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Function blocks for industrial-process measurement and control systems –

Part 3: Tutorial information



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FUNCTION BLOCKS FOR INDUSTRIAL-PROCESS MEASUREMENT AND CONTROL SYSTEMS –

Part 3: Tutorial information

FOREWORD

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IEC 61499-3, which is a technical report, has been prepared by working group 6: Function blocks, of IEC technical committee 65: Industrial-process measurement and control systems.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
65/308/DTR	65/321/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

IEC 61499 consists of the following parts under the general title *Function blocks for industrial-process measurement and control systems:*

Part 1: Architecture

Part 2: Software tools requirements

Part 3: Tutorial information

Part 4: Communication requirements

NOTE Parts 1 and 2 are under consideration.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

The following gives a description of the contents of the various parts of IEC 61499.

a) Part 1 contains
   - general requirements, including an introduction, scope, normative references, definitions, and reference models;
   - rules for the declaration of function block types, and rules for the behaviour of instances of the types so declared;
   - rules for the use of function blocks in the configuration of distributed industrial-process measurement and control systems (IPMCSs);
   - rules for the use of function blocks in meeting the communication requirements of distributed IPMCSs;
   - rules for the use of function blocks in the management of applications, resources and devices in distributed IPMCSs.

b) Part 2 defines requirements for software tools to support the following systems engineering tasks enumerated in 1.1 of IEC 61499-1:
   - the specification of function block types;
   - the functional specification of resource types and device types;
   - the specification, analysis, and validation of distributed IPMCSs;
   - the configuration, implementation, operation, and maintenance of distributed IPMCSs;
   - the exchange of information among software tools.

c) Part 3 has the purpose of increasing the understanding, acceptance, and both generic and domain-specific applicability of IPMCS architectures and software tools meeting the requirements of the other parts, by providing
   - answers to Frequently Asked Questions (FAQs) regarding IEC 61499;
   - examples of the use of IEC 61499 constructs to solve frequently encountered problems in control and automation engineering.

d) Part 4 defines rules for the development of compliance profiles which specify the features of IEC 61499-1 and IEC 61499-2 to be implemented in order to promote the following attributes of IEC 61499-based systems, devices and software tools:
   - interoperability of devices from multiple suppliers;
   - portability of software between software tools of multiple suppliers; and
   - configurability of devices from multiple vendors by software tools of multiple suppliers.

FUNCTION BLOCKS FOR INDUSTRIAL-PROCESS MEASUREMENT AND CONTROL SYSTEMS –

Part 3: Tutorial information

1 Scope

This part of IEC 61499, which is a technical report, is intended to provide a simple shorthand for common functionality in a broad number of "application domains" and, to that extent, may be considered a "language". It should be noted that IEC 61499 is not a programming methodology *per se*.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61131-3:2003, *Programmable controllers – Part 3: Programming languages*

IEC 61804-1:2003, *Function blocks (FB) for process control – Part 1: Overview of system aspects*

IEC 61804-2:2004, *Function blocks (FB) for process control – Part 2: Specification of FB concept and Electronic Device Description Language (EDDL)*

3 Frequently asked questions (FAQ)

3.1 General questions

What is this clause about?

This clause is a compilation of responses to FAQ about the various parts of IEC 61499.

What good is IEC 61499?

IEC 61499-compliant distributed industrial-process measurement and control systems (IPMCSs), devices, and their associated life-cycle support systems will be able to deliver a number of significant benefits to their owners and system integrators, including:

a) IEC 61499-compliant life-cycle support systems will be able to **reduce engineering costs** through integrated facilities for configuration, programming and data management. Additional engineering cost savings will result from the **ease of system integration** provided by IEC 61499's simple yet complete model of distributed systems. This model provides hardware- and operating-system-independent representations for all functions of the system, including control and information processing as well as communications and process interfaces.

b) Engineers and technicians will be able to **reduce system implementation time** by applying a common set of concepts and skills to all elements of the system. Further reductions in implementation time will result from the elimination of software patches and "glueware" formerly required to integrate incompatible system elements and software tools.

   1) The elimination of patchware and glueware, the availability of interoperable software tool sets, the portability of engineering skills, and the ease of integration of system elements, will yield **higher reliability and maintainability** over the system life cycle.