Computer Aided Design of Sequential Control Algorithms for PLC

Broadly known and currently used Programmable Logic Controller (PLC) programming languages such as text ones (Instruction List – IL, Structured Text – ST) or graphic (Ladder Diagram – LD or Functional Block Diagram – FBD) do not exhaust all the needs in a field of industrial controllers programming. In the last years especially graphic languages were developing fast increasingly gaining popularity because they do not require deep knowledge of a controller neither program environment.

We propose to take part in works connected to:

1. a graphic–text interface design dedicated to specific applications in industrial control, aiding in software design for concrete type of PLC, for instance based on cyclograms, so called truth tables, logical switching functions or other, convenient for a programmer, form of technological sequence description introduced to the interface. Such software, apart from comfortable interface, can automatically solve problems of unrecognisable states in sequential control, logical functions minimisation (control program minimisation) and PLC program codes generation;
2. design (work out) of Program Organisation Unit for existing or newly being created environment for aiding PLC controller programming, for example chosen Function Blocks or Programs.

In the Division of Control Systems we have the following laboratories for education and research:

- Computer Control Laboratory,
- Industrial Monitoring and Control Laboratory,
- Automation Laboratory,
- Industrial Metrology Laboratory.

Selected publications:

1. Z. Ociepa, W. Tarnowski: *Computer Aided Design of Control Systems in Didactics*, Proceedings of XVI National Conference on Automatics, Zielona Góra, June 2002.
2. W. Tarnowski: *Automatic Control Systems Design*, Chapter 7 by Z. Ociepa: *Discrete Regulators*, Technical University of Koszalin Press, 2002.
3. W. Tarnowski, T. Kiczkowiak, Z. Ociepa (contractor), H. Budzisz: *Computer Aided Design of Pneumatic Driving Systems*, The State Committee for Scientific Research (KBN) grant report No. 7 T07C 02109, Koszalin-KBN, 1998.
4. R. Gwadera, T. Kiczkowiak, Z. Ociepa: *Computer Algorithm for Converting Sequential Pneumatic Control-Driving System to Combinational One*, Czasopismo Hydraulika i Pneumatyka (Hydraulics and Pneumatics Magazine), book 2'97, pp. 7÷9, 1997.

Training

Licence training in PLC controllers programming, Human Machine Interface (HMI) and Supervisory Control And Data Acquisition (SCADA) systems in the framework of regional employment restructurisation plans, post graduate studies, new technologies implementation (only Siemens and other European companies).

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