

# THE ARTIFICIAL BARRIERS BETWEEN YOU AND AN IP-ENABLED BUILDING AUTOMATION SYSTEM

How the right approach enables resiliency, security, and cost efficiency



Building operators want to use IP-based technologies within their building automation systems (BAS) to better manage energy, enhance the occupant experience, and reduce costs.

## WHAT'S STOPPING THEM?

**Common misconceptions about IP-based solutions create artificial barriers to adopting them. As a result, many industry professionals assume it's not the right approach for their buildings.**

### MISCONCEPTION

*"There's too much risk of downtime."*

Reliability is everything. If there's a break in network communication, it becomes difficult to detect potential equipment failures. Building operators want to have confidence that a single fault in the chain won't cause larger issues.

### MISCONCEPTION

*"There are too many security risks."*

Implementing IP-connected devices and systems creates potential areas of attack or infiltration for cybercriminals and other unwanted visitors if improperly implemented and managed. It's critical to keep both the building and the data safe.

### MISCONCEPTION

*"My current systems are likely to be disrupted or face ongoing issues as I connect them to the IP network."*

Building automation systems can require complex implementations that impact many areas of a building. Building operators are concerned that undertaking a deep-reaching implementation project could impact building conditions for occupants during implementation, or cause long-lasting issues. When they need to add additional infrastructure, it can be costly and frustrating.

### MISCONCEPTION

*"It costs too much."*

A poorly implemented IP-based solution can add significant costs to a design.

Wiring is a critical consideration: running cables throughout large buildings is costly and time-consuming, especially if the wrong topology is used. BAS solutions built on a network topology that is not optimized for the building, or using inferior protocols, inflate costs and necessitate extra hardware purchases.

### MISCONCEPTION

*"My team doesn't have IT expertise or resources."*

Often, organizations assume they don't have the IT resources to implement and support an IP-enabled BAS. With a considerable number of connections, many believe that building automation systems require more IP addresses than their staff and infrastructure can support.

# But many building operators are using IP-based BAS solutions to achieve **GREAT RESULTS.**

## **GAIN USEFUL INFORMATION AND SOLVE PROBLEMS FASTER**

When key building systems are connected via IP networking, you gain real-time information about what's going on. Combined with visualization, this information can help you proactively prevent issues and quickly solve problems.

## **REDUCE ENERGY COSTS AND MEET REGULATIONS**

Detailed information on what's happening in your building can help you make decisions that reduce energy costs. By lowering your power consumption, you can also meet recent government mandates.

## **INCREASE PROPERTY VALUE**

The enhanced occupant satisfaction and optimized building performance ultimately increase your property's value.

## **ENSURE A SECURE NETWORK FOR THE SMART BUILDINGS OF THE FUTURE**

Securing connected IP networks helps protect building operations and data while preventing against malicious activity.

## **INCREASE OCCUPANT SATISFACTION AND RETENTION**

Real-time control makes building environments more comfortable and secure for occupants—from automated smart lights to climate control and physical security.

Addressing concerns with IP-based systems starts at the beginning.

# NETWORK TOPOLOGY.

Network topology options for building management networks and how they compare



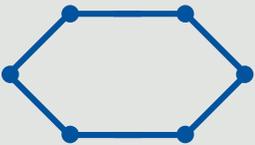
## TOO EXPENSIVE: STAR

Star topology connects all endpoints through a single hub, but requires the most wiring, and the highest number of ports/network switches. That makes it too expensive for many budgets.



## HIGHEST RISK: DAISY CHAIN

Daisy chain configuration links IP network devices in a linear fashion. If a link goes down, everything downstream does too. This setup reduces wiring and network port needs, but it also offers the least network resiliency.



## THE WINNER: RING

Ring topology offers the best of both worlds. Every device on the network is connected to two devices. Data flows from device to device in a circular pattern. The last device is connected to the first. It's less expensive and less labor-intensive to install than a star configuration. It requires less wiring, too.

## WITH RING, THE OPPORTUNITIES GO FULL CIRCLE

Building owners, designers, and operators can benefit:



Increase system resiliency and security



Reduce costs



Enhance the occupant experience

However, ring topology alone is not enough.

**THE RIGHT TECHNOLOGY**  
COMBINED WITH THE  
**RIGHT TOPOLOGY** IS WHAT  
MAKES IP-ENABLED BAS  
RELIABLE AND AFFORDABLE.

# Johnson Controls and Cisco have created an INDUSTRY-LEADING MRP RING-ENABLED IP CONTROLLER SOLUTION.

Johnson Controls and Cisco provide a comprehensive, easy-to-implement IP controller solution that fully leverages each company's expertise and unlocks the full value of an IP-based BAS without the downsides.

The solution combines Johnson Controls IP equipment controllers with Cisco Industrial Ethernet switching technologies and the Media Redundancy Protocol (MRP) for ring topologies. All enabled by flexible, user-friendly configuration tools.

The new Johnson Controls MRP ring-enabled IP controller solution, connected by Cisco technology, delivers an enhanced, connected occupant experience through the convergence of IT network and building automation technologies.



## Johnson Controls IP Controllers

Support increased network performance, to enable faster access to data and faster troubleshooting.



## Cisco Industrial Ethernet 2000 Switches

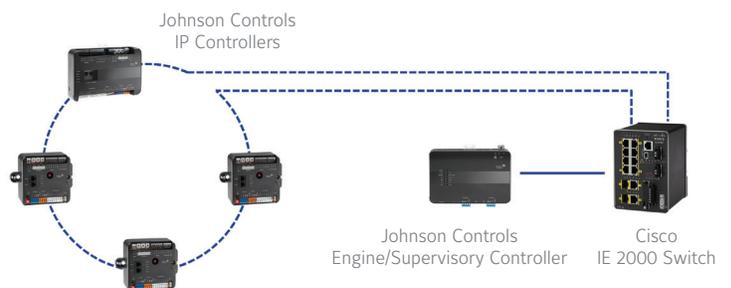
Connect all IP controllers and the Johnson Controls engine/supervisory controller via a ring-topology network.

## It's the only Media Redundancy Protocol (MRP)-enabled BAS solution

This network protocol for ring topologies enables networks to rapidly overcome failures and support more devices per ring.

## BENEFITS

- **Deliver system and network performance reliability:** Provide unparalleled resiliency, scalability, and security for critical systems with a highly available BAS
- **Reduce network costs:** Minimize implementation and maintenance costs with a simplified and streamlined network solution
- **Simplify operations and implementation:** User-friendly tools help your team accomplish more, and adding capacity is easy



Johnson Controls MRP ring-enabled IP controller solution, connected by Cisco technology, enables you to overcome your barriers to implementation.

#### MISCONCEPTION

*"There's too much risk of downtime."*

#### REALITY

Ring topology offers a single-fault-tolerant redundant path, ensuring operations aren't impacted even if one link in the chain goes down. It's more reliable than daisy chain topology. And since the Johnson Controls IP controller solution uses Media Redundancy Protocol, recovery and failover times are shorter.

Johnson Controls and Cisco combine ruggedized technologies with resilient networking to prevent issues and ensure rapid recovery in the event of a failure. Real-time alerting helps you react instantly to any network issues.

#### COMPETITORS

(Rapid Spanning Tree Protocol)

Recovery times between seconds and minutes

#### Johnson Controls solution

(Media Redundancy Protocol)

Millisecond recovery from failure

#### MISCONCEPTION

*"My current systems are likely to be disrupted or face ongoing issues as I connect them to the IP network."*

#### REALITY

Deploying IP networking and integrating the building functions can be done in phases with minimal impact and risk to ongoing operations. Enhancing the existing networks can be performed using IP solutions that are easily expandable in the future.

#### MISCONCEPTION

*"My team doesn't have IT expertise or resources."*

#### REALITY

Enabling tools such as the Johnson Controls IP Network Wizard significantly reduce the complexity and time to configure the switch. MRP-enabled ring topology requires less ports and cabling than star-topology implementations, thereby creating less of a demand on IT. And Cisco switches employ a user-friendly interface that many IT professionals are already familiar with.

#### MISCONCEPTION

*"There are too many security risks."*

#### REALITY

The partnership between Johnson Controls and Cisco, a leader in IT cybersecurity, has focused on security since the beginning. The joint IP-enabled solution provides the latest, most effective tools for preventing intruder access to your network.

The approach aligns with existing IT requirements around networking best practices and implementations. Comprehensive network monitoring gives you a total view of your IT infrastructure and IP-enabled devices in real time.

#### MISCONCEPTION

*"It costs too much."*

#### REALITY

Ring topology is inherently more affordable than star topology, and you don't have to compromise network resiliency to get it. Compared to other ring-topology offerings, the Johnson Controls and Cisco solution is the only one that supports Media Redundancy Protocol—which supports far more controllers per ring and switch. This reduces hardware and cabling costs.

Automated configuration tools and procedures provide a fast and standardized implementation that can be performed by BAS technicians to help control installation costs and minimize overhead. The Johnson Controls solution can be implemented in hours, not days.

#### Competitors

(Rapid Spanning Tree Protocol)

Up to 40 controllers per ring

#### Johnson Controls solution

(Media Redundancy Protocol)

Up to 100 controllers per ring

An IP-enabled BAS is more obtainable than many assume.

Johnson Controls and Cisco make it possible with a **reliable**, **resilient**, and **cost-efficient** ring-topology solutions.

We're ready to help you overcome your challenges, implement an IP-based solution, and enable a standout experience for your commercial environments.

*Let's get started.*

Contact your **Johnson Controls** representative.



**Johnson  
Controls**



**CISCO**  
Partner

### About Johnson Controls

Johnson Controls is a global diversified technology and multi-industrial leader serving a wide range of customers in more than 150 countries. Our 120,000 employees create intelligent buildings, efficient energy solutions, integrated infrastructure and next generation transportation systems that work seamlessly together to deliver on the promise of smart cities and communities. Our commitment to sustainability dates back to our roots in 1885, with the invention of the first electric room thermostat. We are committed to helping our customers win and creating greater value for all of our stakeholders through strategic focus on our buildings and energy growth platforms. For additional information, please visit <http://www.johnsoncontrols.com> or follow us @johnsoncontrols on Twitter.

### About Johnson Controls Building Technologies & Solutions

Johnson Controls Building Technologies & Solutions is making the world safer, smarter and more sustainable—one building at a time. Our technology portfolio integrates every aspect of a building—whether security systems, energy management, fire protection or HVACR—to ensure that we exceed customer expectations at all times. We operate in more than 150 countries through our unmatched network of branches and distribution channels, helping building owners, operators, engineers and contractors enhance the full lifecycle of any facility. Our arsenal of brands includes some of the most trusted names in the industry, such as Tyco®, YORK®, Metasys®, Ruskin®, Titus®, Frick®, PENN®, Sabroe®, Simplex® and Grinnell®. For more information, visit [www.johnsoncontrols.com](http://www.johnsoncontrols.com) or follow @JCI\_Buildings on Twitter.

### About Cisco

Cisco is the worldwide technology leader that has been making the Internet work since 1984. Our people, products, and partners help society securely connect and seize tomorrow's digital opportunity today. Discover more at [newsroom.cisco.com](http://newsroom.cisco.com) and follow us on Twitter at @Cisco.

Cisco helps seize the opportunities of tomorrow by proving that amazing things can happen when you connect the unconnected. An integral part of our DNA is creating long-lasting customer partnerships, working together to identify our customers' needs and provide solutions that fuel their success.

We have preserved this keen focus on solving business challenges since our founding in 1984. Len Bosack and wife Sandy Lerner, both working for Stanford University, wanted to email each other from their respective offices, but technological shortcomings did not allow such communication. A technology had to be invented to deal with disparate local area protocols, and as a result of solving their challenge, the multiprotocol router was born.