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Functional Requirements Documentation for Control Software Applications

Approved 29 October 2007

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Functional Requirements Documentation for Control Software Applications

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Foreword

Learning and configuring today's control software packages is easier than ever before. Documentation, however, is not such an easy task. With the increased capabilities of software packages to handle more process and operator interfaces, the complexity of defining and documenting these requirements increases. This standard directly addresses this documentation issue.

The ISA5.6 subcommittee was established by ISA5, Documentation of Measurement and Control Instruments and Systems, at the request of control systems engineers involved in the automation of plant operations using a wide variety of computer-based platforms. These platforms included distributed control systems, programmable logic controllers and industrialized personal computers offered by a variety of suppliers.

The need for documentation to help define control software prior to hardware selection, especially for batch sequence logic, was identified due to its complexity. ISA's Standards & Practices Board subsequently expanded the scope of ISA5.6 to include the software documentation of continuous processes.

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1 Scope

The scope of this standard is:

- Covers real-time batch, discrete and continuous process automation systems.
- Defines regulatory, event-driven and time-driven control system actions.
- Encompasses both digital and analog control devices in addition to non-control actions (for example, operator messages and batch end reports).
- Encompasses both normal and abnormal operational requirements of systems and shows the interactions between them.
- Uses a set of terms that relate directly to the languages commonly used by plant operators.
- Excludes interactions with higher-level systems.

Within the parameters of this scope, the standard is intended to:

- Establish functional requirements specifications for control software documentation that covers the classes of industrial automation equipment and systems consisting of distributed control systems, programmable controllers and industrial personal computers (see Figure 1).
- Provide techniques for documenting control system software. The software to be generated is a function of the computer system chosen for a particular project. The documentation procedure set forth in this standard is independent of the hardware/software system that is chosen.
- Provide a basis for validation of run-time application software after it is developed and tested to ensure that the initial requirement specification has been met.

The documentation resulting from use of this standard:

- Can be used for control software definition, design, testing and validation.
- Is not intended to require specialized knowledge of any particular engineering or computer science discipline to develop or understand.

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