



INTELLIGENT BUILDING INFRASTRUCTURE SOLUTIONS

- CommScope® offers Intelligent Building Infrastructure Solutions that provide a robust common infrastructure and convergence for all of a building's systems.





Intelligent Buildings: Leveraging Technology Trends to Benefit Building Owners/Operators and Tenants



Building owners/operators and tenants demand tremendous value and performance from their facilities. Buildings must provide cost-effective, productive, safe and flexible working environments. Building owners/operators require operational efficiencies that generate cost savings, while tenants want enhanced services that mean autonomy, comfort and higher productivity.

Fortunately, there are a number of technology advances and industry trends that are making it possible for today's buildings to answer these challenges:

- Migration to IP-enabled devices and IP networks
- Growing convergence of enterprise networks
- Focus on interconnecting facilities and accessing real-time data
- Increased usage of wireless technologies
- Renewed attention on environmental and energy efficiency

CommScope recognizes that the convergence of these events can result in Intelligent Buildings offering real benefits because of the way they allow building systems to integrate and communicate.

Many of a building's ongoing costs relate to the low voltage systems that provide and sustain the building's functionality. The reality is that 75% of a building's lifetime cost will come in the form of ongoing maintenance and operating expenses. Since the average life of a building is 30-40 years, these costs for that lifetime can be staggering. So any innovation that simultaneously

reduces cost over time, while also enhancing building performance, holds substantial appeal. Intelligent Buildings offer such innovation.

Simply put, Intelligent Buildings harness technology and link building systems in order to supply more efficiency, higher productivity and increased comfort.

This brochure highlights these benefits in greater detail and provides guidance on the deployment of Intelligent Building applications on a single, common infrastructure. CommScope offers a range of solutions to meet the unique needs of Intelligent Buildings—from copper to fiber optic to coax solutions—and illustrative examples of these solutions are outlined within this brochure. For assistance in designing a solution to fit your specific needs, please contact your local CommScope representative.

CommScope: Providing Infrastructure Solutions for Intelligent Buildings

CommScope has been a major player in the Intelligent Building infrastructure market since its beginning, dating back to the mid 1980s, providing solutions to connect a building's many low voltage systems for maximum performance. Most buildings feature between 10 to 46 low voltage systems, each requiring its own control, management and monitoring over the decades of a building's lifetime.

Without a common infrastructure that can link them together, these dozens of systems can create a lifetime accumulation of unnecessary cost and commotion. But with a single backbone supporting all of these systems—from security to lighting, from HVAC to communications—building operations can become high performance and cost-effective.

The global trend among innovative buildings is toward a comprehensive infrastructure solution that CommScope calls **Intelligent Building Infrastructure Solutions—or IBIS**.

With Intelligent Building Infrastructure Solutions—or IBIS—all of a building's systems, from Building Automation Systems and Communications Systems, to video surveillance and access control, are converged over the same, common infrastructure, providing an enhanced level of efficiency and cross-system performance.

Intelligent Buildings—and their requisite infrastructures—are quickly becoming the new standard for owners/operators and tenants who want high-performing, easily-managed, efficient spaces.

The Benefits of Intelligent Buildings

Benefits to Building Owners/Operators

Intelligent Building benefits for building owners/operators typically fall into two areas: operational efficiencies and opportunities for increased revenues.

Operational Efficiencies

- Intelligent systems lead to reduced costs through energy efficiency
- Lower operating staff costs (maintenance, facilities and security) and improved staff productivity
- Single interface for integrated building services and ability to control multiple buildings centrally
- Extend the lifecycle of a building
- Reduce capital expenditures and operating expenditures over the lifecycle of a building
- Better data for maintaining and operating a building
- More effectively provide comfortable environments for all tenants

Revenue Opportunities

- Increased rents derived from enhanced building features and functionality such as:
 - High-speed Internet
 - IP telephony and unified communications
 - Network and physical security
 - Tenant control over office environment
- Improved occupant satisfaction leading to higher retention rates
- Higher resale value

Benefits to Tenants

Intelligent Buildings lead to tenant benefits in two key categories: comfortable working environments and enhanced services for efficiency and effectiveness.

Working Environment

- Improved air quality
- Self-managed temperature
- On-demand lighting
- Higher security in parking areas, elevators, common areas and offices
- Control over human resource elements via one interface, including telephone, voicemail, building and parking access, network access, etc.

Enhanced Productivity

- Voice, video and data communication infrastructure pre-installed, including:
 - Telephone, voicemail, intercoms
 - Video and audio conferencing
 - LAN and WAN, e-mail, Internet access
 - Remote access
- Ability to reconfigure office space quickly, easily, cost-efficiently and independent of the building owner/operator
- Consistent comfort of employees allows for increases in overall worker productivity





CommScope Intelligent Building Infrastructure Solutions

The Power of Convergence

In most commercial buildings, each facility operation such as HVAC, fire detection systems, security, lighting and energy coexist independently from one another. In an Intelligent Building, these systems are fully integrated and communicate centrally. For example, in a traditional building scenario, a smoke detector system will sound an alarm in the presence of smoke. In an Intelligent Building, the fire control subsystem will also communicate with the HVAC system, automatically closing air vents, and will signal the security subsystem to unlock all doors so tenants may exit. These capabilities are made possible through linking or integrating Building Automation Systems (BAS).

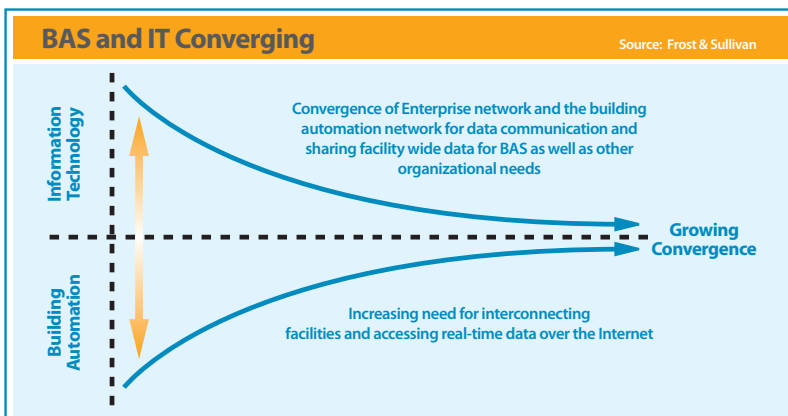
A common infrastructure makes this scenario possible, but it also takes it one step further by linking all BAS with the Communications Systems of a building. By linking tenant voice and data communications and BAS on the same common infrastructure, an IBIS implementation enables an efficient, streamlined management platform, giving tenants the benefit of an enhanced, high-performing environment.

This is the power of convergence. An increasing number of building systems are already migrating to IP-based communications to allow the benefits of real-time data. Bringing all of these systems onto a common wired infrastructure brings cost benefits from day one, by consolidating the number of contractors needed to wire a building, shortening time schedules and reducing conflicts between system suppliers. As tenants are offered the potential for higher-performing spaces, the cost benefit potential increases substantially. And since IBIS also supports a higher degree of intelligence by interconnecting systems, operating expenses are reduced over the lifetime of the building through simpler, cost-effective maintenance.

The Power of Intelligence

When dozens of low voltage systems are installed under a common wiring infrastructure, a host of enhancements opens up to owners/operators and tenants. The practical benefits are countless and allow discerning tenants to lease high-performing spaces that also maximize cost efficiencies for building owners/operators.

- IBIS from CommScope provides a single infrastructure for the multitude of a building's systems, making operations simple and cost-effective.
- 24/7 monitoring informs owners of the need to replace equipment or parts while simultaneously contacting and scheduling maintenance, eliminating costly downtime and discomfort.
- Tenants gain customized control over their spaces, adjusting their physical environment to suit their business needs while preserving predetermined owner standards for building efficiency.



- After-hours and emergency situations become far more manageable with interconnected systems that conserve energy, minimize damage and facilitate evacuations.
- Tenant moves, adds and changes (MACs) become simple and straightforward since systems and tenant-related functions are linked under a common infrastructure.
- Ultimately, tenants are offered enhanced, customized building features while owners/operators profit from cost savings from the time a building is designed and constructed, throughout its lifetime.

Design Considerations for Successfully Integrating Building Systems

1. Understand tenants' businesses.
2. Get early participation in the process among all involved in building design and construction as well as system's design and installation.
3. Set realistic expectations among all parties.
4. Clearly define the roles of "traditional" project designers involved in the project.
5. Detail the scope and clearly identify the systems involved.
6. Establish the technical foundations and operational functions of the systems in order to guide their design.
7. Bridge any gaps between persons involved in facility management, life safety and information technology.
8. Obtain regularly-updated cost estimates throughout the project.

9. Understand and adhere to the overall project schedule and its sequencing of activities.
10. Diligently manage the system's installation and operation.

IBIS and Industry Standards

Until the mid-1990s, most building automation systems were proprietary and did not interoperate with multiple vendor platforms. A consortium of building management companies, system users and manufacturers worked to change the industry to an open environment. Their effort led to two key industry standard protocols—BACnet and LonWorks.

BACnet (or Building Automation and Control Networks Protocol) was developed by the American Society of Heating, Refrigeration and Air-Conditioned Engineers (ASHRAE). It is the oldest and most widely-used open protocol standard for Intelligent Building Systems.

LonWorks was developed by Echelon Corporation and requires a proprietary neuron chip in the controllers that connects individual devices to the overall system.

In 2002, the industry's standards bodies developed guidelines for structured cabling infrastructure to support intelligent buildings. ANSI/TIA/EIA-862 lays out the BAS Cabling Standard for commercial buildings.

CommScope has always supported industry standards for Intelligent Buildings, and IBIS allows developers and owners/operators to harness countless benefits while following the above guidelines.



IBIS: Several Applications, One Infrastructure



CCTV

As the world becomes more complex, so too do threats to business assets. Although the industry trend is the migration to IP-enabled cameras, many customers have a significant investment in legacy coax connected analog cameras. To protect their investment, video baluns and video servers are interim steps customers can implement prior to a system-wide change to IP video cameras.



IP Video Surveillance

New digital IP cameras connected to the corporate IP network enable electronic monitoring anywhere in the world, making IP video surveillance a simple and effective tool. When combined with video analytics, businesses can be proactive in their surveillance, monitoring and preventing "tailgating" (when more than one employee enters the building with only one employee card swipe). And as wide surveillance coverage is needed, cameras can simply be plugged in at any available RJ45 outlet, making IP video surveillance very scalable.



Alarms & Sensors

Alarms and sensors are analogs to the human body's five senses, detecting what is happening in an environment and reporting that information to a controller that can take action. Connecting sensors and alarms like thermostats and emergency exit doors to an IP-enabled controller allows both everyday and emergency situations to become enhanced with multi-system response.



Access

Today's access is worlds beyond the traditional, lock-and-key, but many workplaces demand even tighter access control. IP-linked access enables control systems like card readers and biometrics, but it also provides enhanced benefits like lighting and HVAC activation to conserve energy, and central building messaging upon entry, in case of emergency evacuation.



HVAC

Keeping building temperature in a comfortable range is difficult, and enterprises have learned that giving HVAC control to employees or tenants does not work due to over-compensation. New IP-enabled HVAC systems tie into servers with sophisticated software, allowing monetary penalties if tenants exceed agreed-upon levels as well as providing for future weather forecasting that enables adjustments in advance.





Communications

Voice, video and data systems are always evolving, as business communications adopt a standards-based, globally-accepted structured connectivity solution. Today, solutions are available for voice, data and video in both wired and wireless enterprise networks.



Energy

Enterprises have an ongoing struggle to control growing energy usage. But IP-enabled HVAC systems allow usage to be determined by tenant access, with tight degree-change ranges set by advance agreement with tenants to eliminate energy waste.



Fire

Since it involves critical life or death situations, fire and life safety must be able to function at a moment's notice. Bringing these building functions under IP control can allow cross-system enhancements like HVAC shut-off, access unlock, emergency exit lighting, and customized warning enunciations that specify the floor where fire has been detected.



Elevators

Elevators in high-rise buildings are becoming highly connected, with telephones, cellular phone coverage, flat panel TVs, and surveillance cameras. The interconnection of these various systems enhances the tenant experience, improves safety and communication, while also offering the possibility of video advertising or announcements.



24/7 Monitoring

With all of a building's systems interconnected using a common infrastructure, even monitoring is enhanced. For instance, 24/7 monitoring can allow an AC system to message the central monitoring software regarding a bad bearing. Since the message includes a model number and building location, a new part can be ordered and installed before the old part fails, with maintenance notified and scheduled when a shutdown will least affect a building's tenants.



Lighting

The struggle to control energy usage is a never-ending battle for businesses. Installing smart IP-interconnected systems can control energy usage by turning lights off in an office when an employee steps out. Automated systems can also control building lights after hours without the need to call a property management company.

CommScope: Infrastructure Solutions for Every Application



CommScope brings decades of experience to the world of Intelligent Building design. Our solutions allow owners/operators and tenants to reap the true benefits of Intelligent Buildings by linking every system within a common infrastructure. No matter the application, CommScope provides the infrastructure solutions that an intelligent building needs.

For more information on any solution or application, visit www.commscope.com to consult our solutions literature and IBIS Flash tool. Or, contact your local CommScope representative.

Access



Solutions

SYSTIMAX® GigaSPEED® XL Solution – Horizontal
SYSTIMAX LazrSPEED® Solution – Backbone (IP-based)*

Benefits

- Improve disaster preparedness through secure access measures.
- Prevent internal sabotage that might threaten business operations.
- Lower operating expenses, fewer security personnel required.

*For some legacy applications, additional coupling loss may have to be taken into consideration.

Alarms & Sensors



Solutions

SYSTIMAX GigaSPEED XL Solution – Horizontal
SYSTIMAX LazrSPEED Solution – Backbone (IP-based)*

Benefits

- Monitor and maintain environmental systems for lower operating costs.
- Enhance sensitivity of fire suppression systems for critical data networking equipment.
- Improve security for research areas through sophisticated biometric sensing.

CCTV



Solutions

CommScope Coax Solution
SYSTIMAX GigaSPEED XL Solution – Horizontal
SYSTIMAX LazrSPEED Solution – Backbone (IP-based)*

Benefits

- Provide timely external communications content and company focused news.
- Enhance employee effectiveness through in-house training programs.
- Monitor store rooms and inventories against theft or shrinkage.

Communications



Solutions

SYSTIMAX GigaSPEED X10D Solution – Horizontal
 SYSTIMAX LazrSPEED Solution – Backbone (IP-based)*
 SYSTIMAX TeraSPEED Solution – Backbone/Campus

Benefits

- Improve business operations with a more reliable, faster network.
- Reduce downtime and increase productivity.
- Generate improved profitability through increased productivity.

Elevators



Solutions

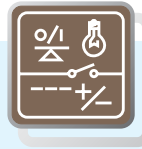
SYSTIMAX GigaSPEED XL Solution – Horizontal
 SYSTIMAX LazrSPEED Solution – Backbone (IP-based)*

Benefits

- Minimize breakdowns through ongoing monitoring.
- Improve security and tenant protection.
- Improve communication through on-board, flat screen technology.

*For some legacy applications, additional coupling loss may have to be taken into consideration.

Energy



Solutions

SYSTIMAX GigaSPEED XL Solution – Horizontal
 SYSTIMAX LazrSPEED Solution – Backbone (IP-based)*

Benefits

- Lower operating expenses through environmental monitoring of basic building utilities.
- Ensure minimal network and critical systems downtime through automated redundant power.
- Create a more comfortable and productive working environment.

Fire



Solutions

SYSTIMAX GigaSPEED XL Solution – Horizontal
 SYSTIMAX LazrSPEED Solution – Backbone (IP-based)*

Benefits

- Locate and contain the source of fire rapidly.
- Reduce time to locate missing personnel and facilitate access control.
- Enable rapid response capabilities for evacuation.
- IP interconnection to 1st responders.
- Allow lower cost for insurance coverage.

*Consult your Commscope sales rep when selecting this cabling.





HVAC



Solutions

SYSTIMAX GigaSPEED XL Solution – Horizontal
SYSTIMAX LazrSPEED Solution – Backbone (IP-based)*

Benefits

- Generate significant cost savings through peak load monitoring and balancing.
- Improve employee environment and productivity.
- Increase equipment longevity and lower operational costs through proper cooling in data center spaces.

IP Video Surveillance



Solutions

SYSTIMAX GigaSPEED XL Solution – Horizontal
SYSTIMAX LazrSPEED Solution – Backbone (IP-based)*

Benefits

- Protect personnel, property and content.
- Improve security against device tampering or errors during MACs.
- Enhance evacuation procedures for better employee exit.

Lighting



Solutions

SYSTIMAX GigaSPEED XL Solution – Horizontal
SYSTIMAX LazrSPEED Solution – Backbone (IP-based)*

Benefits

- Conserve energy and reduce carbon emissions.
- Gain a greater return on investment through usage monitoring.
- Increase tenant satisfaction through a more productive workspace.

24/7 Monitoring



Solutions

SYSTIMAX GigaSPEED XL Solution – Horizontal
SYSTIMAX LazrSPEED Solution – Backbone (IP-based)*

Benefits

- Integrate disparate systems.
- Allow data sharing and analysis capabilities.
- Improve operational efficiency and productivity.

*For some legacy applications, additional coupling loss may have to be taken into consideration.

CommScope Intelligent Building Infrastructure Solutions address the requirements of these innovative environments.

These solutions include:

SYSTIMAX GigaSPEED X10D Solution

Category 6A UTP/FTP Copper

- Designed for 10GBASE-T connectivity
- True Cat 6A/Class E_A (500 MHz) performance
- Modal Decomposition Modeling verified performance qualified to worst case 6:1 configuration

SYSTIMAX GigaSPEED XL Solution

Category 6 UTP Copper

- Unequaled performance across 250 MHz frequency range
- Industry-leading design flexibility
- Guaranteed 6 dB margin over Cat 6/Class E standard

SYSTIMAX LazrSPEED Solution

Laser Optimized 50µm Fiber

- HR-DMD certified highest bandwidth multimode fiber available
- Flexible and scalable fiber solution
- Low loss, high density connectivity

SYSTIMAX TeraSPEED Solution

Zero Water Peak Single-mode Fiber

- Designed for optimum performance from 1280 nm through 1625 nm
- Flexible and scalable fiber solution
- Low loss, high density connectivity

CommScope Coax Solution

For those customers wishing to protect a significant investment in analog cameras

- Meet or exceed safety standards (NEC & CEC)
- CommFlex jacketing – superior performance and handling characteristics
- Extensive product line to choose from





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