TECHNICAL REPORT

IEC TR 62390

First edition
2005-01

Common automation device – Profile guideline

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PRICE CODE XB

For price, see current catalogue

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMON AUTOMATION DEVICE – PROFILE GUIDELINE

FOREWORD

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IEC 62390, which is a technical report, has been prepared by IEC technical committee 65: Industrial-process measurement and control, and ISO SC5 of ISO technical committee 184: Enterprise-control system integration.

It is published as a double logo standard.

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

Enquiry draft	Report on voting
65/334/DTR	65/340/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.

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- withdrawn,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

This guideline is a recommended outline for use by standardization product committees, fieldbus consortia and product manufacturers to develop and provide profiles for networked devices. Some aspects of this guideline may also be applicable to stand-alone devices. The present wide variation in the form of concepts and methods used for disclosing device information and behaviour to users of devices leads to longer evaluations required to understand how to use and apply networked industrial devices. This variation makes determining device interoperability, interchangeability, comparisons and common device behaviour more difficult. Therefore, it is the intention of this guideline to provide a common and more generic way to publish device information and behaviour. This is a contribution to reduce the total cost of the industrial control system.

Profiles define a common set of functionality for a class of devices in a given industrial domain, thus allowing system designers, system integrators and maintenance staff to handle profile-based devices without special tool configuration. They also allow consistent structuring and semantics of device functionality.

NOTE Other technologies are available to support the integration of devices into control systems, in particular to handle manufacturer-specific extensions in commissioning and engineering tools. Examples of such technologies are device description languages, which detail the internal structure of the device, or standardized software interfaces, where each device is represented by a dedicated software component.

Figure 1 shows the various possible profile documents and the typical writer of each document. The figure also illustrates the developing sequence for the developing of the profile documents. It is proposed that this profile guideline be the base for other working groups to develop profile standards and product class profiles. The root device profiles and the manufacturer device profiles can be developed from these profile standards. Finally, the manufacturer can create the specific device descriptions for his products. Any shortcut is possible between device profile documents.

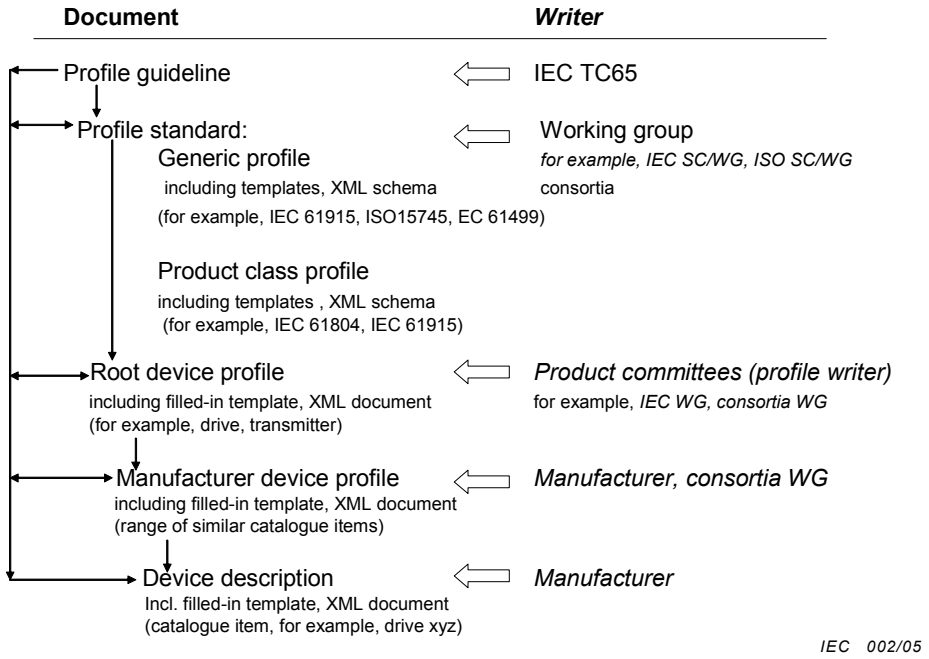


Figure 1 – Profile documents and their profile writer

This guideline provides the context, recommended minimum contents and construction rules for device profiles. Recommended generic device models, appropriate analysis and design diagrams using standards as UML (Unified Modeling Language) and methods to construct those models are provided.

This guideline provides recommendations for conveying the necessary device information to non-human users of the device profile such as software tools and application programs in an electronic file. These recommendations include the use of standards such as XML (eXtensible Markup Language).

COMMON AUTOMATION DEVICE – PROFILE GUIDELINE

1 Scope

This Technical Report provides guidance for the development of device profiles for industrial field devices and control devices, independent of their complexity.

NOTE 1 Examples of devices covered are limit switches and contactors for simple device networks, medium complex devices, such as transmitters and actuators for process control, and complex devices for fieldbuses, such as power drive systems.

NOTE 2 This guideline is also recommended to be used for devices such as programmable controllers, network components and HMI. If a device is user programmable, its features, as introduced in this guideline (for example, parameters and behaviour), cannot be completely described in the profile. However, profile writers may agree on general common functions like Start, Stop and Reset as well as identification and process inputs/outputs.

A device profile may cover various aspects such as physical, functional, communication, electrical and functional safety as well as application system aspects, irrespective of whether these aspects are accessible over the network. This guideline focuses on the functional aspects of the device (see 3.1.9).

NOTE 3 Different users of a device profile such as device manufacturers, system integrators and maintenance operators may only use specific aspects of the profile.

The guideline is written in a network independent way. Therefore, it is applicable for various fieldbuses, including those based on Ethernet. The guideline is intended to be used by IEC product standards committees and industrial communications networks consortia when they develop their device profile organizations and structures. It is not intended to provide an outline for a specific device profile. Further, this guideline presents device models to better guide and delineate a device profile's content. The profile guideline allows the use of a parameter list, function block model and/or object model to convey the structure and behaviour of the device in a unique manner. It is up to the profile writers to decide which of the models they apply.

To be useful to users a common method for conveying the device profile information is required. This guideline recommends the use of device profile templates. This guideline gives an example of a template, which is intended to be the basis of the structure and content of further templates which may be developed by the relevant profile groups.

This will allow users of these profiles to make comparisons, determine interoperability and interchangeability, and recognize common device behaviour.

The development of industrial application and process profiles, as covered by ISO 15745-1, is not within the scope of this guideline.

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/PAS 61499-1:2000, *Function blocks for industrial-process measurement and control systems – Part 1: Architecture*

IEC/PAS 61499-2:2001, Function blocks for industrial-process measurement and control systems – Part 2: Software tools requirements

IEC/PAS 61804 (all parts), *Function blocks (FB) for process control*

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

ISO 15745 (all parts), *Industrial automation systems and integration – Open systems application integration framework*

ISO 15745-1:2003, *Part 1: Generic reference description*