAL CABLE GUIDE 1U HIGH DENSITY

Enables routing and accommodation of copper or optical cables and cords horizontally at 19" racks.



### Constructive Characteristics

| | | |
|---|---|---|
| **Width** 482.6 mm x **Height** 44.45 mm (1U) | | |
| **Type** | 1U | 2U |
| **Depth** | 75 mm (high density) | 85 mm |
| | 69.5 mm (regular) | |
| **Color** | Black | |
| **Product body material** | Steel SAE1020 | |

### Part Number

| | |
|---|---|
| 35150500 | Closed Horizontal Cable Guide 1U High Density |
| 35150502 | Closed Horizontal Cable Guide 1U |
| 35150503 | Closed Horizontal Cable Guide 2U |

## OPEN HORIZONTAL CABLE MANAGER 1U HIGH DENSITY

Enables routing and accommodation of copper or optical cables and cords horizontally at 19" racks.

### Constructive Characteristics

| | |
|---|---|
| **Color** | Black |
| **Product body material** | Steel SAE1020 |

| Size | Height | Width | Depth (base) |
|---|---|---|---|
| 1U | 44.45 mm | 482 mm | 92 mm |
| 2U | 88.9 mm | | 85 mm |
| ½U | 22.22 mm | | 100 mm |

### Part Number

| | |
|---|---|
| 35150525 | 1U |
| 35150524 | 2U |
| 35150544 | ½U |

# CLOSED HORIZONTAL PLASTIC CABLE MANAGER

Enables routing and accommodation of copper or optical cables and cords horizontally at 19” racks.

## Constructive Characteristics

| | |
|---|---|
| **Color** | Black |
| **Product body material** | Cover and organizers: High impact thermoplastic UL 94 V-0 |

| Size | Height | Width | Depth (base) |
|---|---|---|---|
| 1U | 44.45 mm | 482 mm | 75 mm |

## Part Number

| | |
|---|---|
| 35050285 | 1U |

# CLOSED HORIZONTAL PLASTIC CABLE MANAGER HIGH DENSITY

Enables routing and accommodation of copper or optical cables and cords horizontally at 19” racks.

## Constructive Characteristics

| | |
|---|---|
| **Color** | Black |
| **Product body material** | High impact ABS plastic |

| Size | Height | Width | Depth (base) |
|---|---|---|---|
| 1U | 44.3 mm | 482 mm | 160 mm |
| 2U | 88.9 mm | | 170 mm |

## Part Number

| | |
|---|---|
| 35050288 | 1U |
| 35050303 | 2U |

## REAR CABLE MANAGER

Enables accommodation of copper or optical cables.

### Constructive Characteristics

| | |
|---|---|
| **Width** 482 mm x **Height** 44.45 mm (1U) x **Depth** 100 mm **Color** Black | |
| **Product body material** | Steel SAE1020 |

### Part Number

| | |
|---|---|
| 35150526 | Rear Cable Manager |

# Racks and Cabinets Complements

## EXTENDED SHELF FOR RACK

Enables accommodation and organization of passive and active equipment at 19" racks.

### Constructive Characteristics

| | |
|---|---|
| **Color** | Black |
| **Product body material** | Steel SAE1020 |

| Type | Height | Width | Depth (base) |
|---|---|---|---|
| Standard | 44.45 mm (1U) | 482 mm | 290 mm |
| Vented | 88.9 mm (2U) | | |
| Extended | | | 482 mm |

### Part Number

| | | |
|---|---|---|
| 35150556 | Extended | |
| 35150561 | Vented | |
| 35150555 | Standard | 2U |
| 35150554 | | 1U |

## CLAMP FOR VERTICAL ORGANIZATION

Enables accommodation of copper or optical cables vertically at the rack.

### Constructive Characteristics

| | |
|---|---|
| **Width** 44 mm x **Height** 43.7mm x **Depth** 86 mm **Color** Black | |
| **Product body material** | Steel SAE1020 |

### Part Number

| | |
|---|---|
| 35150528 | Clamp for Vertical Organization |

## ANGLED BLANK PANEL 1U

Product for utilization in 19" rack, enables closing of rack units.

### Constructive Characteristics

| | |
|---|---|
| **Width** 482 mm x **Height** 44.45 mm (1U) x **Depth** 110 mm **Color** Black | |
| **Product body material** | Steel SAE1020 |

### Part Number

| | |
|---|---|
| 35150557 | Angled Blank Panel 1U |

## BLANK PANEL

Product for utilization in 19" rack, enables closing of rack units.

### Constructive Characteristics

| | |
|---|---|
| **Color** | Black |
| **Product body material** | Steel SAE1020 |

| Height | Width | Depth |
|---|---|---|
| 44.45 mm (1U) | 482 mm | 12 mm |
| 88.9 mm (2U) | | |
| 177.8 mm (4U) | | |
| 22.22 mm (½U) | | |

### Part Number

| | |
|---|---|
| 35150512 | 1U |
| 35150558 | 2U |
| 35150560 | 4U |
| 35150542 | ½U |

## PLASTIC BLANK PANEL 1U

Product for utilization in 19" rack, enables closing of rack units.

### Constructive Characteristics

| | |
|---|---|
| **Width** 482 mm x **Height** 44.45 mm (1U) x **Depth** 28 mm **Color** Black | |
| **Product body material** | High impact ABS plastic |

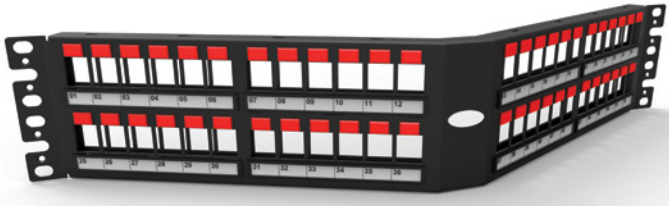
### Part Number

| | |
|---|---|
| 35050787 | Plastic Blank Panel 1U (5 Pieces) |

# Unloaded Flat and Angled Patch Panels

## SHIELDED ANGLED PATCH PANEL

Installed in 19" racks, enables organization of structured cabling through RJ-45 keystone jacks installation.



### Constructive Characteristics

| | |
|---|---|
| **Color** | Black |
| **Product body material** | Steel SAE1020 / nickel steel |

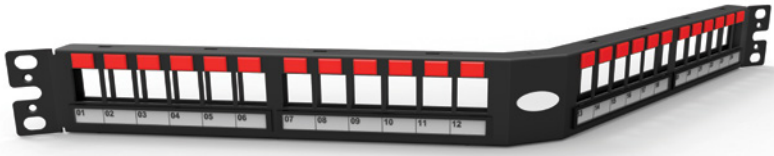
| Size | Number of ports | Height | Width | Depth |
|---|---|---|---|---|
| 1U | 24 ports | 44.45 mm | 482.6 mm | 110 mm |
| 2U | 48/72 ports | 88.1 mm | | |

### Part Number

| | |
|---|---|
| 35050809 | 24P Shielded Angled 1U |
| 35050810 | 48P Shielded Angled 2U |
| 35050811 | 72P Shielded Angled 2U |

## ANGLED PATCH PANEL

Installed in 19" racks, enables organization of structured cabling through RJ-45 keystone jacks installation.



### Constructive Characteristics

| | |
|---|---|
| **Color** | Black |
| **Product body material** | Steel SAE1020 |

| Size | Number of ports | Height | Width | Depth |
|---|---|---|---|---|
| 1U | 24 ports | 44.45 mm | 482.6 mm | 110 mm |
| 2U | 48 ports | 88.1 mm | | |

### Part Number

| | |
|---|---|
| 35050808 | 24P Angled Patch Panel 1U |
| 35050807 | 48P Angled Patch Panel 2U |

## SHIELDED ANGLED PATCH PANEL ½U

Installed in 19" racks, enables organization of structured cabling through RJ-45 keystone jacks installation.

### Constructive Characteristics

| | |
|---|---|
| **Product body material** | Steel SAE1020 |

| Size | Number of ports | Height | Width | Depth |
|---|---|---|---|---|
| ½U | 24 ports | 22.22 mm | 482.6 mm | 110 mm |

### Part Number

| | |
|---|---|
| 35050398 | Shielded Angled Patch Panel 24P ½U |
| 35150543 | Angled Blank Panel ½U |

## SHIELDED MODULAR PATCH PANEL WITH ICONS

Installed in 19" racks, enables organization of structured cabling through RJ-45 keystone jack s installation.

### Constructive Characteristics

| | |
|---|---|
| **Color** | Black |
| **Product body material** | Steel SAE1020 and high impact thermoplastic |

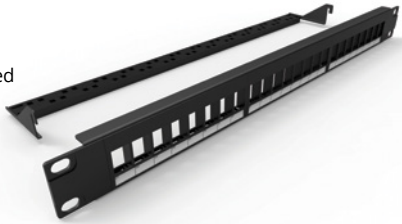
| Number of ports | Height | Width | Depth | Compatible connector type |
|---|---|---|---|---|
| 24 ports | 44.45 mm | 482.6 mm | 110 mm | RJ-45 F/UTP 5e, 6 or 6A. |

### Part Number

| | |
|---|---|
| 35050234 | Shielded Modular Patch Panel 24P with Identification Icons (Unloaded) |

## PATCH PANEL WITH ICONS

Installed in 19" racks, enables organization of structured cabling through RJ-45 keystone jacks installation.



### Constructive Characteristics

| | |
|---|---|
| **Color** | Black |
| **Product body material** | Steel SAE1020 and high impact thermoplastic |

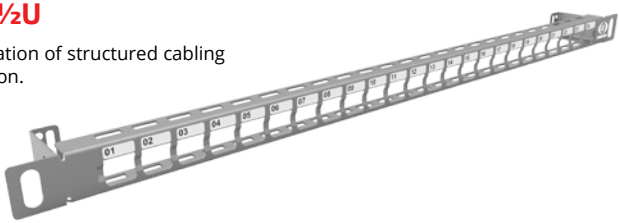
| Number of ports | Height | Width | Depth | Compatible connector type |
|---|---|---|---|---|
| 24 ports | 44.45 mm | 482.6 mm | 78 mm (with rear guide) | RJ-45 U/UTP |
| | | | | Optical adapters SC, LC, F and blind cover |

### Part Number

| | |
|---|---|
| 35050238 | Modular Patch Panel 24P with Identification Icons (Unloaded) |

## SHIELDED PATCH PANEL ½U

Installed in 19" racks, enables organization of structured cabling through RJ-45 keystone jacks installation.



### Constructive Characteristics

| | |
|---|---|
| **Product body material** | Steel SAE 1020 |

| Size | Number of ports | Height | Width | Depth |
|---|---|---|---|---|
| ½U | 24 ports | 22.2 mm | 482.6 mm | 31 mm |

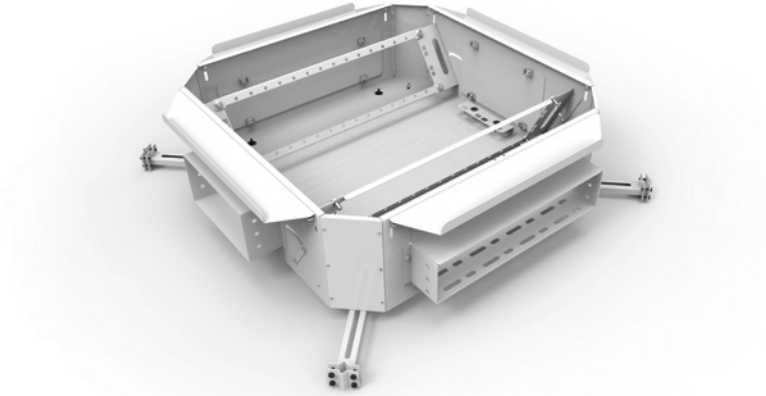
### Part Number

| | |
|---|---|
| 35050308 | Shielded Patch Panel 24P ½U (Unloaded) |

# Consolidation Points

## CONSOLIDATION POINT HIGH DENSITY - ZDA

Installed under technical floor, enables structured cabling connections organization through assembly of RJ-45 keystone jacks in patch panels or LGX cassettes/plates in scalable way.



### Constructive Characteristics

| | |
|---|---|
| **Height** | 180 mm |
| **Width** | 580 mm (without flaps) |
| **Depth** | |
| **Number of ports** | Maximum 288 ports according to TIA/EIA-942 standard |
| | 336 optical fibers |
| **Color** | Light gray |
| **Product body material** | Aluminum: Box, lid, frame and cable entrance |
| | Carbon steel SAE1020: Inner and outer supports |

### Part Number

| | |
|---|---|
| 35150505 | Consolidation Point High Density - ZDA 6U |
| 35150506 | Consolidation Point High Density - ZDA 12U |

# UNLOADED STACKABLE CONSOLIDATION POINT 24 PORT CAPACITY

Installed under technical floor, enables structured cabling connections organization through assembly of RJ-45 keystone jacks or optical adapters in scalable way.

## Constructive Characteristics

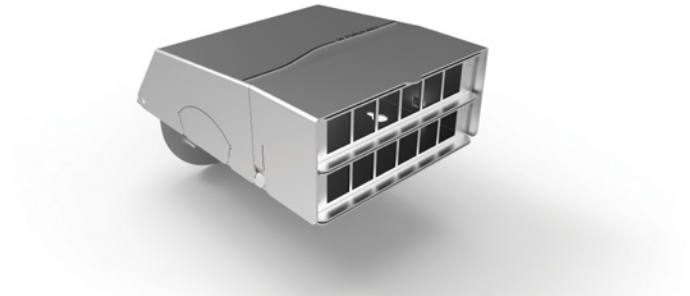
| | |
|---|---|
| **Width** 355 mm x **Height** 45 mm x **Depth** 315 mm **Color** Black with silver | |
| **Number of ports** | 24 port capacity – copper or optical |
| **Product body material** | Stainless Steel |

## Part Number

| | |
|---|---|
| 35150513 | Unloaded Stackable Consolidation Point 24 Port Capacity |

# UNLOADED SHIELDED 12 POSITIONS CONSOLIDATION POINT

Installed under technical floor, enables structured cabling connections organization through assembly of RJ-45 keystone jacks or optical adapters in scalable way.



## Constructive Characteristics

| | |
|---|---|
| **Width** 126.5 mm x **Height** 58.5 mm x **Depth** 180 mm **Color** Silver | |
| **Number of ports** | 12 copper or optical ports |
| **Product body material** | Stainless Steel |

## Part Number

| | |
|---|---|
| 35150514 | Unloaded Shielded 12 Port Capacity Consolidation Point |

## MULTIMEDIA SURFACE MOUNT BOX

Enables structured cabling connections organization through assembly of RJ-45 keystone jacks or optical adapters in scalable way.

### Constructive Characteristics

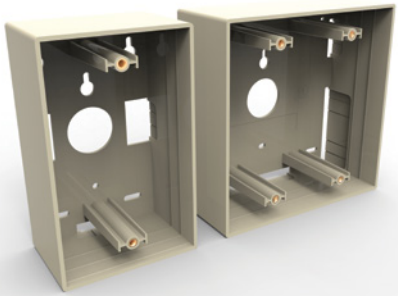
| | |
|---|---|
| **Width** 170 mm x **Height** 30 mm x **Depth** 110 mm **Color** Beige | |
| **Number of ports** | 06 or 12 ports |
| **Compatible connector type** | RJ-11, RJ-45, SC, LC, F and blind cover |
| **Product body material** | Thermoplastic |

### Part Number

| | |
|---|---|
| 35050523 | Multimedia Surface Mount Box 6P - MUTOA |
| 35050533 | Multimedia Surface Mount Box 12P - MUTOA |

## SURFACE MOUNT BOX

Indicated for surface mounting where infrastructure for flush mounting is not available.



### Constructive Characteristics

| | |
|---|---|
| **Color** | White and beige |
| **Product body material** | High impact ABS thermoplastic |

| Type | Height | Width | Depth |
|---|---|---|---|
| Single (4X2”) | 114 mm | 69 mm | 48 mm |
| Double (4X4”) | | 116.2 mm | |

### Part Number

| | | |
|---|---|---|
| 35060029 | (4X4”) | Beige |
| 35060028 | (4X2”) | |
| 35060042 | (4X2”) | White |
| 35060050 | (4X4”) | |

# SHUTTERED SURFACE MOUNT BOX

Indicated for places where infrastructure for flush mounting or surface mounting, in walls, is available.

## Constructive Characteristics

| | |
|---|---|
| **Color** | Beige, white and gray |
| **Connector type** | RJ-11, RJ-45, SC, LC, F or blind cover |
| **Product body material** | High impact ABS thermoplastic |

| Number of ports | Height | Width | Depth |
|---|---|---|---|
| 01 | 44.45 mm | 65 mm | 19 mm |
| 02 | 75.5 mm | | |

## Part Number

| | | |
|---|---|---|
| 35050256 | 1 Port | Beige |
| 35050255 | | White |
| 35050257 | | Gray |
| 35050259 | 2 Ports | Beige |
| 35050258 | | White |
| 35050260 | | Gray |
| 35050510 | 1 Shielded port | Beige |
| 35050511 | 2 Shielded ports | |

# FLAT FACEPLATE

Indicated for places where infrastructure for flush mounting or surface mounting, in walls, is available.

## Constructive Characteristics

| | |
|---|---|
| **Color** | White |
| **Product body material** | Flame retardant thermoplastic UL 94 V-0 |

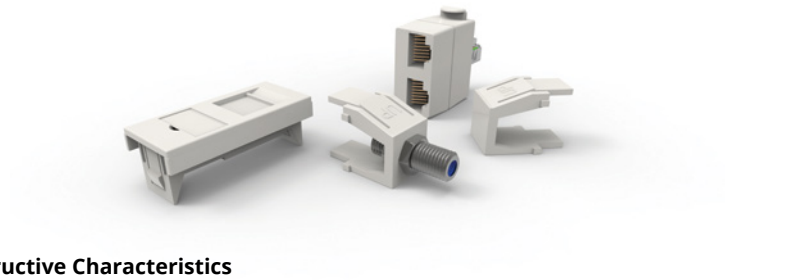
| Number of ports | Height | Width | Depth | Connector type |
|---|---|---|---|---|
| 01, 02 and 04 (4x2") | 114.3 mm | 69.8 mm | 10 mm | RJ-45, SC, LC, F and blind cover |
| 06 (4x4") | 114.3 mm | 114.3 mm | | |
| 02 (86 x 86 mm) | 86 mm | 86 mm | | |

## Part Number

| | |
|---|---|
| 35050305 | Flat Faceplate 1P - White (4x2) |
| 35050306 | Flat Faceplate 2P - White (4x2) |
| 35050307 | Flat Faceplate 4P - White (4x2) |
| 35050093 | Flat Faceplate 6P - White (4x4) |
| 35050383 | Faceplate 2P -European Standard (86x86) - White |

# ADAPTER SET

Adapter set and accessories for termination of structured cabling.



## Constructive Characteristics

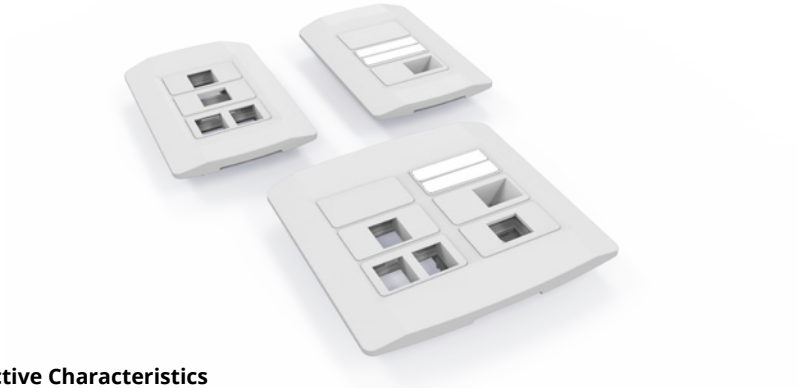
| | | |
|---|---|---|
| **F connector** | **Color** | Beige |
| | | White |
| | | Gray |
| | **Number of ports** | 01 Port |
| **Y adapter (RJ-45)** | **Color** | White |
| | **Number of ports** | 01 or 02 ports |
| | **Assembly type** | Voice |
| | | Modular |
| | | 10Base-T |
| **Adapter set for flat faceplate** | **Color** | White |
| | **Number of ports** | 01 Port |
| | **Connector type** | RJ-45 |
| **Blind cover** | **Color** | Beige |
| | | Gray |
| | | White |
| | | Black |
| | **Number of ports** | 01 Port |
| | **Product body material** | Thermoplastic / Metallic |

## Part Number

| | | |
|---|---|---|
| 35050344 | Optical Assembly Adapter F Beige (5 Pieces) | Beige |
| 35050379 | | White |
| 35050376 | | Gray |
| 35050663 | Modular "Y " Wiring Adaptor - Voice Channel | |
| 35050662 | Modular Divider | |
| 35050664 | Data Channel Divider | |
| 35050250 | European Faceplate Adapter 45x22.5 cm | White |
| 35050372 | Blind Cover (10 Pieces) | Beige |
| 35050371 | | White |
| 35050370 | | Gray |
| 35050369 | | Black (epoxy) |

## MODULAR FACEPLATE

Indicated for places where infrastructure for flush mounting or surface mounting, in walls, is available.



### Constructive Characteristics

| | |
|---|---|
| **Color** | White |
| **Product body material** | High impact ABS thermoplastic |

### Part Number

| | | |
|---|---|---|
| 35050719 | White Modular Faceplate - 4X2 | 03 modules |
| 35050723 | White Modular Faceplate - 4X4 | 06 modules |

## FACEPLATE MODULES

Modules compatible with modular faceplates for structured cabling termination.

### Constructive Characteristics

| | |
|---|---|
| **Number of ports** | 1 or 2 ports |
| **Product body material** | Flame retardant thermoplastic UL 94 V-0 |
| **Connector type compatible** | SC, ST, FJ, LC, coaxial, F and RCA |
| **Color** | White |

### Part Number

| | | | |
|---|---|---|---|
| 35050724 | Vertical Adapter Module | 1 Port | White |
| 35050728 | Horizontal Adapter Module | | |
| 35050722 | Angled Adapter Module | | |
| 35050720 | Adapter Module | 2 Ports | |
| 35050725 | Blind Cover | - | |
| 35050721 | Label And Icon Module | | |

# Industrial Faceplates and Surface Mount Boxes

## INDUSTRIAL SURFACE MOUNT BOX

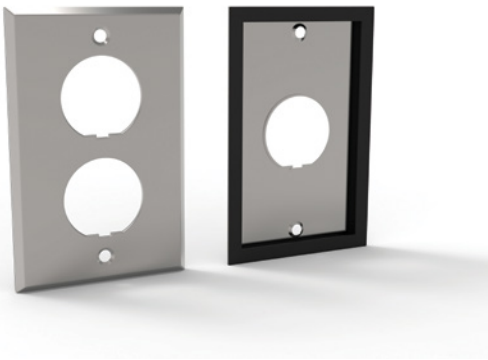
Surface mount box for utilization with Industrial solution IP67. Avoid water and dust penetration in harsh environment.

### Constructive Characteristics

| | | |
|---|---|---|
| **Box (4x4")** | Height | 128 mm |
| | Width | 128 mm |
| | Depth | 66 mm |
| **Color** | White and silver | |
| **Number of ports** | 01, 02 and 04 ports | |
| **Product body material** | Box in thermoplastic material | |
| | Faceplate in stainless steel | |

## FACEPLATE INDUSTRIAL IP67

Faceplate for utilization with Industrial solution IP67. Avoid water and dust penetration in harsh environment.



### Constructive Characteristics

| | |
|---|---|
| **Width** 175 mm x **Height** 53 mm x **Depth** 140 mm **Color** Silver | |
| **Number of ports** | 01 and 02 ports |
| **Product body material** | Stainless Steel |

### Part Number

| | |
|---|---|
| 35050141 | 1 Port |
| 35050036 | 2 Ports |

## IP67 BLIND COVER (PKG 2 PCS)

Blind cover compatible with Surface Box and Faceplates IP67.

### Constructive Characteristics

| | |
|---|---|
| **Color** | Black |
| **Product body material** | High Impact Thermoplastic |
| **Number of ports** | 1 |
| **Dimensions** | M25 X 1,5mm |

### Part Number

| | |
|---|---|
| 35150332 | IP67 Blind Cover (PKG 2 PCS) |

## LGX PLATE KIT FOR KEYSTONE JACKS AND OPTICAL ADAPTERS

Plates for accommodation of optical and copper adapters, compatible with LGX systems.

### Constructive Characteristics

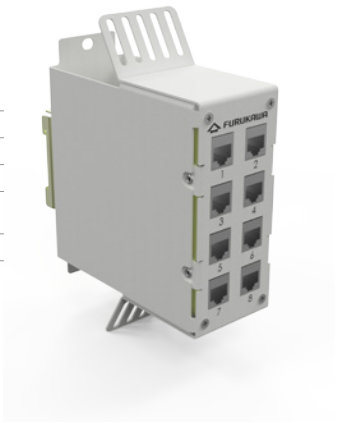
| | |
|---|---|
| **Width** 129.6 mm x **Height** 29.2 mm **Color** Black | |
| **Painting type** | Epoxy |
| **Number of ports** | 06, 08 or 12 ports, according to connector type (supplied in kits with 03 pieces) |
| **Product body material** | Plastic or metallic |

### Part Number

| | | | | |
|---|---|---|---|---|
| 35050821 | Kit 3X LGX Plates | 06P | RJ-45 | Steel SAE1020 |
| 35050822 | | | RJ-45 - Shielded | |
| 35260602 | | 08P | LC/SC | |
| 35260074 | | 12P | | |
| 35260603 | | 08P | ST/FC | |
| 35265040 | | 06P | LC/SC | Plastic |
| 35265041 | | 08P | | |
| 35265042 | | 12P | | |
| 35265043 | | 06P | MPO | |

## 8P DIN RAIL PATCH PANEL

Patch panel compatible with DIN rail installations.




### Constructive Characteristics

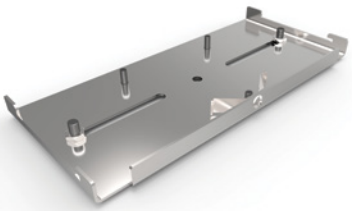
| | |
|---|---|
| **Width** 192 mm x **Height** 57 mm x **Depth** 135 mm **Color** Gray | |
| **Number of ports** | 8 |
| **Product body material** | Steel |

### Part Number

| | |
|---|---|
| 35150333 | 8P DIN Rail Patch Panel |

## BASE FOR DIN RAIL

Base for installation of products compatible with DIN rail.



### Constructive Characteristics

| | |
|---|---|
| **Width** 132 mm x **Height** 61 mm x **Depth** 11 mm | |
| **Product body material** | Steel |

### Part Number

| | |
|---|---|
| 35150250 | Base for DIN Rail - ODF (5 Pieces) |

## ADAPTER FOR DIN RAIL

Adapter for optical and copper connectors compatible with DIN Rail.

### Constructive Characteristics

| | |
|---|---|
| **Height** | 68 mm |
| **Width** | 18 mm (without cover) |
| | 21 mm (with cover) |
| **Depth** | 70 mm |
| **Color** | Light gray |
| **Product body material** | High impact thermoplastic UL 94 V-0 |

### Part Number

| | |
|---|---|
| 35050362 | Adapter for Din Rail 1P |

## ACCOMMODATION SUPPORT FOR CABLES

Accommodation support for cables in racks and vertical guides.

### Constructive Characteristics

| | |
|---|---|
| **Width** 25 mm x **Height** 88 mm x **Depth** 126 mm | |
| **Product body material** | Steel SAE 1020 |

### Part Number

| | |
|---|---|
| 35152675 | Accommodation Support for Cables (Anchor) |

## IDENTIFICATION ICONS

Composed by colored plastic panels, that should be assembled in the front part of connectors patch panels, faceplates and outlets.

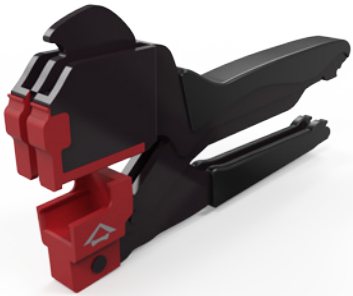
### Part Number

| | | |
|---|---|---|
| 35050334 | 50 pieces | Yellow |
| 35050331 | | Blue |
| 35050330 | | White |
| 35050329 | | Gray |
| 35050375 | | Orange |
| 35050338 | | Brown |
| 35050337 | | Green |
| 35050336 | | Red |
| 35050335 | | Violet |

# Tools and Accessories

## TOOLS

Tools indicated to facilitate the connection of several finishing accessories.



### Part Number

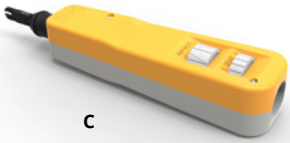
| | |
|---|---|
| 35030001 | Fast Connect Tool for UTP Cable (Compatible with new UTP 90º/180º CAT.5e and UTP CAT.6) |

### Part Number

| | |
|---|---|
| 35060301 | Premium Fast Connect Tool for UTP Cable (Compatible with UTP CAT.5e Premium, UTP CAT.6 Premium, UTP CAT.6A) |
| 35060302 | Module for Crimping Fast Premium |

B

A



C

### Part Number

| | | |
|---|---|---|
| 35030000 | A | Modular Plug Hand Tool for UTP Cable |
| 35050324 | B | 110 IDC Connection Tool |
| 35050332 | C | 110 IDC Termination Tool |
| 35050027 | | Blade (110 IDC Type) |

### Part Number

| | |
|---|---|
| 35050299 | Keystone Jack Termination Fixture |

# Optical Cables

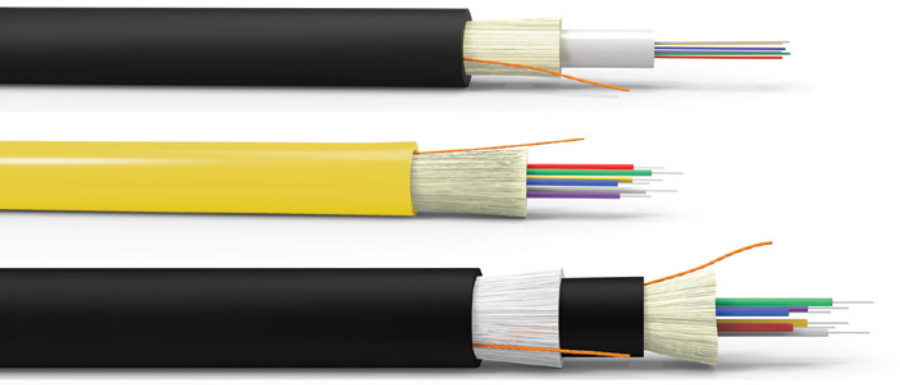
*Entertainment, services and information in high speed.*

The fast technological advancement of communications and the necessity of higher transmission rates that allow several services as multimedia, Internet, teleconference and others made optical fibers and cables the best transmission media.

Furukawa optical cables are made with materials suitable for several uses, in indoor premises networks as well as termination networks (indoor/outdoor), in aerial or underground installations.

## Optical Cables for Premises Networks

Termination network
Indoor network



## OPTICAL CABLE FIBER-LAN INDOOR/OUTDOOR

| | |
|---|---|
| **Denomination** | CFOT-EO |
| **Description** | Tight-buffered cable, composed by optical fibers with secondary coating (900 µm), surrounded by dielectric strength members and covered by a flame retardant jacket with UV protection. |
| **Application** | Installation environment: indoor/outdoor. |
| | Operation environment: in ducts or underground manhole susceptible to temporary inundation. |

### Construtive Characteristics

| | | |
|---|---|---|
| **Fiber types** | Multimode (50/125) | OM4, OM3 and OM2 |
| | Multimode (62.5/125) | OM1 |
| | Single-Mode (9/125) | G.652.D and G.657 (BLI) |
| **Fiber count** | 02 to 12 | |
| **Flammability rating** | OFN/OFNR* or LSZH | |

| Fiber count | Nominal outer diameter (mm) | Nominal weight (kg/km) | Maximum load during installation (kgf) | Minimum bending radius (mm) | |
|---|---|---|---|---|---|
| | | | | During installation | After installation |
| 2 | 4.8 | 19 | 185 | 15 x cable diameter | 10 x cable diameter |
| 4 | 5.2 | 21 | | | |
| 6 | 5.6 | 24 | | | |
| 8 | 6 | 34 | | | |
| 12 | 6.5 | 40 | | | |

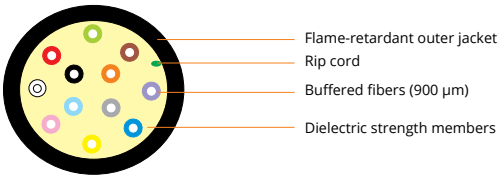
### Performance

In accordance to ET 1183

### Package

| | |
|---|---|
| Wood reel | |
| Cable length | 2100 m for Multimode fiber and 2000 m for Single-Mode fiber |

*Applicable to cables with PVC jacket and up to 12 fibers.




FIBER-LAN INDOOR/OUTDOOR 12F

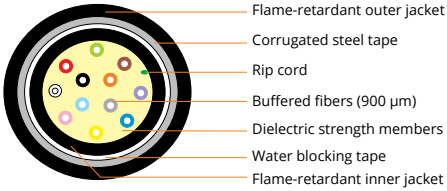
# OPTICAL CABLE FIBER-LAN-AR

| | |
|---|---|
| **Denomination** | CFOT-AREO |
| **Description** | Tight-buffered cable, composed by optical fibers with secondary coating (900 µm), surrounded by dielectric strength members and involved by an inner jacket. A corrugated steel tape protects against rodents and over this is applied a flame retardant outer jacket with UV protection. |
| **Application** | Installation environment: indoor/outdoor. |
| | Operation environment: in ducts or underground manhole susceptible to temporary inundation. Environment subject to rodents' action. |

## Construtive Characteristics

| | | |
|---|---|---|
| **Fiber types** | Multimode (50/125) | OM4, OM3 and OM2 |
| | Multimode (62.5/125) | OM1 |
| | Single-mode (9/125) | G.652.D |
| **Fiber count** | 02 to 12 | |
| **Protection against rodents** | Corrugated steel tape | |
| **Flammability rating** | OFN or LSZH | |

| Fiber count | Nominal outer diameter (mm) | Nominal weight (kg/km) | Maximum load during installation (kgf) | Minimum bending radius (mm) | |
|---|---|---|---|---|---|
| | | | | During installation | After installation |
| 2 to 6 fibers | 11.5 | 175 | 185 | 15 x cable outer diameter | 10 x cable outer diameter |
| 8 to 12 fibers | 12.5 | 185 | | | |




FIBER-LAN AR 12 FIBERS

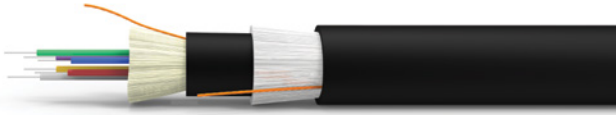
## Performance

In accordance to ET 1480

## Package

| | |
|---|---|
| Wood reel | |
| Cable length | 2100 m for Multimode fiber and 2000 m for Single-Mode fiber |

# OPTICAL CABLE FIBER-LAN-AR (PFV)

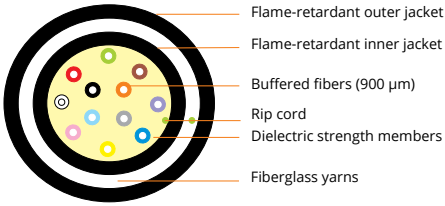


| | |
|---|---|
| **Denomination** | CFOT-EOR |
| **Description** | Tight-buffered cable, totally dielectric, composed by optical fibers with secondary coating (900µm), surrounded by dielectric strength members and involved by an inner jacket. A fiberglass layer protects against rodents and over this is applied a flame retardant outer jacket with UV protection. |
| **Application** | Installation environment: indoor/outdoor |
| | Operation environment: in ducts or underground manhole susceptible to temporary inundation. Environment subject to rodents' action. |

## Constrative Characteristics

| | | |
|---|---|---|
| **Fiber types** | Multimode (50/125) | OM4, OM3 and OM2 |
| | Multimode (62.5/125) | OM1 |
| | Single-mode (9/125) | G.652.D |
| **Fiber count** | 02 to12 | |
| **Protection against rodents** | Fiberglass yarns (PFV) | |
| **Flammability rating** | OFN or LSZH | |

| **Fiber count** | **Nominal outer diameter (mm)** | **Nominal weight (kg/km)** | **Maximum load during installation (kgf)** | **Minimum bending radius (mm)** | |
|---|---|---|---|---|---|
| | | | | **During installation** | **After installation** |
| 2 to 6 fibers | 11.8 | 195 | 185 | 15 x cable diameter | 10 x cable diameter |
| 8 to 12 fibers | 12.8 | 205 | | | |




FIBER-LAN AR (PFV) 12 FIBERS

## Performance

In accordance to ET 2206

## Package

| | |
|---|---|
| Wood reel | |
| Cable length | 2100 m for Multimode fiber and 2000 m for Single-Mode fiber |

# OPTICAL CABLE OPTIC-LAN

| | |
|---|---|
| **Denomination** | CFOT-UT |
| **Description** | Loose tube cable design, composed by a single tube (central) surrounded by dielectric strength members and covered by a flame retardant outer jacket with UV protection. |
| **Application** | Installation environment: indoor/outdoor. |
| | Operation environment: installed in ducts or underground manhole susceptible to temporary inundation. |

## Construtive Characteristics

| | | |
|---|---|---|
| **Fiber types** | Multimode (50/125) | OM4, OM3 and OM2 |
| | Multimode (62.5/125) | OM1 |
| | Single-mode (9/125) | G.652.D |
| **Flammability rating** | LSZH | |

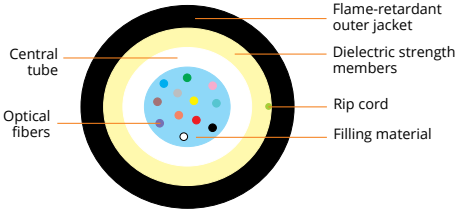
| Nominal outer diameter (mm) | Nominal weight (kg/km) | Maximum load during installation (kgf) | Minimum bending radius (mm) | |
|---|---|---|---|---|
| | | | During installation | After installation |
| 6.2 | 30 | 60 | 124 | 62 |

## Performance

In accordance to ET 2289

## Package

| | |
|---|---|
| Wood reel | |
| Cable length | 2100 m for Multimode fiber and 2000 m for Single-Mode fiber |




OPTIC-LAN 12 FIBERS

# OPTICAL CABLE OPTIC-LAN-AR (PFV)

| | |
|---|---|
| **Denomination** | CFOT-UTR |
| **Description** | Loose tube cable design, composed by a single tube (central) surrounded by dielectric strength members and involved by an inner jacket. A fiberglass layer protects against rodents and over this is applied a flame retardant outer jacket with UV protection. |
| **Application** | Installation environment: indoor/outdoor. |
| | Operation environment: installed in ducts or underground manhole susceptible to temporary inundation. Environment subject to rodents' action. |

## Construtive Characteristics

| | | |
|---|---|---|
| **Fiber types** | Multimode (50/125) | OM4, OM3 and OM2 |
| | Multimode (62.5/125) | OM1 |
| | Single-mode (9/125) | G.652.D |
| **Fiber count** | 02 to 12 | |
| **Protection against rodents** | Fiberglass yarns (PFV) | |
| **Flammability rating** | OFN or LSZH | |
| **Nominal outer diameter** | 12 mm | |
| **Nominal weight** | 170 kg/km | |

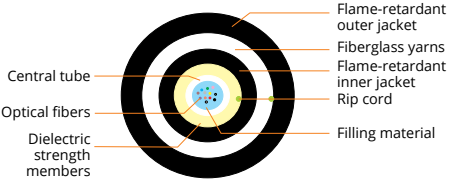
| Maximum installation load (kgf) | Minimum bending radius (mm) | |
|---|---|---|
| | During installation | After installation |
| 300 | 240 | 120 |

## Performance

In accordance to ET 2168

## Package

| | |
|---|---|
| Wood reel | |
| Cable length | 2100 m for Multimode fiber and 2000 m for Single-Mode fiber |




OPTIC-LAN AR (PFV) 12 FIBERS

# OPTICAL CABLE CFOT-UB

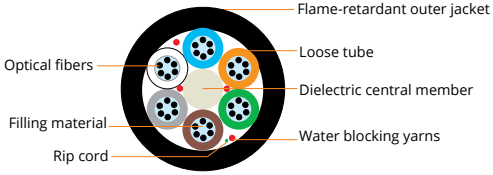
| | |
|---|---|
| **Denomination** | CFOT-UB |
| **Description** | Loose tube cable design, available with dry core or totally gel-free in which fibers are organized into multi-tubes arranged around a dielectric central member and covered by a flame retardant outer jacket with UV protection. |
| **Application** | Installation environment: indoor/outdoor. |
| | Operation environment: installed in ducts or aerial lashed in a steel messenger. |

## Construtive Characteristics

| | | |
|---|---|---|
| **Fiber types** | Multimode (50/125) | OM4, OM3 and OM2 |
| | Multimode (62.5/125) | OM1 |
| | Single-mode (9/125) | G.652.D |
| **Fiber count** | 02 to 144 | |
| **Core type** | Dry or totally gel-free | |
| **Flammability rating** | OFN or LSZH | |

| Cable type | Fiber count | Fiber count per basic unit (loose tube) | Dry Core | | | Totally Dry Core | | |
|---|---|---|---|---|---|---|---|---|
| | | | Nominal outer diameter (mm) | Nominal weight (kg/km) PVC | Nominal weight (kg/km) LSZH | Nominal outer diameter (mm) | Nominal weight (kg/km) PVC | Nominal weight (kg/km) LSZH |
| CFOT-UB | 06 to 36 | 6 | 9.2 | 87 | 80 | 9.2 | 82 | 75 |
| | 48 to 60 | 12 | 10.2 | 103 | 93 | 10.2 | 98 | 88 |
| | 72 | | 10.9 | 119 | 109 | 10.9 | 114 | 104 |
| | 96 | | 12.4 | 150 | 139 | 12.4 | 142 | 131 |
| | 120 | | 14.1 | 183 | 172 | 14.1 | 177 | 164 |
| | 144 | | 16 | 223 | 212 | 16 | 214 | 205 |

| Maximum load during installation (kgf) | Minimum bending radius (mm) | |
|---|---|---|
| | During installation | After installation |
| Up to 12F: 133 | 20 x cable diameter | 10 x cable diameter |
| More than 12F: 267 | | |




CFOT-UB 36 FIBERS

## Performance

In accordance to ET 1252 (dry core) and ET 3095 (totally gel-free)

## Package

| | |
|---|---|
| Wood reel | |
| Cable length | 2100 m for Multimode fiber and 2000 m for Single-Mode fiber |

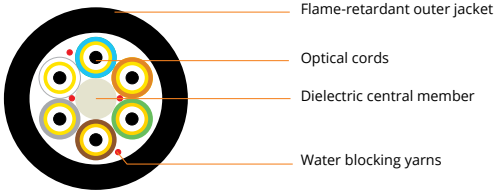
# TERMINATION OPTICAL CABLE MULTI CORDAGE

| | |
|---|---|
| **Denomination** | CFOT-MF |
| **Description** | Breakout cable composed by tight buffered optical cords arranged around a dielectric central member and covered by a flame retardant outer jacket with UV protection. |
| **Application** | Installation environment: indoor/outdoor. |
| | Operation environment: installed in ducts or underground manhole susceptible to temporary inundation. |

## Construtive Characteristics

| | | |
|---|---|---|
| **Fiber types** | Multimode (50/125) | OM4, OM3 and OM2 |
| | Multimode (62.5/125) | OM1 |
| | Single-mode (9/125) | G.652.D |
| **Fiber count** | 02 a 12 | |
| **Flammability rating** | OFN or LSZH | |

| Cable type | Fiber count | Nominal cable dimensional (mm) | Nominal weight (kg/km) PVC | Nominal weight (kg/km) LSZH | Maximum load during installation (kgf) | Minimum bending radius (mm) | |
|---|---|---|---|---|---|---|---|
| | | | | | | During installation | After installation |
| CFOT-MF | 02 | 10 | 94 | 87 | 133 | 20 x cable diameter | 10 x cable diameter |
| | 04 | 10 | 104 | 94 | | | |
| | 06 | 11.2 | 120 | 110 | | | |
| | 08 | 12.7 | 143 | 132 | | | |
| | 10 | 14.3 | 176 | 162 | | | |
| | 12 | 16.1 | 230 | 219 | | | |




CFOT-MF 6 FIBERS

## Performance

In accordance to ET 1252

## Package

| | |
|---|---|
| Wood reel | |
| Cable length | 2100 m for Multimode fiber and 2000 m for Single-Mode fiber |

# OPTICAL CABLE FIBER-LAN INDOOR

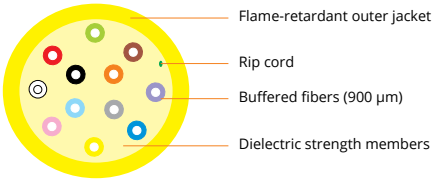
| | |
|---|---|
| **Denomination** | CFOI-EO |
| **Description** | Tight-buffered cable composed by optical fibers with secondary coating (900 µm), surrounded by dielectric strength members and covered by a flame retardant outer jacket. |
| **Application** | Installation environment: indoor |
| | Operation environment: intrabuilding backbone and horizontal application. |

## Constrative Characteristics

| | | |
|---|---|---|
| **Fiber types** | Multimode (50/125) | OM4, OM3 and OM2 |
| | Multimode (62.5/125) | OM1 |
| | Single-mode (9/125) | G.652.D and G.657 (BLI) |
| **Fiber count** | 02 to 72 | |
| **Flammability rating** | OFN, OFNR*, OFNP and LSZH | |

| **Fiber count** | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 24 | 36 | 48 | 72 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nominal outer diameter (mm)** | 4.8 | 5.2 | 5.6 | 6 | 6.3 | 6.5 | 14.4 | 14.4 | 17.5 | 16.5 | 20.5 |
| **Nominal weight (kg/km)** | 19 | 21 | 24 | 34 | 38 | 40 | 192 | 192 | 231 | 254 | 372 |
| **Maximum load during installation (kgf)** | Up to 12F: 66 | | | | | | | | | | |
| | More than 12F: 132 | | | | | | | | | | |
| **Minimum bending radius (mm)** | During installation | | | | 15 x cable diameter | | | | | | |
| | After installation | | | | 10 x cable diameter | | | | | | |

*Applicable to cables with PVC jacket and up to 12 fibers.




FIBER-LAN INDOOR 12 FIBERS

## Performance

In accordance to ET 2070

## Package

| | |
|---|---|
| Wood reel | |
| Cable length | 2100, 900 or 500 m |

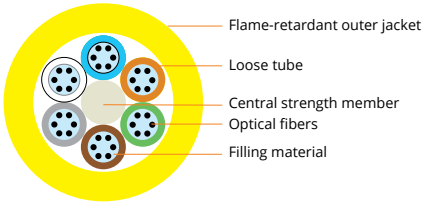
# INDOOR OPTICAL CABLE CFOI - UB

| | |
|---|---|
| **Denomination** | CFOI-UB |
| **Description** | Loose tube optical cable design, available with dry core and totally gel-free in which fibers are organized into multi-tubes and covered by a flame retardant outer jacket. |
| **Application** | Installation environment: indoor |
| | Operation environment: intrabuilding backbone and horizontal application. |

## Construtive Characteristics

| | | |
|---|---|---|
| **Fiber types** | Multimode (50/125) | OM4, OM3 and OM2 |
| | Multimode (62.5/125) | OM1 |
| | Single-mode (9/125) | G.652.D |
| **Fiber count** | 06 to 144 | |
| **Core type** | Dry and totally gel-free | |
| **Flammability rating** | OFN or LSZH | |

| | **Dry Core** | | | | | | **Totally Gel Free** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fiber count** | 06 to 36 | 48 to 60 | 72 | 96 | 120 | 144 | 06 to 36 | 48 to 60 | 72 | 96 | 120 | 144 |
| **Nominal outer diameter (mm)** | 9.2 | 10.2 | 10.9 | 12.4 | 14.1 | 16.0 | 9.2 | 10.2 | 10.9 | 12.4 | 14.1 | 16.0 |
| **Nominal weight (kg/km) - LSZH** | 87 | 103 | 119 | 150 | 185 | 223 | 86 | 101.6 | 117.6 | 148.6 | 183.6 | 221.6 |
| **Maximum load during installation (kgf)** | Up to 12F: 66 | | | | | | | | | | | |
| | More than12F: 132 | | | | | | | | | | | |
| **Minimum bending radius (mm)** | During installation | | | 15 x cable diameter | | | | | | | | |
| | After installation | | | 10 x cable diameter | | | | | | | | |




CFOI-UB 36 FIBERS

## Performance

In accordance to ET 1195 (dry core) and ET 2706 (totally gel-free).

## Package

| | |
|---|---|
| Wood reel | |
| Cable length | 2100 m for Multimode fiber and 2000 m for Single-Mode fiber |

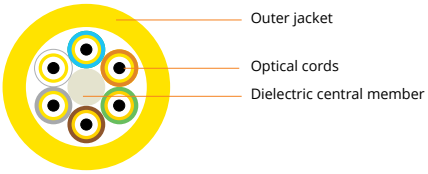
# INDOOR OPTICAL CABLE MULTI CORDAGE

| | |
|---|---|
| **Denomination** | CFOI-MF |
| **Description** | Breakout cable composed by tight-buffered optical cords arranged around a dielectric central member and covered by a flame retardant outer jacket. |
| **Application** | Installation environment: indoor |
| | Operation environment: interconnect in premise application. |

## Construtive Characteristics

| | | |
|---|---|---|
| **Fiber types** | Multimode (50/125) | OM4, OM3 and OM2 |
| | Multimode (62.5/125) | OM1 |
| | Single-mode (9/125) | G.652.D and G.652.D (BLI) |
| **Fiber count** | 02 to 12 | |
| **Flammability class** | OFN or LSZH | |

| **Optical fiber count** | 02 | 04 | 06 | 08 | 10 | 12 |
|---|---|---|---|---|---|---|
| **Nominal cable dimensional (mm)** | 9.5 | 9.5 | 10.7 | 12.2 | 13.8 | 15.6 |
| **Nominal weight (kg/km)** | 86 | 89 | 117 | 151 | 194 | 247 |
| **Maximum load during installation (kgf)** | Up to 12F: 66 | | | | | |
| | More than 12F: 132 | | | | | |
| **Minimum bending radius (mm)** | During installation | | | 15 x cable diameter | | |
| | After installation | | | 10 x cable diameter | | |




CFOI-MF 06 FIBERS

## Performance

In accordance with ET 1195

## Package

| | |
|---|---|
| Wood reel | |
| Cable length | 2100 m for Multimode fiber and 2000 m for Single-Mode fiber |

# CABLE DESIGNATION AND MEANING

**SELF-SUPPORTED AERIAL NETWORK**

**C F O A - X - ASY - W - Z - K - V**

- Special Feature
  - TS - Totally gel-free
- Jacket types
  - NR - Standard
  - RC - Flame retardant
- Fiber count
- G - Filled core, S - Dry core
- Maximum span - (80, 120 and 200m)
- RA – Subscriber network
  - AS - Self-supported
  - ASU - Self-supported in unique tube
- Fiber types:
  - MM - Multimode
  - SM - Single-mode
  - NZD - Non Zero Dispersion
- Acrylate fiber cladding
- Optical
- Fiber
- Cable

**SELF-SUPPORTED AERIAL NETWORK – LONG SPAN**

**C F O A - X - LV-AS-Y-W-Z-K - V**

- Special Feature
  - TS - Totally gel-free
- Jacket types
  - RT - Tracking resistant
  - NR - Standard
  - RC - Flame Retardant
- Fiber count
- G - Filled core, S - Dry core
- Maximum Operation Load (5, 10, 12.15 and 20kN)
- AS - Self-supported
- Long spans
- Fiber types:
  - MM - Multimode
  - SM - Single-mode
  - NZD - Non Zero Dispersion
- Acrylate fiber cladding
- Optical
- Fiber
- Cable

**UNDERGROUND IN DUCTOR LASHED AERIAL NETWORK AND DIRECTLY BURRIED NETWORK**

**C F O A - X - Y-W-Z (K) - V**

- Special Feature
  - TS - Totally gel-free
- Protection types:
  - PFV - Fiberglass protection
  - PPU - Pultruded element protection
- Fiber count
- G - Filled core, S - Dry core
- Cable Application:
  - DD - Dielectric for duct installation
  - DE - Dielectric for directly buried installation
  - DPE - Dielectric and protected for directly buried installation
  - ARD – Protected with corrugated steel armor, for duct installation
  - ARE - Protected with corrugated steel armor, for directly buried installation
  - DER - Dielectric and protected against rodents for directly buried installation
  - DDR - Dielectric and protected against rodents for duct installation
  - AREU - Unique tube and protected with corrugated steel armor, for directly buried installation
- Fiber types:
  - MM - Multimode
  - SM - Single-Mode
  - NZD - Non Zero Dispersion
- Acrylate fiber cladding
- Optical
- Fiber
- Cable

**TERMINATION NETWORK**

**C F OT - X - Y - Z - W - V**

- Special Feature: TS - Totally gel-free
- Cable Flammability Rating: OFN - Optical Fiber Nonconductive; OFNR - Optical Fiber Nonconductive Riser; OFNP - Optical Fiber Nonconductive Plenum; LSZH - Low Smoke and Zero Halogen
- Fiber count
- Core Formation: MF - Multi-cordage; EO - Optical Element (buffered fiber); EOR - Optical element (buffered fiber), dielectric and protected against rodents for duct installation; AREO - Optical element (Buffered fiber), protected with corrugated steel armor, for duct installation; UTR – Unique tube, dielectric and protected against rodents for duct installation; UB – Basic unit (loose tubes); UT – Basic unit in single tube (central)
- Fiber types: MM - Multimode; SM - Single-Mode; NZD - Non Zero Dispersion
- Termination
- Optical
- Fiber
- Cable

**INDOOR NETWORK**

**C F O I - X - Y - Z - W - V**

- Special Feature: TS - Totally gel-free
- Cable Flammability Rating: OFN - Optical Fiber Nonconductive; OFNR - Optical Fiber Nonconductive Riser; OFNP - Optical Fiber Nonconductive Plenum; LSZH - Low Smoke and Zero Halogen
- Fiber count
- Cable core: MF - Multi-cordage; EO - Optical Element (bufferd fibers); UB- Basic Unit (loose tubes); UT- Basic Unit in single tube (central); CM- Metallic Cable or CD- Dielectric Cable; For compact drop: (CA) Friction Class: (CO - Conventional, BA - Low Friction)
- Fiber types: MM - Multimode; SM - Single-Mode; NZD - Non Zero Dispersion
- Indoor
- Optics
- Fiber
- Cable

**INDOOR NETWORK (OPTICAL CORDS)**

**C O A - X - Y - Z - W**

- Cable Flamability Rating: OFN - Optical Fiber Nonconductive; OFNR - Optical Fiber Nonconductive Riser; OFNP - Optical Fiber Nonconductive Plenum; LSZH - Low Smoke and Zero Halogen
- Optical cord diameter: 12 - 1,2 mm, 16 - 1,6 mm, 18 - 1,8 mm, 20 - 2,0 mm, 25 - 2,5 mm, 29 - 2,9 mm
- Formation: MF - Simplex Cord; DP - Duplex Zip Cord; MTF - Multifiber Cord
- Fiber types: MM - Multimode; SM - Single-Mode; NZD - Non Zero Dispersion
- Acrylate fiber cladding
- Optic
- Cord

**ACCESS TO SUBSCRIBER NETWORK**

**C F O A C - X - Y - W - Z - K**

- Cable Flamability Rating: OFN - Optical Fiber Nonconductive; OFNR - Optical Fiber Nonconductive Riser; OFNP - Optical Fiber Nonconductive Plenum; LSZH - Low Smoke and Zero Halogen
- Fiber count
- Cable core: MF - Simplex; EO - Optical Elements; UT - Basic unit in unique tube; For compact drop: CM - Metallic cable; CD - Dielectric Cable; (CA) Friction Class: (CO - Conventional, AR - Low Friction)
- AS - Aerial Self-supported; ASU - Aerial Self-supported in Unique Tube
- Fiber types: MM - Multimode; SM - Single-Mode; NZD - Non Zero Dispersion
- Subscriber access
- Acrylate fiber cladding
- Optics
- Fiber
- Cable

# Research and Development

## Technology in constant evolution.

Furukawa has invested heavily in laboratories and research on broadband and networking applications, thus becoming a center of excellence capable of offering complete solutions, adapted to the most diverse needs in its field of specialty: telecommunication network infrastructure and information technology.

## Component Level Laboratory

This laboratory allows the execution of tests and analyses of products according to international standards. Among the advantages of having this structure, are the greater speed in the development of the products, efficiency in the improvement of processes and adjustments of cables and equipment.

## Testing Field

The real conditions of cable and accessory installation are reproduced in this environment. This makes it possible to ensure the efficiency of the technology and compliance with international standards before product is launched in the market.

# Socio-Environmental Responsibility

The socio-environmental policies practiced by Furukawa show its commitment with building an evolutionary and sustainable society. The recognition of this conduct came with achievements such as the Certificate of ISO 14001:2004 for Environmental Management granted by Underwriters Laboratories (UL) to the industrial unit.

Good examples are the waste management that contributes for products and raw materials recycling and the LSZH (Low Smoke Zero Halogen) or LSOH cables which contribute to the low emission of toxic gases and smoke.

## ISO 9001 Certification for Quality Management Systems

The ISO 9001 certificate Quality Management System is present at the industrial units of Brazil, Argentina and Colombia.

## OHSAS 18001 Certification

Occupational health and safety managment by DQS-UL, concerning safety and health of employees.

## ISO 14001 Certification and Environmental Certification Ecological Label – Green Seal

Another representation of Furukawa's commitment with environmental responsability is ISO 140001.

## RoHS Compliant

The European RoHS directive restricts the use of certain hazardous substances in electrical and electronic equipments and stimulates the reuse of products and determines a proper management, with the objective to improve the effectiveness of the environmental protection by reducing the amount of industrial waste and the risk of the components.

Furukawa stablished since 2007 the RoHS compliant requirement for the entire line of products of structured cabling.

# Quality

## Affiliation

Furukawa Electric has active participation in the major organizations and committees of the sector.

## Proven quality

Furukawa pays permanent attention on quality in all the stages of its production process. This concern ensured the company important Brazilian and international certificates.

## Extended warranty

Furukawa offers extended warranty of 15 to 25 years, which ensures the reliability of the materials used as well as the installation services of its authorized channels.

# Furukawa Institute of Technology

## Education as a front line

The objective of Furukawa Institute is to train partners and clients in the best practical use of Furukawa solutions in network infrastructure. It is a continuous education system that is divided into modules.

## FCP training program

Developed to prepare network installation professionals and create technical competence for the market, reducing the training time of teams. The scarcity of experienced professionals in the market makes the practical courses become a solution to reduce the training time.

Furukawa provides practical and theoretical courses in network infrastructure, which trains the professional in short period of time.

# **Furukawa specialization in technologies**
## Innovation and Trends

Besides the training courses provided by the Authorized Training Centers, specific trainings are offered for channels and clients, provided directly by Furukawa professionals.

Having the knowledge of new technologies help specialized professionals.

With people becoming more connected and the need for differential solutions and technologies infrastructure, we provide the markets with training that help them design networks for the future, such as Laserway and physical layer management.

FURUKAWA ELECTRIC

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