

PD CLC/TS 62603-1:2014



BSI Standards Publication

Industrial process control systems — Guidelines for evaluating process control systems

Part 1: Specifications

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National foreword

This Published Document is the UK implementation of CLC/TS 62603-1:2014. It supersedes PD IEC/TS 62603-1:2014, which is withdrawn.

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A list of organizations represented on this subcommittee can be obtained on request to its secretary.

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English Version

**Industrial process control systems - Guideline for evaluating
process control systems - Part 1: Specifications
(IEC/TS 62603-1:2014)**

Systèmes de commande des processus industriels - Lignes
directrices pour l'évaluation des systèmes de commande de
processus - Partie 1: Spécifications
(CEI/TS 62603-1:2014)

Industrielle Prozessleitsysteme - Richtlinie für die
Beurteilung der Leistung von Prozessleitsystemen - Teil 1:
Festlegungen
(IEC/TS 62603-1:2014)

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Foreword

The text of document 65B/875/DTS, future edition 1 of IEC/TS 62603-1, prepared by SC 65B "Measurement and control devices" of IEC/TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as CLC/TS 62603-1:2014.

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The text of the Technical Specification IEC/TS 62603-1:2014 was approved by CENELEC as a Technical Specification without any modification.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60038 (mod)	2009	IEC standard voltages	EN 60038	2011
IEC 60050	series	International Electrotechnical Vocabulary	-	series
IEC 60079-10	-	Electrical apparatus for explosive gas atmospheres -- Part 10: Classification of hazardous areas	EN 60079-10	-
IEC 60079-10-1	-	Explosive atmospheres -- Part 10-1: Classification of areas - Explosive gas atmospheres	EN 60079-10-1	-
IEC 60079-10-2	-	Explosive atmospheres -- Part 10-2: Classification of areas - Combustible dust atmospheres	EN 60079-10-2	-
IEC 60079-11	-	Electrical apparatus for explosive gas atmospheres -- Part 11: Intrinsic safety "i"	EN 60079-11	-
IEC 60079-14	-	Explosive atmospheres -- Part 14: Electrical installations design, selection and erection	EN 60079-14	-
IEC 60300-3-4	-	Dependability management -- Part 3-4: Application guide - Guide to the specification of dependability requirements	EN 60300-3-4	-
IEC 60654-1	-	Industrial-process measurement and control equipment - Operating conditions -- Part 1: Climatic conditions	EN 60654-1	-
IEC 60654-2	-	Operating conditions for industrial-process measurement and control equipment -- Part 2: Power	EN 60654-2	-
IEC 60654-3	-	Operating conditions for industrial-process measurement and control equipment -- Part 3: Mechanical influences	EN 60654-3	-
IEC 60654-4	-	Operating conditions for industrial-process measurement and control equipment -- Part 4: Corrosive and erosive influences	EN 60654-4	-
IEC 60721-3-1	-	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities -- Section 1: Storage	EN 60721-3-1	-
IEC 60721-3-2	-	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities -- Section 2: Transportation	EN 60721-3-2	-
IEC 60721-3-3	-	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities -- Section 3: Stationary use at weatherprotected locations	EN 60721-3-3	-

IEC 60721-3-4	-	Classification of environmental conditions - EN 60721-3-4 - Part 3: Classification of groups of environmental parameters and their severities -- Section 4: Stationary use at non-weatherprotected locations	-
IEC 60848	-	GRAFCET specification language for sequential function charts	EN 60848 -
IEC 60870-4	-	Telecontrol equipment and systems -- Part 4: Performance requirements	HD 546.4 S1 -
IEC 61000-4-2	-	Electromagnetic compatibility (EMC) -- Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test	EN 61000-4-2 -
IEC 61000-4-3	-	Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test	EN 61000-4-3 -
IEC 61000-4-4	-	Electromagnetic compatibility (EMC) -- Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test	EN 61000-4-4 -
IEC 61000-4-5	-	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5 -
IEC 61000-4-6	-	Electromagnetic compatibility (EMC) -- Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6 -
IEC 61000-4-8	-	Electromagnetic compatibility (EMC) -- Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test	EN 61000-4-8 -
IEC 61000-4-9	-	Electromagnetic compatibility (EMC) -- Part 4-9: Testing and measurement techniques - Pulse magnetic field immunity test	EN 61000-4-9 -
IEC 61000-4-10	-	Electromagnetic compatibility (EMC) -- Part 4-10: Testing and measurement techniques - Damped oscillatory magnetic field immunity test	EN 61000-4-10 -
IEC 61000-4-11	-	Electromagnetic compatibility (EMC) -- Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests	EN 61000-4-11 -
IEC 61000-6-4	-	Electromagnetic compatibility (EMC) -- Part 6-4: Generic standards - Emission standard for industrial environments	EN 61000-6-4 -
IEC 61025	-	Fault Tree Analysis (FTA)	EN 61025 -
IEC 61069-1	-	Industrial-process measurement and control - Evaluation of system properties for the purpose of system assessment -- Part 1: General considerations and methodology	EN 61069-1 -
			+EN 61069-1:1993/corrigendum Nov. 1993 1993

IEC 61069-4	-	Industrial process measurement and control - Evaluation of system properties for the purpose of system assessment -- Part 4: Assessment of system performance	EN 61069-4	-
IEC 61069-5	-	Industrial-process measurement and control - Evaluation of system properties for the purpose of system assessment -- Part 5: Assessment of system dependability	EN 61069-5	-
IEC 61069-6	-	Industrial-process measurement and control - Evaluation of system properties for the purpose of system assessment -- Part 6: Assessment of system operability	EN 61069-6	-
IEC 61069-7	-	Industrial-process measurement and control - Evaluation of system properties for the purpose of system assessment -- Part 7: Assessment of system safety	EN 61069-7	-
IEC 61069-8	-	Industrial-process measurement and control - Evaluation of system properties for the purpose of system assessment -- Part 8: Assessment of non-task-related system properties	EN 61069-8	-
IEC 61078	-	Analysis techniques for dependability - Reliability block diagram and Boolean methods	EN 61078	-
IEC 61131-2	-	Programmable controllers -- Part 2: Equipment requirements and tests	EN 61131-2	-
IEC 61131-3	-	Programmable controllers -- Part 3: Programming languages	EN 61131-3	-
IEC 61140	-	Protection against electric shock - Common aspects for installation and equipment	EN 61140	-
IEC 61158	series	Industrial communication networks - Fieldbus specifications	FprEN 61158	series
IEC 61326-1	-	Electrical equipment for measurement, control and laboratory use - EMC requirements -- Part 1: General requirements	EN 61326-1	-
IEC 61508	series	Functional safety of electrical/electronic/programmable electronic safety-related systems	EN 61508	series
IEC 61511	series	Batch control	EN 61511	series
IEC 61512	series		EN 61512	series
IEC 61784	series		EN 61784	series
IEC 62305-1 (mod)	-	Protection against lightning -- Part 1: General principles	EN 62305-1	-
IEC 62347	-	Guidance on system dependability specifications	+AA EN 62347	201X -
IEC 62381	-	Automation systems in the process industry - Factory acceptance test (FAT), site acceptance test (SAT) and site integration test (SIT)	EN 62381	-
IEC 62443-2-1	-	Industrial communication networks - Network and system security -- Part 2-1: Establishing an industrial automation and control system security program	-	-

IEC 62443-3-3	-	Industrial communication networks - Network and system security - Part 3-3: System security requirements and security levels	-	-
IEC/TR 62380	-	Reliability data handbook - Universal model for reliability prediction of electronics components, PCBs and equipment	-	-
ISO/IEC 14764	2006	Software Engineering - Software Life Cycle- Processes - Maintenance	-	-
IEEE 802.11	-	IEEE Standard for Information technology- Telecommunications and information exchange between systems-Local and metropolitan area networks-Specific requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications	-	-
ISA 18.1- 1979(R1992)	-	annunciator sequences and specifications	-	-
ISA 18.2-2009	-	Management of alarm systems for the process industries	-	-
ISA 37.1-1975 (R1982)	-	Electrical Transducer Nomenclature & Terminology	-	-
ISA S88	-	Batch control	-	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

INDUSTRIAL PROCESS CONTROL SYSTEMS – GUIDELINE FOR EVALUATING PROCESS CONTROL SYSTEMS –

Part 1: Specifications

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 62603-1, which is a technical specification, has been prepared by subcommittee 65B: Measurement and control devices, of IEC technical committee 65: Industrial-process measurement, control and automation.

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

Enquiry draft	Report on voting
65B/875/DTS	65B/905/RVC

Full information on the voting for the approval of this technical specification 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.

A list of all parts in the IEC 62603 series, published under the general title *Industrial process control systems – Guideline for evaluating process control systems*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability 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

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This International Technical Specification defines a procedure for verifying if a given Process Control System (PCS) satisfies the technical requirements specified by the end-user or by an engineering company for a specific application. The basic concept of this document is that “you can test what you have specified”. A testing procedure is meaningless if it does not include a procedure for specifying the technical requirements to be tested.

This Technical Specification was developed in the framework of the existing standards that define the general concepts of PCS design and testing, that is:

- IEC 61069 Industrial process measurement and control – Evaluation of system properties for the purpose of system assessment – Parts 1,2,3,4,5,6,7,8
- IEC 62381 Automation systems in the process industry – Factory acceptance test (FAT), site acceptance test (SAT), and site integration test (SIT)

The group of standards 61069 defines the general methodology, definitions, and procedures for assessing the functional characteristics of a PCS (Part 1 and 2) in terms of functionalities (Part 3), performances (Part 4), dependability (Part 5), operability (Part 6), safety (Part 7), and non-task-related properties (Part 8). IEC 62381 gives additional details about the general procedures for testing a PCS in factory, on site, and after the general integration of the complete system.

The IEC 62603 fully complies with these standards and gives a detailed guidance for specifying a PCS and for testing the specified functions. IEC 61069 and 62381 create a framework that is valid for any PCS as a system, while 62603, inside this framework, gives the users guidance for specifying the PCS he needs for carrying out the required functions.

INDUSTRIAL PROCESS CONTROL SYSTEMS – GUIDELINE FOR EVALUATING PROCESS CONTROL SYSTEMS –

Part 1: Specifications

1 Scope

This International Technical Specification describes methods and provides guidance for the evaluation of Process Control Systems (PCS) during the phase of selection between different proposals.

The methods of evaluation proposed in this technical specification are intended for use mainly by users, engineering companies, or independent test laboratories, to verify manufacturers' proposals during the tender (as described in IEC 62603-1) or the provided Process Control System during the FAT procedure.

The specification and test procedures specified in this technical specification apply to a large variety of automation systems, both based on conventional technology (e.g. 4 mA to 20 mA field devices) and based on Intelligent Field Devices (IFD) with serial communication of any kind. For this reason, the tests specified in this technical specification are not necessarily sufficient for automation systems specifically designed for special duties. In such cases, user and manufacturer should define additional tests for assessing specific functions or performances.

The procedure for specifying the PCS technical requirements, evaluating the different offers, and carrying out the tests on the chosen PCS differs from one company to another and from one project to another, but some common steps exist, as Figure 1 shows. The IEC 62603 considers this process divided into two steps: definition of the PCS technical requirements (in the scope of IEC 62603-1) and test of the chosen PCS.