Fuzzy logic is used today to an increasing extent in the automation of technical processes. An efficient tool for the development and planning of process automation is provided by FuzzyControl++, incorporating empirical process expertise and verbally formulated empirical knowledge.

The challenge
Boolean algebra, the binary logic on which electronic data processing is based, has one major drawback. In our world not everything is black or white. There are many shades of gray as well as colors. This makes the need to transform analog values and impressions into “digital black and white” all the more complex.

This problem also arises with the automation of industrial processes, since temperatures, pressures or speeds, to name just three examples, are available from the process initially only in the form of analog measured values.

As an extension of classic 0/1 logic, any number of actual values are therefore permissible in the fuzzy logic as indistinct values, thus making it possible to represent statements that cannot be categorized unambiguously as true or false. Process-specific empirical knowledge and colloquially formulated control and regulation strategies can be simulated on computers in the form of simple “if-then” rules, such as “If temperature T is high and pressure P is very high, then close the valve.”

Fuzzy logic is thus recommended for non-linear controls and for predicting the behavior of mathematically complex procedures in the field of process automation. In other words, it is well-suited for tasks that would be very complicated to solve using conventional means, if they could be applied at all. With fuzzy logic, control systems, regulators, decision-making and diagnostic systems can thus be implemented in a way that is easy to understand.

Good reasons for FuzzyControl++:
- Module library for SIMATIC S7 and SIMATIC PCS 7
- Problem-free integration into the SIMATIC automation environment
- Intuitive user interface
- User-friendly solution for complex or elaborate process automation systems
- Simple simulation of process interventions made by experienced plant operators
- Easy-to-understand implementation of control systems, regulators, decision-making and diagnostic systems
- Substantial cost saving through increased efficiency in engineering
- Online analysis of the running process
Our solution
FuzzyControl++ and its predecessors have a proven track record going back 15 years. It has been used as a development and planning tool for fuzzy logic applications in a wide range of industries, including the glass and paper industries, breweries, chemicals and the steel industry.

The main areas of application are in mechanical engineering, production engineering and in the process industry. Examples of its use include regulating pressures, temperatures and filling levels, and also for positioning as well as speed and distance control.

Fuzzy logic is applied in early warning and diagnostic systems for early detection of dangerous states and for designing logic decision systems.

Easy to use
FuzzyControl++ is very easy to use and requires no special knowledge about fuzzy logic. The intuitive program interface is designed for simplicity, and the scope of performance is optimized to standard requirements.

Efficient project planning and analysis
Fuzzy systems are planned using PC or PG running Windows 2000 or XP, with support provided by a comprehensive online help function. It’s easy to plan relationship functions with FuzzyControl++. You can enter the rules either via a table editor or a matrix editor, and dynamic changes of the rule base can be identified right away. If none of the rules is applicable, simply specify a default value for the particular output. Online analysis of the fuzzy systems is carried out optionally by a graph plotter or multidimensional graphics.

Problem-free integration in your automation environment
Special function blocks ensure trouble-free operation of FuzzyControl++ on the SIMATIC S7/PCS 7 automation systems, and SIMATIC WinCC integrates the fuzzy systems as ActiveX components.

Perfect communication with NeuroSystems
FuzzyControl++ provides a straightforward means of exchanging data with the NeuroSystems tool via FPL (Fuzzy Programming Language) files. This tool is the basis for easy data-based optimization of fuzzy systems and the use of neuro-fuzzy systems.

Ordering information:
- FuzzyControl++ project planning tool V6.0, single license, SIMATIC S7 modules, MPI license, online help, manual, German and English
  Order No.: 2XV9450-1WC10-0AA1
- Driver license for additional protocols:
  - PROFIBUS
    Order No.: 2XV9450-1WC10-0BA0
  - TCP/IP
    Order No.: 2XV9450-1WC10-0CA0
  - Industrial Ethernet
    Order No.: 2XV9450-1WC10-0DA0

Runtime Software for SIMATIC S7:
- Modules for SIMATIC S7 are included in the basic package
- Requirements for SIMATIC S7
  SOFTNET S7 SIMATIC NET all SIMATIC CPs (except for CP5511 and PC adapter)
  Order No.: 2XV9450-1WC10-0EA0
- PCS 7 package with module and faceplate for SIMATIC PCS 7 V7.0 SP1 and higher versions
  Order No.: 2XV9450-1WC10-0PA0

Runtime Software for SIMATIC PCS 7:
- CFC package with modules and faceplate for SIMATIC PCS 7 V5.2 SP2 and higher versions
  Order No.: 2XV9450-1WC10-0EA0
- PCS 7 package with module and faceplate for SIMATIC PCS 7 V7.0 SP1 and higher versions
  Order No.: 2XV9450-1WC10-0PA0

Runtime Software for SIMATIC WinCC:
- ActiveX Control
  Order No.: 2XV9450-1WC10-0JA0

Runtime Software for OPC Client DA:
- OPC
  Order No.: 2XV9450-1WC10-0KA0

Copying license:
- SIMATIC S7 and SIMATIC PCS 7 data blocks
  Order No.: 2XV9450-1WC11-4XA0

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