

Transparent Ready

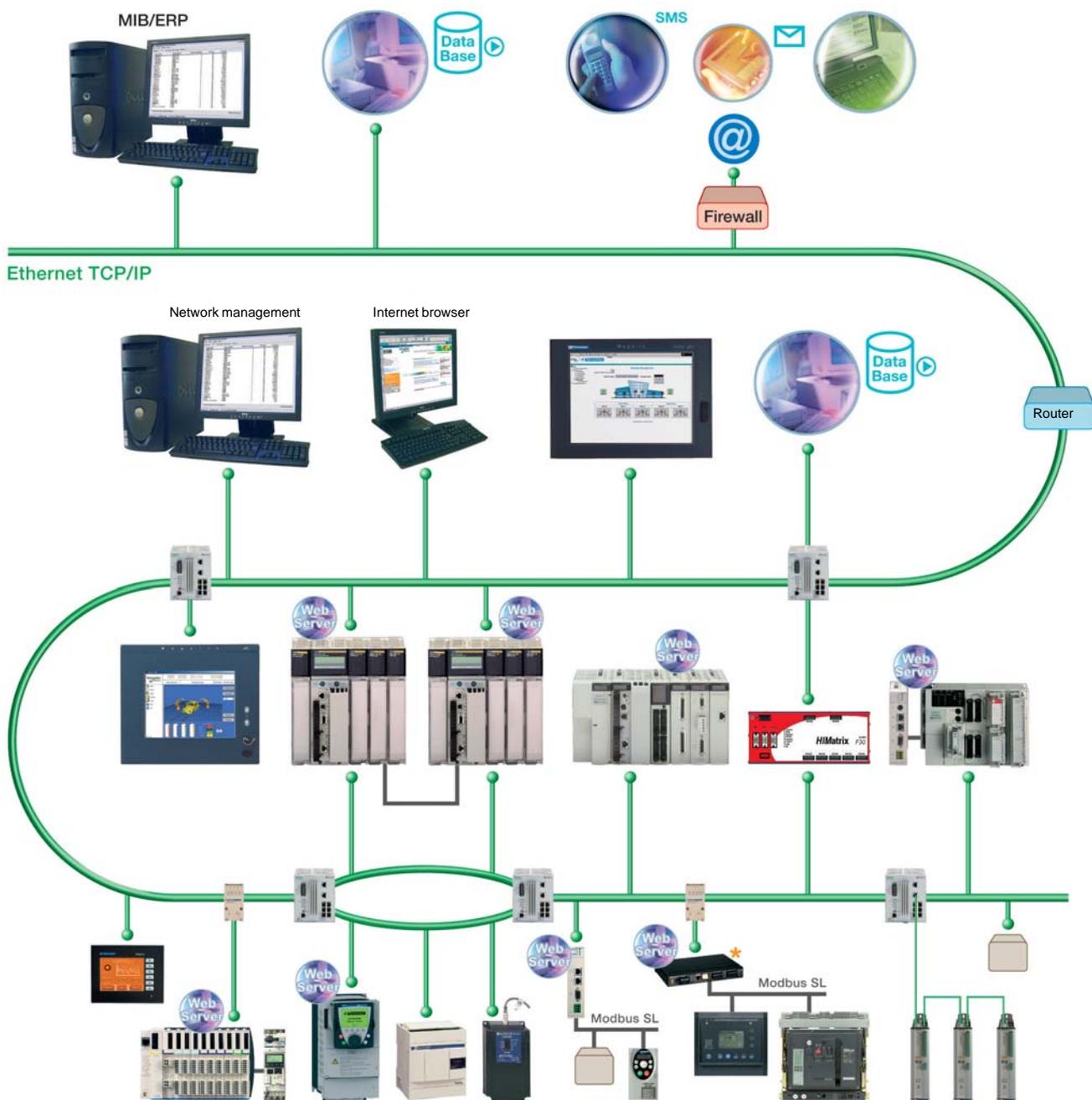
Universal technologies for a world without restrictions

Presentation

Transparent Ready making collaborative architectures a reality

Company environments are constantly changing due to the pressure of competition and the need for profitability. It is vital to take opportunities quickly. The challenge of today's world is therefore agility, which means adopting a **collaborative approach** to share data in real-time.

Schneider Electric's Transparent Ready products, based on universal Ethernet TCP/IP and Web technologies, meet this requirement. These industrial automation products (Trademark Telemecanique) and Electrical Distribution products (Trademark Merlin Gerin) can be integrated into real-time data-sharing systems, with no need for interfaces.



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Presentation (continued)

The universal communication standard: Ethernet TCP/IP

The recognition of Ethernet TCP/IP, both in organizations and on the Internet, has made it the **communication standard** of today. Its wide use is leading to a reduction in connection costs, increased performance and the addition of new functions, which all combine to ensure its durability.

Ethernet TCP/IP meets the connection requirements of every application:

- Twisted pair copper cables for simplicity and low cost.
- Optical fiber for immunity to interference and for long distances.
- Communication redundancy, inherent in the IP (*Internet Protocol*).
- Radio or satellite to overcome wiring restrictions.
- Remote point-to-point access via the telephone network or the Internet for the cost of a local call.

Ethernet TCP/IP, a truly open technology, supports all types of communication:

- Web pages.
- File transfer.
- Industrial messaging, etc.

With its high speed, the network no longer limits the performance of the application. The architecture can evolve without any difficulty. The products or devices remain compatible, ensuring the long-term durability of the system.

Modbus messaging: a standard technology adapted for the world of automation and electrical distribution

Modbus has been the de facto standard for serial link protocols in industry since 1979. It is used for the communication of millions of automation devices. As a result of this success, the Internet community has reserved the TCP 502 port for Modbus. Modbus is recognised by international standard IEC 61158 and is a "Chinese National Standard".

Modbus messaging can thus be used for exchanging automation data on both Ethernet TCP/IP and the Internet, as well as for all other applications (file exchange, Web pages, E-mail, etc).

The simple structure of Modbus is bringing it ever-increasing success. Users can download the specifications and source code for numerous devices that use the Modbus TCP/IP protocol, free of charge from the Modbus-IDA website:

www.modbus-ida.org

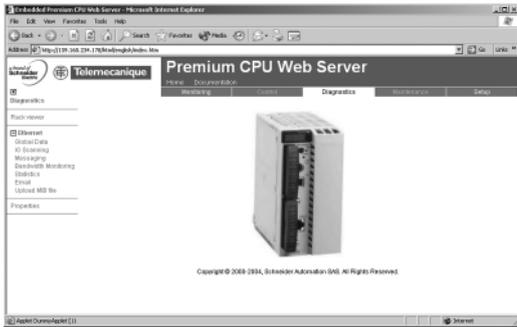
Building on its industrial expertise, Schneider Electric now has a complete offer of highly user-friendly services on Ethernet TCP/IP that are dedicated to the world of automation: Modbus TCP/IP messaging, optimized I/O Scanning, publication and subscription of variables between Controllers and PLCs (Global Data), automatic device reconfiguration (Faulty Device Replacement), bandwidth monitoring, system diagnostics (Web diagnostic), SOAP/XML Web services, etc.

The single network, requiring no interfaces between the worlds of information technology and automation, is now a reality.



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Presentation (continued)

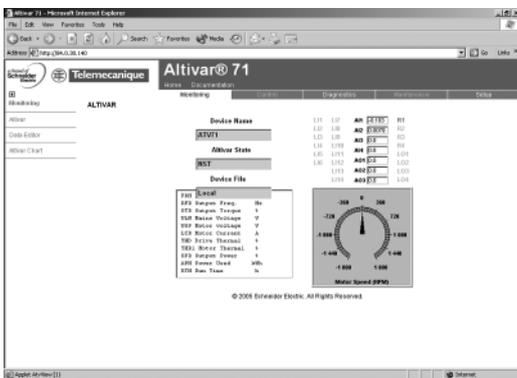
Free navigation on the Web Automation

In 1998, Schneider Electric broke new ground with the first on market Web servers embedded in Telemecanique PLCs.

With continuous innovations, Schneider Electric is spreading the use of Web technologies in industrial equipment by implementing Web servers inside new Telemecanique and Merlin Gerin devices such as PLCs and controllers, distributed I/Os, variable speed drives, power meters, etc.

These web servers represent the easiest solution to get remote and transparent access to equipment information and device diagnostics, simply using an Internet browser.

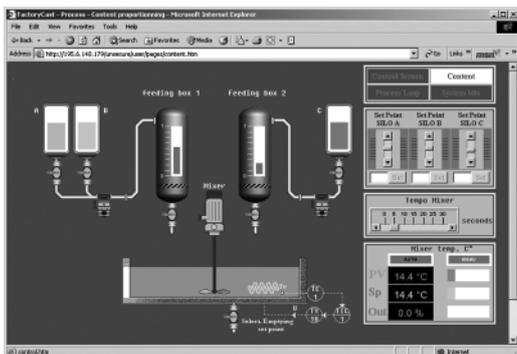
With FactoryCast HMI, Schneider Electric is taking an important step further, by making the Web Servers "Active", thus holding your HMI application as a Web server.



Not only does these active server provide Web pages displaying system and process information, but they also execute HMI functions at source in the PLC and controller device, totally autonomously, without making use of the controller processor: management of a real-time HMI database with data processing, E-mail transmission, direct connectivity with relational databases, etc.

With its functions embedded in a controller, the FactoryCast HMI active Web server:

- Simplifies or removes the need for conventional HMI/SCADA (*Supervision Control And Data Acquisition*) solutions, reducing communication via polling to update HMI/SCADA databases
- Provides multiclient remote control, without any special software on the client stations
- Provides a direct link to company information systems, without the need for any intermediary interface.



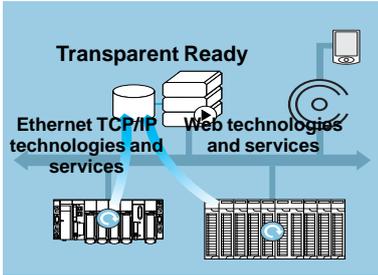
Transparent Ready for a world without restrictions

Schneider Electric has a wide range of Transparent Ready products: Controllers and PLCs, industrial PCs, HMI devices, variable speed drives, I/O modules, safety PLCs, gateways, servers, switches, SCADA software, inductive identification systems, etc.

These products provide different levels of Web services and communication services on Ethernet TCP/IP, according to users' requirements. In order to simplify choice and ensure their interoperability within a system, each Transparent Ready product is now identified by the class of services it provides.

With Transparent Ready, you have ...

- **Ingenuity** of collaboration improving agility
 - Transparency of information throughout the enterprise, make authorized people and tools, better share data.
- **Openess** of universal standards Ethernet TCP/IP with Modbus
 - Vendor independent and well known, so future proof and open
 - Only one communication technology to maintain
 - Seamless vertical & remote connections, enabling collaboration.
- **Simplicity** of Web technologies optimizing your Human Machine Interface
 - Easy and inexpensive local & remote access from a web browser (e.g. for maintenance)
 - Distribute Web servers on automation devices and remove bottlenecks
 - Combine Web technologies and traditional SCADA, to refocus SCADA on the control of the process.



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The Transparent Ready service classes make it possible to identify the services provided by each device:

- Diagnostic, display and control services via Web technologies
- Ethernet communication services.

The Transparent Ready service classes thus simplify the choice of devices and ensure their interoperability within an architecture.

Web service classes

The Web services are defined by 4 classes identified by a letter:

- Class **A**: No Web service
- Class **B**: Standard Web services
- Class **C**: Configurable Web services
- Class **D**: Active Web services.

Transparent Ready devices with an embedded Web server can provide 4 types of Web service:

- Maintenance Web services
- Control Web services
- Diagnostic Web services
- Optional Web services such as documentation or configuration.

The following table specifies the services provided by each Web service class (A, B, C or D).

Web server class		Web services			
		Maintenance	Monitoring and IT link	Diagnostics	Optional
D	Active Web server	- User website update	- Autonomous execution of specific services (e.g. alarm notification by E-mail, exchange with databases, calculations, ...) - SOAP/XML (client/server)	- User-defined states	- User documentation
C	Configurable Web server		- PLC variables editor - Remote commands - User Web pages - SOAP/XML (server)	- Communication service diagnostics - State of internal device resources	
B	Standard Web server	- Remote device software update - Remote auto-tests	- Device description - Data viewer	- Device status - Device diagnostic	- Configuration of network parameters and Ethernet communication services - Device documentation
A	No Web server	- No Web service			

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Service classes offered

Ethernet communication service classes

The Ethernet communication services provided by a device are defined by 3 classes, identified by a number:

- Class 10: standard Ethernet communication services
- Class 20: Ethernet communication management services (network level and device level)
- Class 30: advanced Ethernet communication services.

Transparent Ready devices can provide eight types of Ethernet communication service:

- Modbus TCP/IP messaging service
- I/O Scanning service
- FDR (*Faulty Device Replacement*) service
- SNMP network management service
- Global Data service
- Bandwidth management service
- NTP time synchronization service
- SMTP event notification service (E-mail).

These Ethernet communication services are described in chapter 2, "System approach", see pages 48290/2 to 43654/3.

The following table specifies the services provided for each Ethernet communication service class.

Ethernet communication service classes		Ethernet communication services							
		Modbus messaging	I/O Scanning	FDR	Network	Global Data	E-mail SMTP	Bandwidth management	Time synchronization NTP
30	Advanced services	- Direct reading/writing of I/O	- Periodic reading/writing of I/O - Configuration of the list of devices scanned	- Automatic control and updating of the device parameters configuration	- Use of the MIB library by an SNMP manager	- Publication and subscription of network variables	- Notification of events by E-mail	- Monitoring of load level	- Synchronization of device clocks
	20			Communication management services	- Automatic assignment of the IP address and network parameters - Control and updating of the configuration and device parameters by the user				
10					Standard services				

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Service classes offered

Choice of Transparent Ready devices

The services provided by a Transparent Ready device are identified by a letter defining the level of Web service, followed by a number defining the level of Ethernet communication service. For example:

- A class **A10** product is a device with no Web service and standard Ethernet services
- A class **C30** product is a device with a configurable Web server and advanced Ethernet communication services.

The services provided by a higher class include all the services supported by a lower class.

Transparent Ready devices are chosen from 4 main families:

- Sensor and preactuator type field devices (simple or intelligent)
- Controllers and PLCs
- Human Machine Interface (HMI) applications
- Dedicated gateways and servers.

The selection table on the following pages can be used for choosing Transparent Ready devices according to the required service classes.

		Web services			
		Class A	Class B	Class C	Class D
Ethernet communication services		No service	Standard	Configurable	Active
Class 30	Advanced service				
Class 20	Communication management services		B20	C20	
Class 10	Standard services	A10	B10		D10

B30 Controllers and PLCs
A10 B10 Simple and intelligent devices