W3C®

Presentation

SOAP/XML Web Services embedded in the PLC

When the Telemecanique PLC interacts directly with computer management applications.

Communication between platforms or applications is now a necessity in a market where **e-manufacturing** and **e-business** are an essential fact of life for companies.

Web service technology currently represents the most successful strategy for ensuring interoperability of heterogeneous software applications via an Intranet or the Internet, independently of any platform, operating system and programming language.

The standardisation of Web services has come about as a result of joint development between **Microsoft** and **IBM**, amongst others, validated at the **W3C** *(World Wide Web Consortium)* as an open "standard".
It now provides all the tools, specifications and environments needed for each platform.

Web services are based on standards such as:
■ **XML** *(eXtensible Markup Language)*: the universal standard for data exchange
■ **SOAP** *(Single Object Access Protocol)* protocol carried via the **HTTP** *(Hyper Text Transfer Protocol) channel.*
■ **WSDL** *(Web Services Description Language)* the Web Services description language, in **XML** format.

SOAP is currently considered to be the reference protocol, including in industry. It has since been adopted by the main players such as Microsoft (●NET, SQL Server, Office, etc), IBM (Java, Web Sphere), Lotus, ORACLE, Sub, SAP, ...

It becomes now also available in control system equipment within the FactoryCast Web server offer embedded in the Telemecanique PLCs.

### Embedded SOAP/XML Web Services: ModbusXMLDa Web services

The Telemecanique PLC integrates the Web services standard.

This new Transparent Ready service offers the previously unused (or uncommon) possibility of making an IT/e-business application interact directly with the control system levels using the same standards.
With the implementation of ModbusXMLDa *(Modbus XML Data access)* Web services in FactoryCast Web servers, the IT engineer can easily create his own application which will access the desired information directly in the PLC and in real time.
Data exchanges are made in XML standard format in response to a request using SOAP protocol.

The implementation of Web services in control system equipment makes it easy to achieve vertical integration of the control level and the creation of even more collaborative architectures which can be used to link production systems to the corporate management systems. It brings simplified access to information, a reduction in the costs of training, development and deployments costs, plus an increase in productivity.

Transparent Ready
System approach
SOAP/XML Web services
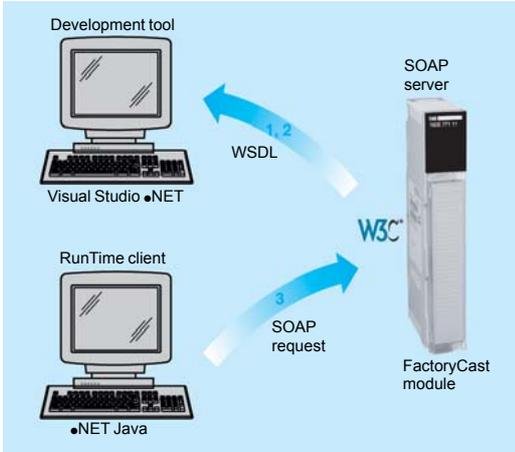
Implementation of the ModbusXMLDa Web services in FactoryCast modules

ModbusXMLDa server interface

This implementation enables a SOAP client application (management level computer application, MES, ERP, etc) to communicate directly with a FactoryCast Web server module embedded in the PLC.
Exchanges are initiated by the SOAP client application (the server responds to these requests).

■ **Step 1: Creation of the client application with learning of the Web services**. The development environment (for example, Visual Studio ●NET) looks in the FactoryCast server for the list of available services and their WSDL standard interfaces provided by the module.
■ **Step 2: Development of the client application**. The developer integrates the Web service functions using the code retrieved at the learning stage.
■ **Step 3: Execution of the client application**. The client application communicates in real time with the FactoryCast Web server module using the SOAP protocol.

ModbusXMLDa client interface

This implementation allows a FactoryCast HMI module to execute a SOAP client application in order to communicate with a remote SOAP server application (for example another FactoryCast Web server module or a computer management application, MES, ERP, etc).

Exchanges are initiated by the FactoryCast HMI client module (the remote application server responds to SOAP requests sent by the FactoryCast HMI module).

■ **Step 1: Configuration of ModbusXMLDa client service**. The user declares the PLC variables that are to be exchanged (in read or write mode), using the FactoryCast HMI configuration software.
■ **Step 2: Use of the application**. **ModbusXMLDa client service** executed in the FactoryCast HMI module communicates directly with the remote server application using SOAP requests in XML format.

Selection guide and list of implemented SOAP requests

The ModbusXMLDa functions are implemented in the following FactoryCast PLC modules.

ModbusXMLDa interface	FactoryCast modules	FactoryCast HMI modules
Server	**TSX ETZ 510** TSX Micro module **TSX ETY 5103** Premium module **140 NOE 771 11** Quantum module	**TSX WMY 100** Premium module **140 NWM 100 00** Quantum module
Client	–	**TSX WMY 100** Premium module **140 NWM 100 00** Quantum module

Requests implemented in the FactoryCast modules listed provide either physical or symbolic variables data access. They are defined in the table below.

Access to data via	ModbusXMLDa functions implemented in FactoryCast modules
Physical address	ReadDeviceIdentification
	ReadMultipleRegisters
	WriteMultipleRegisters
	ReadCoils
	WriteMultipleCoils
	ReadDiscreteInputs
Symbol	Read, operation to read item list value
	Write, operation to write item list value
	Browse, operation to browse item list