

Zone Cabling: Application and Product Guide >

Zone Cabling for Smart Buildings

With multiple devices requiring individual cabled connections, using traditional structured cabling for a Smart Building can be very costly and time-consuming to implement.

In addition, Smart Building technology is evolving rapidly and the range of PoE-enabled devices available is increasing all the time. PoE devices are often inexpensive and relatively easy to implement and install.

Zone cabling is ideal for supporting converged networks with a mix of data and voice, wireless device uplink connections, and a wide range of sensors and other PoE devices. The flexibility of zone cabling enables Smart Building users to easily update or reconfigure their implementation to meet changing requirements, without being locked into a rigid network design.



Optimizing Building Performance

A Smart Building is one that uses technology to share information between systems about what goes on in the building, with the objective of optimizing the building's performance. This information is then used to automate various processes, from heating and ventilation, to air conditioning and lighting.

The most fundamental feature of a Smart Building is that the core systems within it are linked, and each of these systems has the ability to talk to one another.

Sensors

Smart Buildings generate large volumes of valuable data about their own use - something that regular

buildings simply don't do. Data is essential to be able to make informed decisions about where to allocate resources. For example, footfall counters may be integrated into the system to provide information on which areas have high traffic at different times of day. Light sensors inform decisions about window shading and control of ceiling lights.

Sensors are therefore an essential part of all Smart Buildings.

Automation

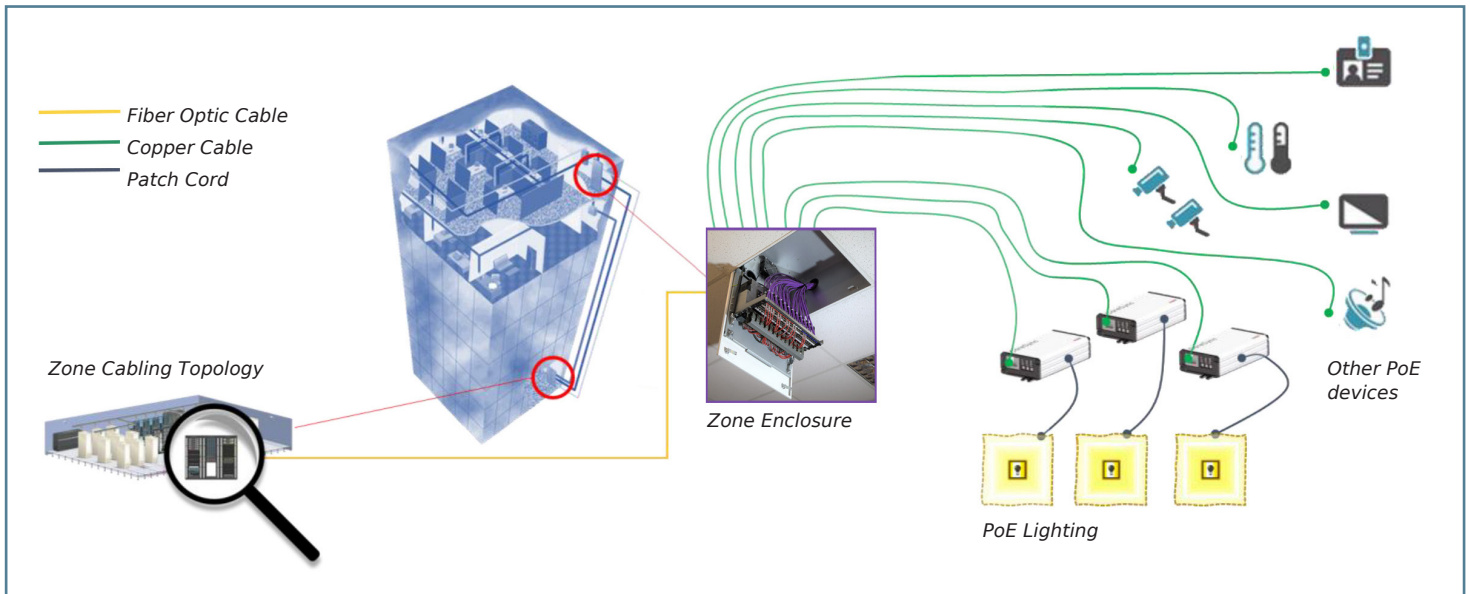
This data is collated and analyzed by the Smart Building systems. Importantly, this is done constantly and in real time. This ongoing monitoring allows for automated control that can instantaneously adjust conditions locally or across an entire building.

Power over Ethernet

Smart Building functionality is enabled by IP Convergence - the ability for multiple types of traffic to be carried over a single network. IP Convergence in turn is enabled by Power over Ethernet (PoE), which eliminates the need for separate power cabling for many devices and sensors. For example, individual PoE-powered LED lighting fixtures can be powered and controlled via the same cable. Other systems that can be migrated to PoE include meeting room management, audio-visual equipment, powered window shades and emergency notifications.

Moving to an orchestrated IP-based infrastructure creates value for building developers and landlords as well as the tenant businesses.

Zone Cabling Infrastructure: Flexibility to Adapt >



As businesses and working practices evolve and requirements shift, spaces need to be able to adapt quickly with a minimum of disruption to ongoing operations.

Traditional structured cabling can mean many long cable runs from the Telecommunications Room (TR) to each work area that are difficult and expensive to reconfigure.

By rethinking network cabling organizations are able to integrate multiple services, maximizing flexibility and achieving cost savings both in the short and long term. These services include (but are not limited to): BAS (Building Automation Systems), Smart Lighting, Data and Voice networks, Wireless (Wi-Fi), Energy Management, visual information display and digital signage, sensors and actuators, HVAC controls, and more.

Zone Cabling Architecture

A zone cabling architecture involves a pre-planned connection point in the horizontal cable so that copper or fiber runs are routed from the TR to Zone Enclosures (ZEs) which then support

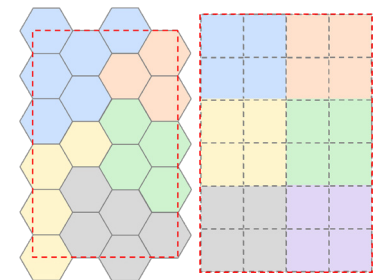
specific work areas or zones via a raised/access floor or ceiling. Shorter copper or fiber lengths then run from the Zone Enclosure to each work area in that zone.

A zone cabling infrastructure optimizes space, provides floor level MACs (Moves-Adds-Changes) and enables easier location, management and maintenance of the network cabling system. Zoned spaces reduce material and labor costs on installation, and when reconfiguring space: in one calculated example zone cabling required 53.7% less cabling and a 51.3% reduction in man-hours compared to conventional cabling*.

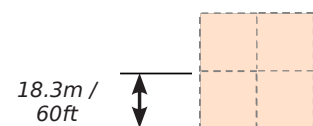
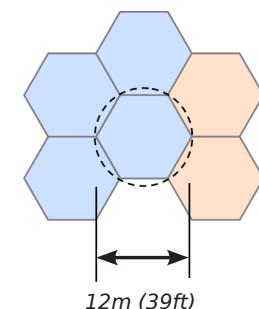
Zone cabling also provide advantages to commercial property owners and occupiers by minimizing disruption to ongoing operations and by maximizing asset utilization.

Designing for Zone Cabling

Zone cabling is governed by recognized international standards ANSI/TIA-862-B:2016 and ISO/IEC 11801-6:2017 for the design approach to support convergence of services.



Examples of zone area patterns



ANSI/TSB 162-A specifies square cells no larger than 18.3m (60ft), while ISO/IEC TR 24704 requires hexagonal cells no more than 12m (39ft) radius.

Each coverage area is serviced by at least one device (generally a WAP (Wireless Access Point), IP camera, etc), although multiple devices can share a coverage area. Different patterns may be used for coverage areas.

Each Zone Enclosure is conveniently located in the ceiling or under the floor, with their associated grouping of coverage areas providing maximum flexibility for MACs.

A zone area should range from 72m² to 720m² (775sq ft to 7750 sq ft) to support a device coverage area radius of 3 to 30m (32 to 323ft). Each coverage area may have multiple Service Outlets (SOs), Telecommunications Outlets (TOs) and direct connections from Service Connection Points (SCPs) to building devices.

ISO/IEC 22801-6, ANSI/TIA-862-B and TIA TSB-162-A provide detailed guidance for grid coverage area distribution patterns.

Controlling Heat Build-Up

When planning for PoE applications, heat management is essential. ANSI/TIA-184-A states that thermal dissipation can be improved by selecting cables with metallic elements, such as a shield or a screen. Without a shield or a screen heat can only be dissipated by air, which is poor conductor for heat.

Shielded Category 6A cables support improved heat dissipation, which is particularly vital for higher power PoE applications.

Zone Cabling for Wireless Networks

Wireless is now ubiquitous and essential for network access in offices, hospitals, schools, universities and outdoor areas, to name a few. Zone cabling is particularly suited for the support of

wireless coverage areas.

To ensure support of fifth-generation WiFi (IEEE 802.11ac), a device coverage area or a cell size should be no greater than 13m or 42ft. Zone Enclosures should be conveniently located within their associated grouping of coverage areas, thus ensuring that the signal is reliably spread, eliminating gaps in transmission between coverage areas.

International cabling standards for Wireless Access Points and Smart Buildings recommend that a Category 6A system is deployed.

Fiber optic cable can also be installed to connect Wireless Access Points (WAPs) and other IP devices where longer distances are required.

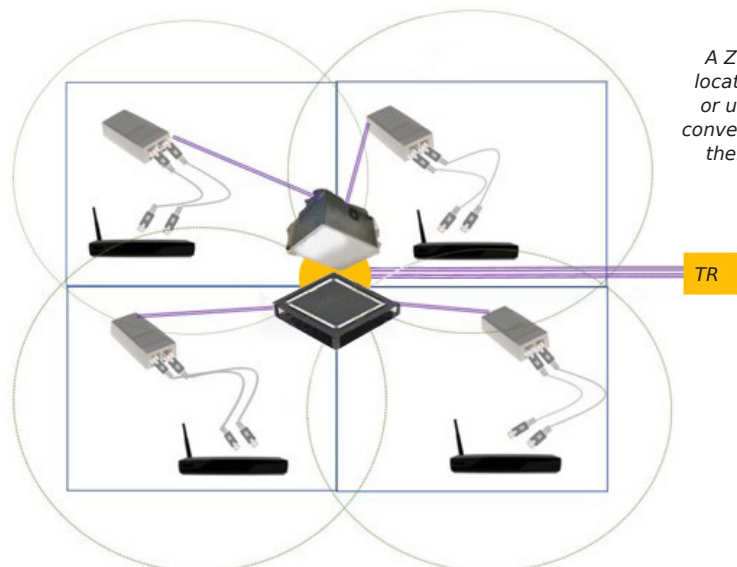
Reducing Costs, Minimizing Disruption

Moves-Adds-Changes to a cabling infrastructure can be highly disruptive, particularly in high footfall areas and in schools, universities and healthcare facilities. By installing a Zone Enclosure in a

suspended ceiling or under the floor to connect specific areas, the scale of these changes and the inevitable disruption can be minimized. The need to close off whole floors and essential transit routes can be substantially reduced or even eliminated.

By integrating all services into a Zone Cabling architecture designed for the support of PoE devices, the ongoing cost of operations can be reduced.

**See [Safe And Easy Ways For Smart Buildings To Implement Zone Cabling Architectures](#) for details (login required)*



A Zone Enclosure is located in the ceiling or under the floor to conveniently intersect their coverage area groups

Molex Zone Cabling Solutions

ZONE ENCLOSURES

In-Ceiling Zone Enclosure

- Designed specifically for 600mm x 600mm or 2ft x 2ft drop/suspended ceiling grid installations
- The product accommodates up to 48 copper ports or up to 96 fiber splices or MTP/MPO fibers and active equipment
- Cost-effective, robust, and versatile
- Manufactured from Aluzinc with a steel network platform. The access door is finished in white powder coat
- Lockable for network equipment security
- Hydraulic, slow-release dampers fitted to each side of pull-down network equipment platform provides safe and easy access to the connectivity
- The network equipment platform includes 19" equipment mounting rails, allowing 5U of capacity including an integral cable management plate for the support of incoming and outgoing cable bundles.
- Multiple cable entry knockouts facilitate convenient cable entry and exit routes
- Accepts the Molex PowerCat range of copper patch panels and fiber optic enclosure products
- Labor saving Molex factory pre-terminated copper and fiber cable assemblies can be deployed to minimize downtime



Raised/Access Floor Zone Enclosure

- Designed specifically for 600mm x 600mm or 2ft x 2ft raised/access floor grid installations
- Cost-effective, robust, and versatile
- Manufactured from strong cold-rolled steel, finished in black
- Interchangeable mounting plates for copper or fiber installation options
- Supports up to 24 Molex DataGate Jacks or 24 fiber adapters (48 fibers) or 4 ModLink MTP/MPO 12 or 24 fiber cassettes.
- Chassis features cable-tie anchor points for the correct routing and securing of cable and sufficient capacity to accommodate a 24 fiber splice and pigtail management tray
- Compatible with Molex snap-in 12 fiber DLC or DSC adapter plates
- Top access cover plate features protected label holders that allow clear port identification when viewed from above the raised/access floor recess.



POWERCAT 6A SOLUTION

Designed to support 10 Gigabit Ethernet (10GBase-T), Category 6A is an optimum speed structured cabling solution offering superior performance where speed, reliability, future proofing or long term tenancy is required, and has become the system of choice for PoE applications where heat management is important. Shielded Category 6A cables support improved heat dissipation when deploying PoE devices in business, education or healthcare operations.

- 360° shielded connection with the die-cast shielded DataGate connector
- Protection - the unique spring loaded DataGate connector shutter not only protects against dust, contaminants and unwanted ingress, but also ejects improperly seated or damaged patch cords
- Reliability - cable management features help reduce stress on cables and maintain consistent performance
- Excellent performance - end-to-end shielded solution for the support of Category 6A Systems

Category 6A Field Termination Plug

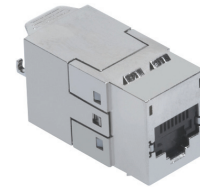
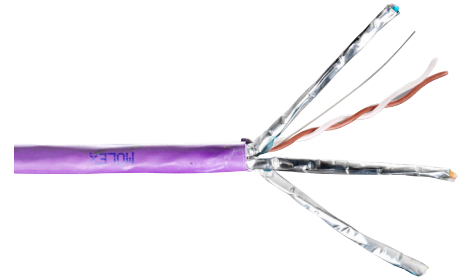
The Molex Category 6A field termination plug allows convenient field terminations to the cable length required for Modular Plug Terminated Link (MPTL) connections. It is ideal for the installation of WAP and other IP enabled devices.

- Designed to accommodate conductors from 22 AWG - 26 AWG
- TIA-568-C.2 Category 6A component performance
- UL listed
- Termination capability:
 - Solid wire: 22-26 AWG
 - Stranded wire: 22-27 AWG

Surface Mount Boxes

Synergy Copper Surface Blocks are perfect for use in a confined space and where surface mount is the only option. The product is often deployed for PoE device connections. Available in 1, 2, 4 and 6 port versions.

- Utilize DataGate C5e UTP, Cat 6 UTP, Cat 6A shielded copper jacks and single-position copper modules
- Contemporary styling
- Rear loading modules to reduce tampering
- Slotted screw holes for easy alignment and removal
- Protected labeling for port identification



Outdoor Category 6A Shielded Connectivity Solution

Outdoor rated connectivity products protect the connection between the outdoor wireless access point or security camera and the existing network cabling infrastructure from climatic conditions.

Euromod IP66 2 Port RJ45 Enclosure Unloaded

The Euromod IP66 2 Port RJ45 Enclosure protects Euromod DataGate Jack terminations from impact damage, dust and pressured jets of water.

The product features a fixed gasket around the rear backbox/ mounting box and a further gel seal and gasket enclosing the RJ 45 jacks and patch cord connections under the hinged cover, ensuring robust protection against the outdoor environment.

The product is designed to house the RJ45 jacks needed for the connection of outdoor WAP or security camera devices to the network. The enclosure accepts two Euromod 25 x 50mm Molex DataGate modules, supplied separately.



Outdoor Category 6A Shielded Patch Cord

Molex Category 6A patch cords are designed to support high-speed 10GBASE-T networks and are backward compatible with 10 / 100 / 1000BASE-T networks.

Manufactured from high quality four pair 26AWG stranded copper wire, each pair is shielded in aluminum/mylar foil and enclosed in a LS0H sheath.

The cable is terminated with Molex high performance Category 6A shielded RJ45 plugs. This high performance assembly is enclosed in a UV stabilized, flexible polyamide covering, protecting the patch cord against mechanical shock, water and dust ingress and capable of withstanding an operating temperature of -20°C to +60°C or -4°F to 140°F.



LIGHTBAND FIBER SOLUTIONS

Fiber Cable

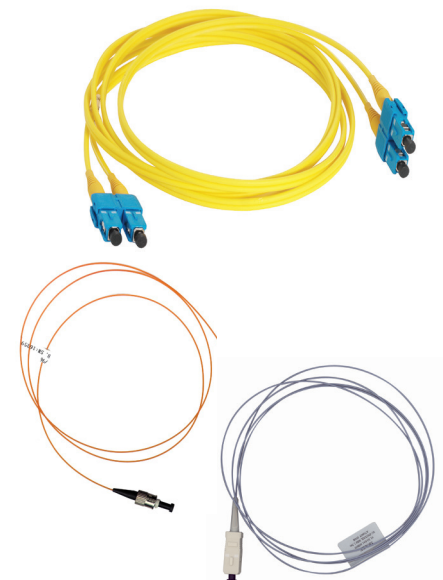
Molex Lightband backbone cabling is designed for performance and engineered to last. This range of indoor, outdoor, plenum and riser cables delivers the bandwidth to support your business as it grows.

Patch Cords & Pigtails

Our comprehensive range of fiber optic patch cords and pigtails deliver ruggedized cable construction and insertion loss better than 0.30dB.

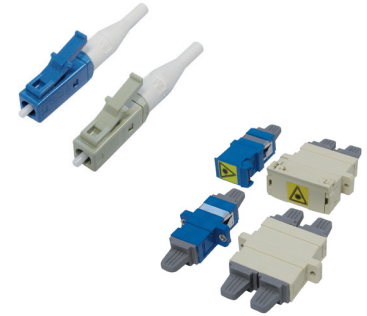
Advanced manufacturing processes provide exceptional performance, and Molex maintains strict control over ferrule endface surfaces to ensure high performance and long-term reliability of all terminations.

Customized lengths can be ordered for both patch cords and pigtails.



Connectors

Molex Lightband connectors are available in both Multimode and Singlemode variants. Designed to the highest performance specifications, meeting international standards and providing low insertion loss.



Adapters

Molex's robust, high-quality Singlemode and Multimode adapters are designed to be installed with no tooling required. Designed for a variety of applications. Available in shuttered and unshuttered versions.

1U Multi-Function Fiber Enclosure

This configurable rack mount unit is designed to accommodate a variety of termination types and adapter configurations. The interchangeable front plate facilitates upgrades as required, while the drawer allows maximum flexibility for routing fibers. An extensive range of accessories and adapter plates is available.



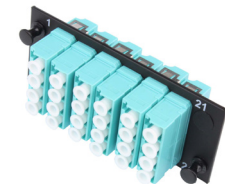
Specification Grade Fiber Optic Enclosure 1U

The enclosure is a configurable rack mount unit for storing and terminating incoming fiber cable. The enclosures are designed to accommodate both the needs of the installer for the initial assembly and the end user for access, maintenance and fiber protection. The design maintains stable optical integrity throughout the life and use of the enclosure.



Adapter Plates

Molex makes it easy to field configure its fiber optic enclosures with an extensive line of adapter plates. The 6-PAK plates are loaded with high quality adapters and require no tools - the plates install with a simple snap rivet, making installation and/or changes simple. Lightband adapter plates are available for the support of 6, 12 or 24 fibers or for high-density MPO/MTP.



MORE INFORMATION

Product order numbers and full specifications:

www.molexces.com/products

Molex Power over Ethernet Solution:

www.molexces.com/solutions-overview/poe

Smart Buildings with Molex CoreSync

www.molexces.com/solutions-overview/smart-buildings

Safe And Easy Ways For Smart Buildings To Implement Zone Cabling Architectures

Download the white paper or watch the webinar here (login required): csp.molex.com/pages/lecture_series

www.molexces.com/solutions-overview/zone-cabling/