

Time for smarter networking

PlantStruxure Ethernet architectures



Schneider
Electric



Plug into the benefits of PlantStruxure™, Ethernet architectures:

- Visualize your entire process and energy usage
- Achieve higher operation uptime
- Enhance integrity of vital process information

“Ethernet, being an open and standard network, can provide a consistent technology across disparate applications requiring high capacity. This it can do vertically – from device level upwards – and horizontally to deliver plantwide / sitewide scalability.”

Frost & Sullivan

Build a network that increases energy efficiency

PlantStruxure Ethernet architectures open a world of new opportunities for your business



Ethernet connects all levels of your enterprise, from plant floor to board room

Your plant's productivity depends on how quickly your team can access and respond to vital process information. Operators need to be able to view and monitor key process parameters from any location on-site. Production managers need access to real-time information to make balanced and timely decisions. Maintenance team requires tools to quickly discover the root cause and reduce downtime.

To help you and your staff get maximum insight into the process, Schneider Electric offers a range of networking solutions and architectures based on the modern standard of industrial Ethernet. This high-capacity, open networking technology connects all the domains of your enterprise, from plant floor through control room to the board room, enabling production optimization and enhanced energy management.

Open networking supports your energy goals

Industrial networking solutions from Schneider Electric put Ethernet at the core of your system.

You can benefit from a fast network that offers a high degree of data protection, true interoperability, easy upgrades, simplified training, and many tools for faster troubleshooting and data analysis.

In order to manage your energy consumption, you have to be able to see it first. Collecting usage data is only possible through a fast, enterprise-wide network infrastructure, and this is where the modern capabilities of Ethernet come in.

PlantStruxure Ethernet architectures are built on best-in-class products and lifecycle services, and constitute the key building block of the EcoStruxure™ architecture, a comprehensive energy management system from Schneider Electric.

EcoStruxure architecture from Schneider Electric integrates the five key domains of your enterprise: Power, Process & Machine, IT Room, Building, and Security. It acts as a solution ecosystem to deliver optimization through energy management tools, compatible product design, and open platform software. This integrated approach allows you to manage your total business performance, and increase your energy efficiency by up to 30%.

Get on the path to production optimization

A modern standard that responds to your business needs

As a robust technology, Ethernet provides the bandwidth for seamless data flow from field devices to the top decision-making systems, integrating your key process domains. Ethernet networks are scalable, meaning they can be adjusted to the evolving requirements of your plant, while protecting previous investment in hardware and software.

PlantStruxure Ethernet architectures from Schneider Electric implement standard versions of the industrial Ethernet protocols: EtherNet/IP and Modbus TCP, owned and licensed by independent organizations

(ODVA and Modbus respectively). These multi-vendor organizations support the continuous development and standardization of the protocols.

Standardization means that devices will work together, regardless of origin, simplifying network design, equipment support, and training. In the long term, it also protects your investment, the technology will remain alive and viable as your operation grows and changes.



Schneider Electric is a founding member of Modbus and a principal member of ODVA

10 values of PlantStruxure Ethernet architectures:

Standard	Complete architectures based on standard Ethernet
Open	Integrate fieldbuses and third party devices
Flexible	Expanded architecture options with Ethernet RIO and dual ring switches
Efficient	A single network for regular and deterministic traffic without performance degradation
Transparent	Configure, operate and monitor devices from anywhere in the network
Sustainable	Easily upgrade legacy systems with the latest generation of Ethernet devices
Performing	Deterministic network performance for the operations that require it
Robust	Provide levels of protection from unauthorized access using industrial grade firewall
Easy-to-use	Pre-configured components simplify deployment of RIO architectures
Available	Redundant architectures for every level of Ethernet network

Multiple benefits for your plant network:

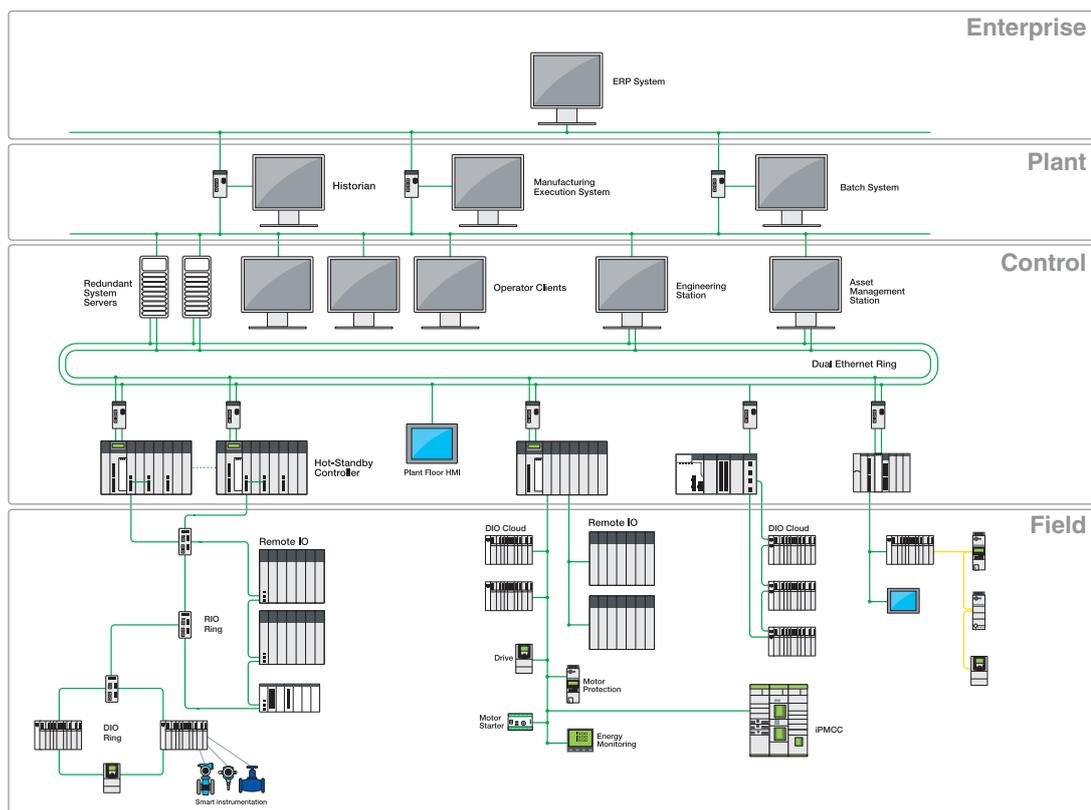
- A complete range of products, architectures, and services to help you run an energy-optimized enterprise
- Global device interoperability that makes it easier to design your network, regardless of protocol or vendor
- Protected investment through a standard technology that is easier to upgrade as your system develops
- High-capacity technology offering industrial-grade robustness and performance

Measure and manage your energy with PlantStruxure architectures

Ethernet is the backbone of PlantStruxure™ system from Schneider Electric, a collaborative and integrated architecture for process automation, built on best-in-class products and lifecycle services. Its primary goal is to help you optimize your energy consumption by delivering a clear picture of how energy is spent in your process.

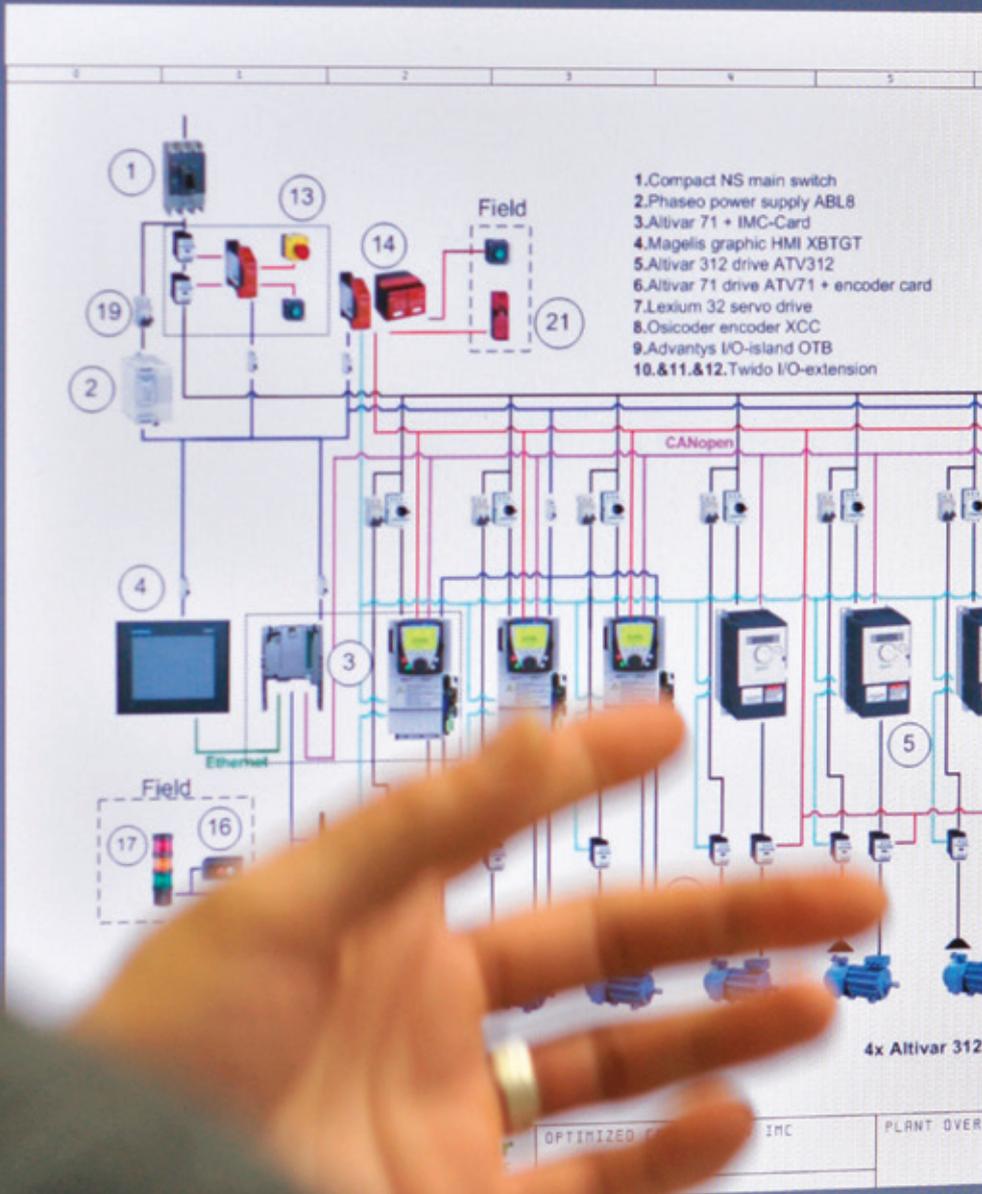
Through Ethernet-based open networking, PlantStruxure system transparently connects field, process and enterprise levels within your business, thus providing efficient sharing and distribution of information between sensors, instrumentation, devices, controllers, operator

work stations, and other third party systems. This enables you to move beyond production optimization, to reliably collect, manage and leverage process and energy data, and drive effective energy management.



To further support your energy efficiency goals, Schneider Electric provides a complete suite of lifecycle energy services. These include a comprehensive energy audit, root cause analysis, fine-tuning of underlying

network architecture, design of energy management information and optimization systems at enterprise-level, as well as continuous improvement consulting services.



Schneider Electric
Cabinet wiring diagram
080TL_C TESTLO
Preferred Architecture
Convey Optimiz CANop

Improve your network efficiency

Seamless data transfer with our Ethernet solutions

The ability of Ethernet to meet the requirements of intensive plant control applications hinges on two aspects – performance and flexibility. Schneider Electric's Modicon Quantum Ethernet Remote I/O solution excels in both areas.

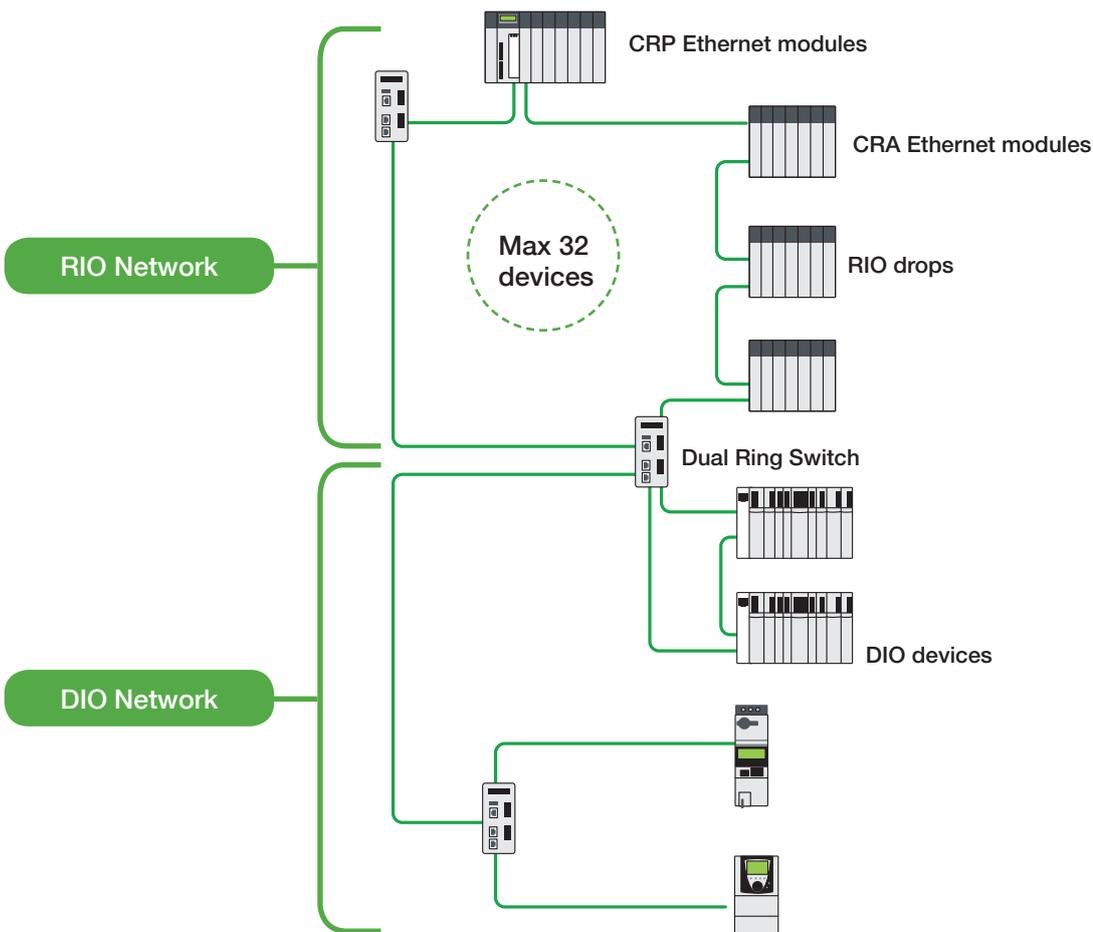
The Ethernet Remote I/O architecture is designed to provide a predictable and consistent transmission time for mission-critical communications, processing other traffic without degradation in I/O efficiency.

Even in the presence of other traffic, RIO traffic will remain consistent and repeatable.

The combination of different forms of traffic with consistency and repeatability, translates to a reduction in the overall cost of ownership of the system. At the same time, the network remains open and flexible to meet the changing business needs of the production system.



Ethernet Remote I/O can process other traffic without loss of efficiency



Consistent, predictable, competitive performance



SCADA/HMI and DIO traffic do not affect efficiency



Self-healing rings for sustainability

“The demand for an uninterrupted 24/7 public service means system availability is critical. Schneider Electric’s automation solution provides a high level of availability and the Ethernet network allows for the access of operational or diagnostic information from any location at any time, using standard web browsers.” — Christian Callegari, Managing Director, Fritzens WWTP

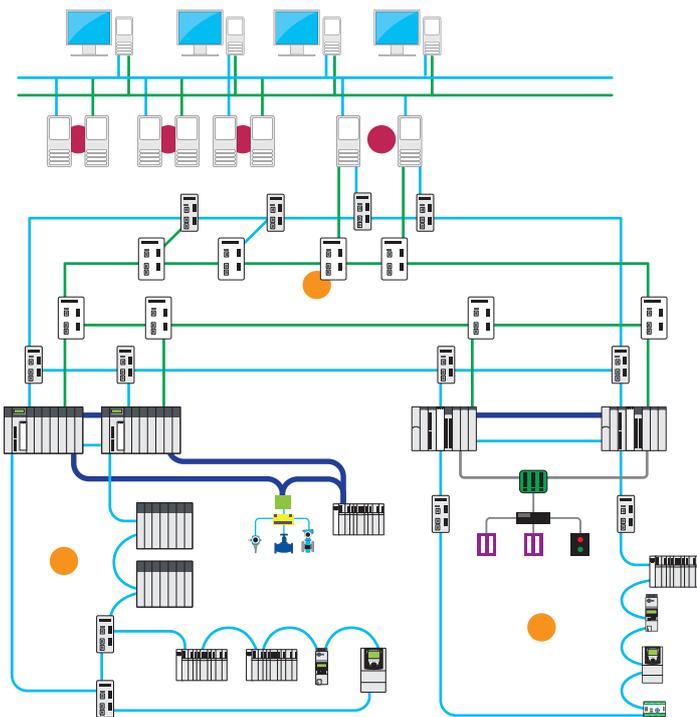


Make your process available 24/7

Reduce the risk of production downtime by embedding a high availability configuration

At Schneider Electric, we are dedicated to providing you with an industrial network with a very high level of availability. Implementing a high availability configuration allows you to minimize unplanned process stoppage, maintain your productivity, and improve your ability to execute energy savings.

A high availability system allows the plant to continue running, and notifies operators of an issue. The issue can then be rectified and the system brought back to redundant operation as quickly as possible.



- Redundant system server and operator clients
- Redundant networks for control and IO
- Redundant hot standby controllers



Improve integrity of your process data and network uptime



Reduce unplanned system stoppage



Instant notification of events



Availability and visibility at all levels



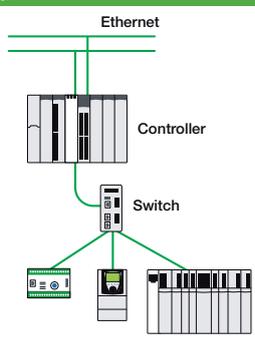
Choose the topology best suited to your installation

Design your network in alignment with your application needs

How you plan and design the layout of your network can make the difference when it comes to optimizing your system. The flexibility of Ethernet allows you to design and

build the topology of your network according to your specific needs. PlantStruxure Ethernet architectures from Schneider Electric provide a choice of options:

Star

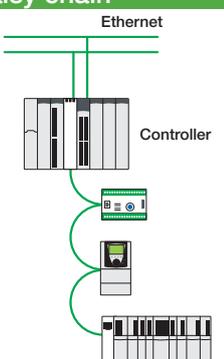


The diagram shows an Ethernet network connected to a central Controller. A Switch is connected to the Controller, and several devices (including a laptop and a server rack) are connected to the Switch in a star configuration.

Choose for:

- High performance and reliability
- Simplicity over high availability

Daisy chain

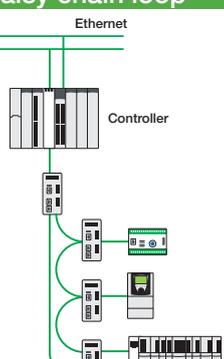


The diagram shows an Ethernet network connected to a Controller. A single device is connected to the Controller, and another device is connected to that device, forming a simple chain.

Choose for:

- Cost and simplicity over high availability and performance

Daisy chain loop



The diagram shows an Ethernet network connected to a Controller. A chain of devices is connected to the Controller, with the last device in the chain also connected back to the Controller, forming a loop.

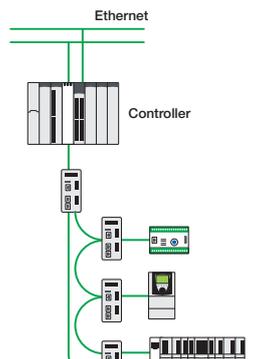
Choose for:

- Cost and simplicity over performance
- Increased availability with RSTP



5 of the many different network topologies at your disposal: star, daisy chain, daisy chain loop, ring, and WiFi.

Ring

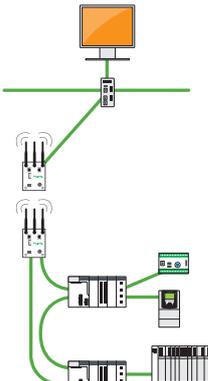


The diagram shows an Ethernet network connected to a Controller. A ring of devices is connected to the Controller, with each device connected to its neighbors in a circular fashion.

Choose for:

- High availability network with RSTP or HIPER-Ring

Wi-Fi



The diagram shows a Wi-Fi network connected to a Controller. A central access point is connected to the Controller, and several devices (including a laptop and a server rack) are connected to the access point wirelessly.

Choose for:

- Cost-efficiency for hard-to-reach or mobile devices
- More versatility of configuration



Distributed I/O and devices on the same network



Devices available from anywhere on the network



Reduced installation cost through daisy-chaining of devices



Develop your network while protecting legacy investment

PlantStruxure Ethernet architectures allows your network to evolve without unnecessary expenditure

While Ethernet is the modern technology of choice, a typical process automation project will involve other industrial networks as well. PlantStruxure Ethernet architectures, our solutions for industrial Ethernet implementation, can leverage your previous investment by providing broad connectivity and transparency to other fieldbuses.

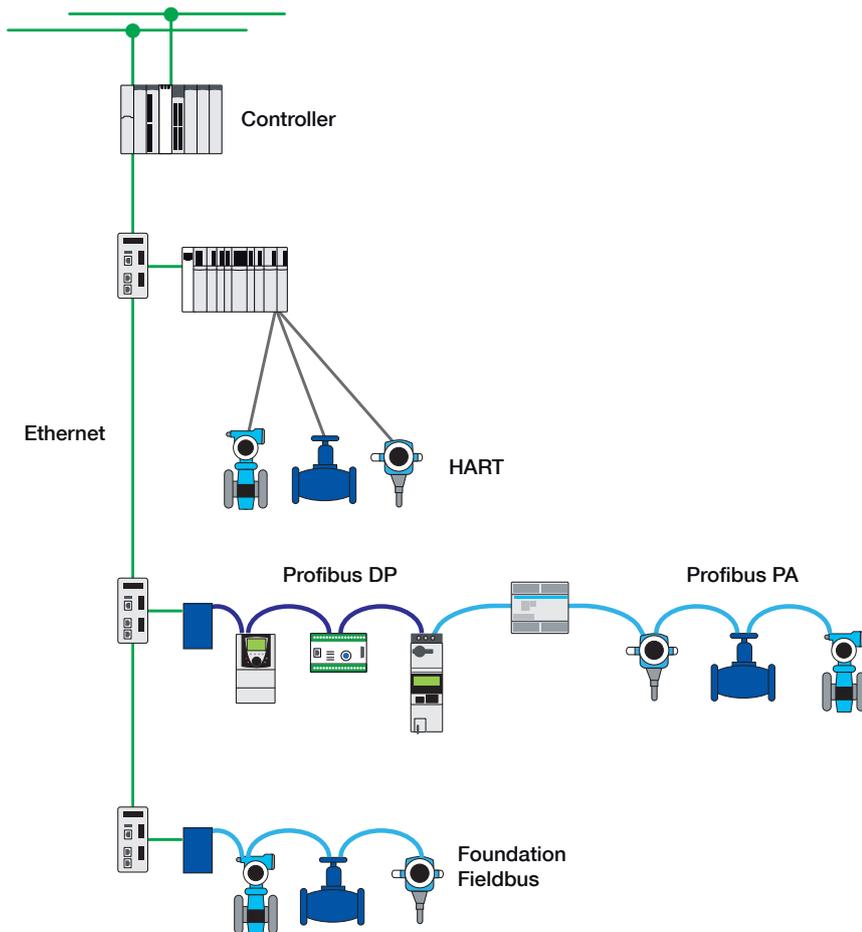
Through interfaces equipped to handle other fieldbuses, you can reach every device and instrument in the system from anywhere on the Ethernet network.

The transparency of Ethernet enables you to consolidate data from all devices seamlessly and efficiently.

Thus, evolving your operations with a PlantStruxure Ethernet architecture does not mean losing your established equipment. The ability to provide connectivity to various legacy networks will protect your investment well into the future.



Our Ethernet architectures give you more visibility into your legacy devices



Preserve your investment in existing equipment



Monitor and diagnose devices remotely through the Ethernet network



Devices and instrumentation available from anywhere on the network

“Schneider Electric built an efficient control system design and helped to control and conserve the necessary capital investments for this project by designing a solution that used common cabinets (i.e., server racks, communications, controller and I/O cabinets) and single network architecture.” — Torresol Energy (Spain)



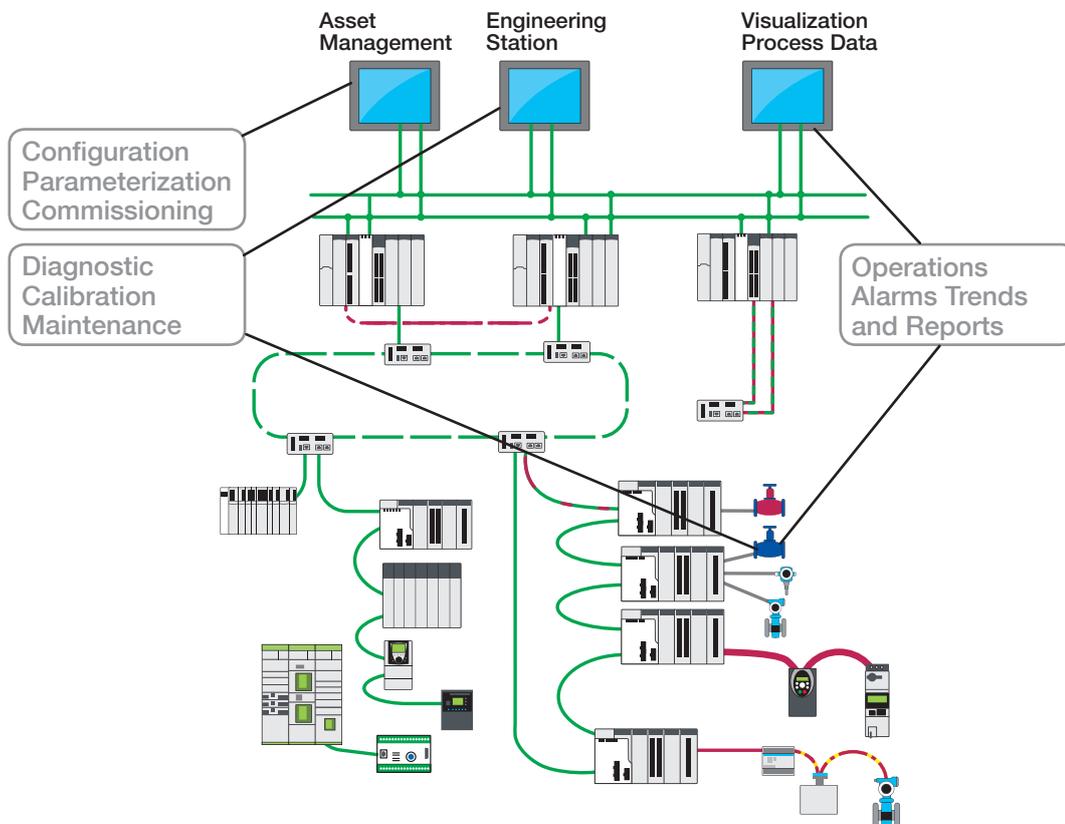
Embed device management in an open architecture

Get centralized control of all devices in your network

At the core of the PlantStruxure system is an open architecture. The key requirement for achieving a truly open network is the ability to easily configure and monitor network devices. PlantStruxure Ethernet architectures make it a reality by using standard Ethernet protocols and advanced software integration.

FDT/DTM is a technology that standardizes the way in which devices of different origin can be configured and managed from a single, common application. Schneider Electric has made FDT/DTM an integral part of PlantStruxure, by implementing it in our flagship application Unity Pro. This has multiple benefits for you:

- Configure as much of your Ethernet network and fieldbus devices possible from a single location. This simplifies the process and reduces common deployment errors.
- Reduce requirement for training and support by configuring as many devices as possible through the same application with Unity Pro.
- Optimize your operation by configuring your application equipment centrally, regardless of class, vendor or model.



Simplify configuration process and reduce configuration errors



Optimize your process with best-in-class products



Focus support efforts on a single software platform



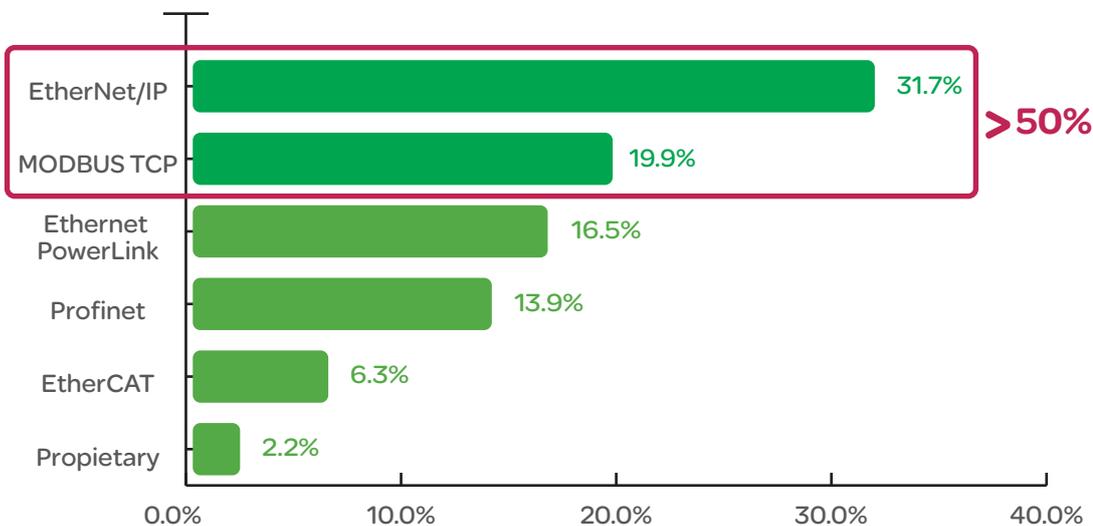
Build a sustainable industrial network for tomorrow

Our scalable and open architectures make it easier to keep up with the dynamic developments in networking

Ethernet has evolved into a powerhouse for industrial networks. Advances in speed, bandwidth capacity and reliability have allowed it to grow at a dramatic pace over the past five years, and at present, we see it as the fastest growing technology in this segment.

Due to its broad appeal and its adoption in Internet applications worldwide, the technology is continuously evolving. New uses and applications are continuing to grow, addressing pressing needs such as security and power over Ethernet.

The strength of PlantStruxure Ethernet architectures comes from their versatility. With a large capacity for protocols, they are well suited to tackle a wide range of applications and other industrial network needs, from I/O communications to motion.



2010 Industrial Ethernet shipments
ARC 2010 Report



Widely recognized industrial network in the world



Versatile and scalable to fit size or type of installation



Low cost of ownership with multi-vendor environment and off-the-shelf equipment

A comprehensive range to suit your requirements

PlantStruxure Ethernet architectures offer a wide selection of hardware and software solution to address the specific needs of your plant and enterprise.



Unity Pro V7:

Single software for Modicon PAC and PLCs.
Key features: FDT container + DTM catalogue
Benefits: A single configuration tool for your entire network.



ConneXium Network Manager:

Ethernet diagnostic and monitoring software tool.
Key features: Monitor Ethernet network performance.
Benefits: Take preventive action before potential problem affects network performance.



Industrial firewall:

ConneXium Industrial firewall.
Key features: Improve Ethernet security
Benefits: Improves system robustness against cyber security threats.



Modicon Quantum Ethernet IO System (CRP, CRA, X80-CRA, Dual ring switch):

High performance and availability system for mission critical I/O.
Key features: Deterministic performance in a standard Ethernet architecture.
Benefits: Ultimate flexibility without sacrificing performance.



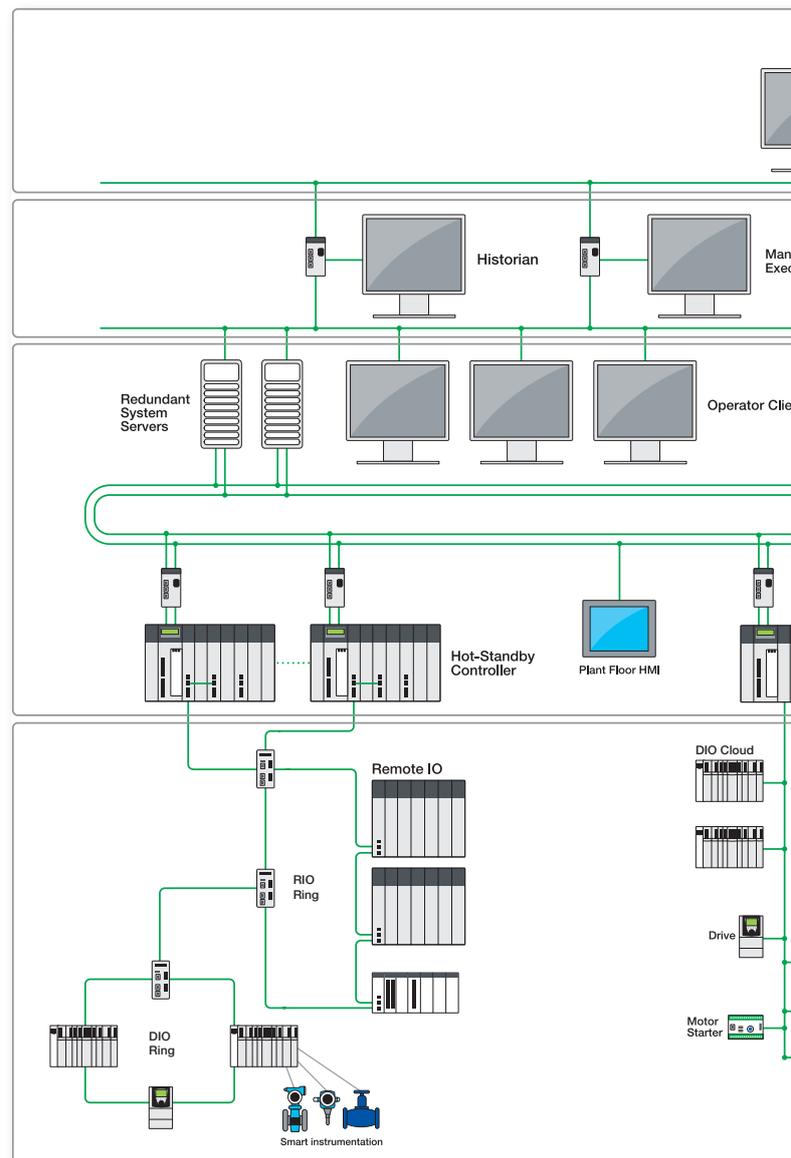
Modicon Quantum Ethernet Modules:

Multi-port Quantum Ethernet module for distributed architectures (DIO), HSBY compatible and ring capable.
Key features: Converged protocol support (simultaneous support of EtherNet/IP and Modbus TCP) with HSBY compatibility.
Benefits: Ultimate flexibility without sacrificing performance.



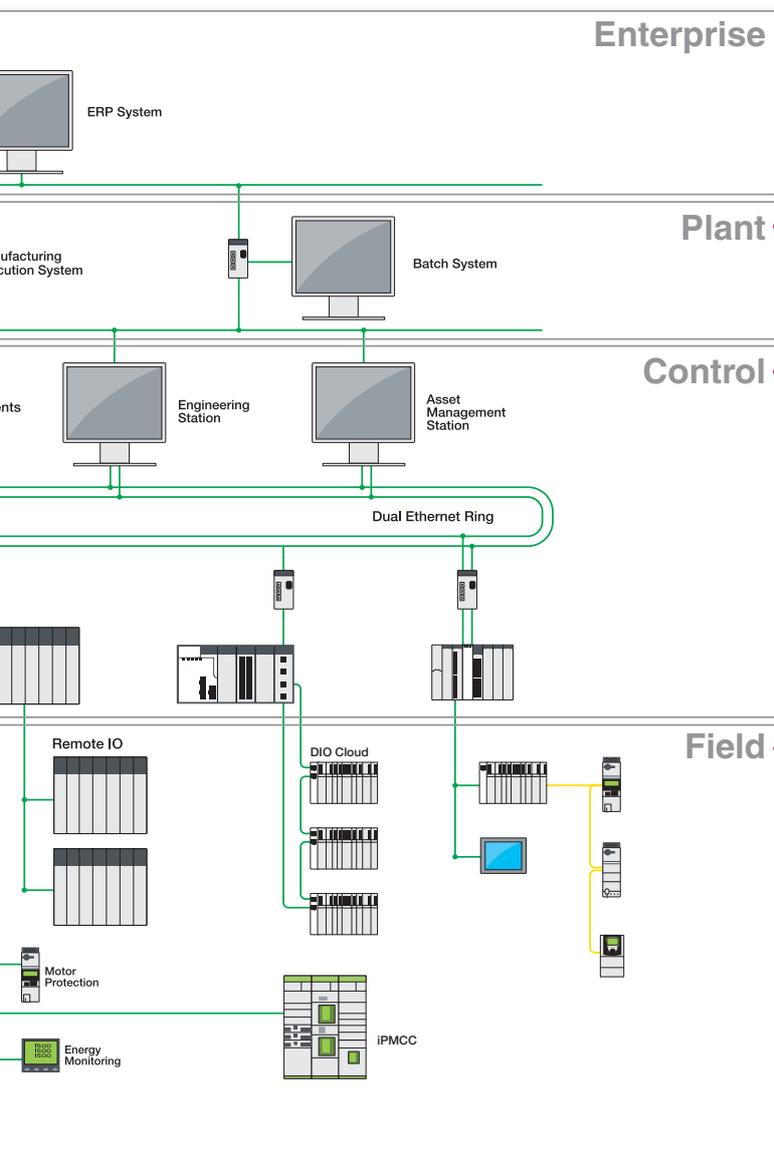
Modicon Quantum Control Modules:

Multi-port Quantum Ethernet module with routing capability and HSBY support.
Key features: Network transparency with HSBY compatibility.
Benefits: Provide transparent access to the network from the Plant and Enterprise levels.



Modicon Premium Ethernet Module:

Converged Ethernet module for distributed architectures.
Key features: Supports EtherNet/IP and Modbus TCP protocol simultaneously.
Benefits: Select best-in-class field devices.

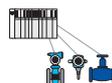


Enterprise

Plant

Control

Field



HART support (AHI module):

Modicon STB HART multiplexor.

Key features: Enables direct access from Asset Management Software or controllers to HART devices.

Benefits: PAC platform independent HART solution, up to 32 ch per Modicon STB island.

Managed switches:

ConneXium Industrial Ethernet managed switches.

Key features: Industrialised, high quality Ethernet infrastructure products.

Benefits: Tested and Validated for operability in Schneider Electric industrial networking solutions.



CANopen support (STB extension):

Modicon STB CANopen extension module.

Key features: Opens CANopen devices to Ethernet.

Benefits: Flexibility to choose the field network and devices that satisfy your requirements.

ConneXium Managed switches and ConneXium Basic Managed switches:

Ethernet switches in multiple configurations designed specifically for industrial networking applications.

Key features: Solid Ethernet network infrastructure.

Benefits: Cohesive, best-in-class network equipment for industrial use.



Modicon M340 Ethernet Module:

Multi-port Modicon M340 Converged Ethernet module.

Key features: EtherNet/IP and Modbus TCP protocol support and ring topology capability.

Benefits: Protocol flexibility and basic redundancy in a single device.



Dual port STB (NIP):

Modicon STB Network Interface Module with dual Ethernet ports.

Key features: Dual port construction and self-recovering ring topology support.

Benefits: Low cost alternative for a high availability architecture.

To learn more
Visit www.schneider-electric.com/PlantStruxure

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