SVENSK STANDARD SS-EN IEC 62443-4-1

Fastställd	Utgåva	Sida	Ansvarig kommitté
2018-10-17	1	1 (1+56)	SEK TK 65

IT-säkerhet i industriella automationssystem – Del 4-1: Säkerhetsfordringar under produktutvecklingens livscykel

Security for industrial automation and control systems –
Part 4-1: Secure product development lifecycle requirements

Som svensk standard gäller europastandarden EN IEC 62443-4-1:2018. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 62443-4-1:2018.

Nationellt förord

Europastandarden EN IEC 62443-4-1:2018

består av:

- **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
- **IEC 62443-4-1, First edition, 2018 - Security for industrial automation and control systems - Part 4-1: Secure product development lifecycle requirements**

utarbetad inom International Electrotechnical Commission, IEC.

EN från CENELEC som är identiska med motsvarande IEC-standarder och som görs tillgängliga för nationalkommittéerna efter den 1 januari 2018 får en beteckning som inleds med EN IEC istället för som tidigare bara EN.

ICS 25.040.40; 35.030.00

Denna standard är fastställd av SEK Svensk Elstandard,
som också kan lämna upplysningar om **sakinnehållet** i standarden.
Postadress: Box 1284, 164 29 KISTA
Telefon: 08 - 444 14 00.
E-post: sek@elstandard.se. Internet: www.elstandard.se

Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a mätning, säkerhet och provning och för utförande, skötsel och dokumentation av elprodukter och elanläggningar.

Genom att utforma sådana standarder blir säkerhetsfordringar tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

SEK är Sveriges röst i standardiseringsarbetet inom elområdet

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 62443-4-1

March 2018

ICS 25.040.40; 35.030

English Version

Security for industrial automation and control systems - Part 4-1: Secure product development lifecycle requirements (IEC 62443-4-1:2018)

To be completed
(IEC 62443-4-1:2018)

IT-Sicherheit für industrielle Automatisierungssysteme - Teil 4-1: Anforderungen an den Lebenszyklus für eine sichere Produktentwicklung
(IEC 62443-4-1:2018)

This European Standard was approved by CENELEC on 2018-02-19. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN IEC 62443-4-1:2018 E

European foreword

The text of document 65/685/FDIS, future edition 1 of IEC 62443-4-1, prepared by IEC/TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62443-4-1:2018.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2018-11-19
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2021-02-19

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 62443-4-1:2018 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 62740	NOTE	Harmonized as EN 62470.
IEC 61508 (series)	NOTE	Harmonized as EN 61508 (series).
ISO/IEC 27001	NOTE	Harmonized as EN ISO/IEC 27001.
ISO/IEC 27002	NOTE	Harmonized as EN ISO/IEC 27002.
ISO 9001	NOTE	Harmonized as EN ISO 9001.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

NOTE 1 Where 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.

Publication	Year	Title	EN/HD	Year
IEC 62443-2-4	2015	Security for industrial process measurement and control - Network and system security - Part 2-4: Certification of IACS supplier security policies and practices	-	-
+ A1	2017		-	-

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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SECURITY FOR INDUSTRIAL AUTOMATION AND CONTROL SYSTEMS –

Part 4-1: Secure product development lifecycle requirements

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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8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
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International Standard IEC 62443-4-1 has been prepared by IEC technical committee 65: Industrial-process measurement, control and automation.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
65/685/FDIS	65/688/RVD

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

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

A list of all parts in the IEC 62443 series, published under the general title *Security for industrial automation and control systems*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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

- 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 document is part of a series of standards that addresses the issue of security for industrial automation and control systems (IACS). This document describes product development life-cycle requirements related to cyber security for products intended for use in the industrial automation and control systems environment and provides guidance on how to meet the requirements described for each element.

This document has been developed in large part from the Secure Development Life-cycle Assessment (SDLA) Certification Requirements [26] [1] from the ISA Security Compliance Institute (ISCI). Note that the SDLA procedure was based on the following sources:

- ISO/IEC 15408-3 (Common Criteria) [18];
- Open Web Application Security Project (OWASP) Comprehensive, Lightweight Application Security Process (CLASP) [36];
- The Security Development Life-cycle by Michael Howard and Steve Lipner [43];
- IEC 61508 Functional safety of electrical/electronic/ programmable electronic safety-related systems [24], and
- RCTA DO-178B Software Considerations in Airborne Systems and Equipment Certification [28].

Therefore, all these sources can be considered contributing sources to this document.

This document is the part of the IEC 62443 series that contains security requirements for developers of any automation and control products where security is a concern.

Figure 1 illustrates the relationship of the different parts of IEC 62443 that were in existence or planned as of the date of circulation of this document. Those that are normatively referenced are included in the list of normative references in Clause 2, and those that are referenced for informational purposes or that are in development are listed in the Bibliography.

[1] Figures in square brackets refer to the bibliography.

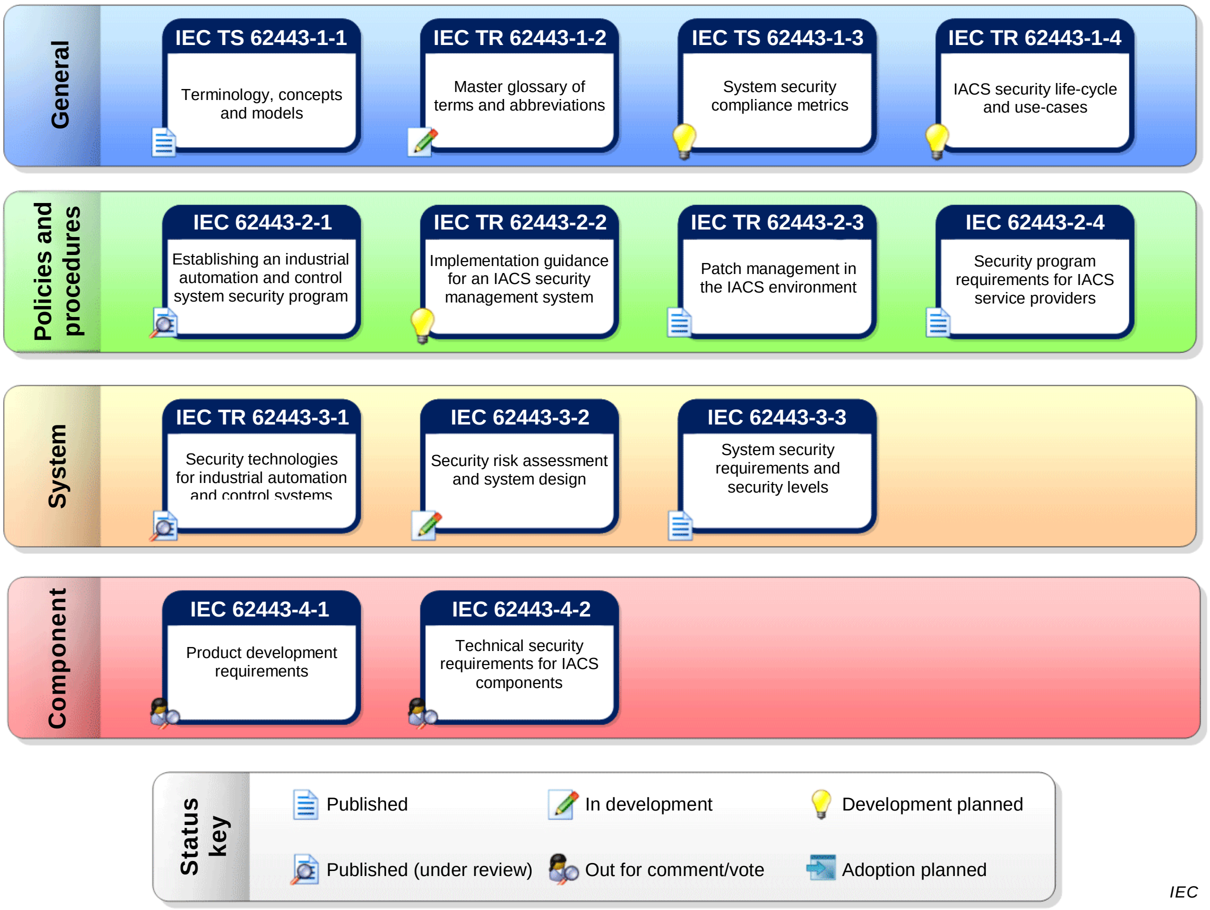
General
IEC TS 62443-1-1
Terminology, concepts and models
IEC TR 62443-1-2
Master glossary of terms and abbreviations
IEC TS 62443-1-3
System security compliance metrics
IEC TR 62443-1-4
IACS security life-cycle and use-cases
Policies and procedures
IEC 62443-2-1
Establishing an industrial automation and control system security program
IEC TR 62443-2-2
Implementation guidance for an IACS security management system
IEC TR 62443-2-3
Patch management in the IACS environment
IEC 62443-2-4
Security program requirements for IACS service providers
System
IEC TR 62443-3-1
Security technologies for industrial automation and control systems
IEC 62443-3-2
Security risk assessment and system design
IEC 62443-3-3
System security requirements and security levels
Component
IEC 62443-4-1
Product development requirements
IEC 62443-4-2
Technical security requirements for IACS components
Status key
Published
In development
Development planned
Published (under review)
Out for comment/vote
Adoption planned
IEC

Figure 1 – Parts of the IEC 62443 series

Figure 2 illustrates how the developed product relates to maintenance and integration capabilities defined in IEC 62443-2-4 and to its operation by the asset owner. The product supplier develops products using a process compliant with this document. Those products may be a single component, such as an embedded controller, or a group of components working together as a system or subsystem. The products are then integrated together, usually by a system integrator, into an Automation Solution using a process compliant with IEC 62443-2-4. The Automation Solution is then installed at a particular site and becomes part of the industrial automation and control system (IACS). Some of these capabilities reference security measures defined in IEC 62443-3-3 [10] that the service provider ensures are supported in the Automation Solution (either as product features or compensating mechanisms). This document only addresses the process used for the development of the product; it does not address design, installation or operation of the Automation Solution or IACS.

In Figure 2, the Automation Solution is illustrated to contain one or more subsystems and optional supporting components such as advanced control. The dashed boxes indicate that these components are "optional".

NOTE 1 Automation Solutions typically have a single product, but they are not restricted to do so. In some industries, there may be a hierarchical product structure. In general, the Automation Solution is the set of hardware and software, independent of product packaging, that is used to control a physical process (for example, continuous or manufacturing) as defined by the asset owner.

NOTE 2 If a service provider provides products used in the Automation Solution, then the service provider is fulfilling the role of product supplier in this diagram.

NOTE 3 If a service provider provides products used in the Automation Solution, then the service provider is fulfilling the role of product supplier in this diagram.

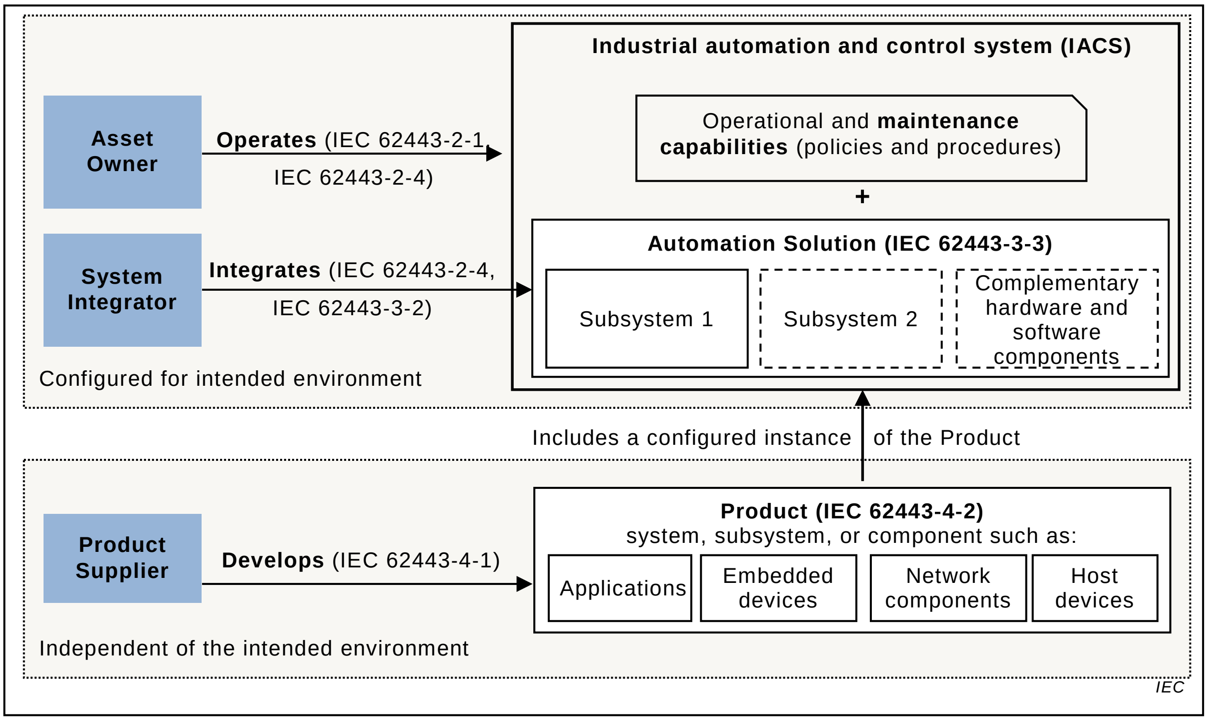
Industrial automation and control system (IACS)
Asset Owner
Operates (IEC 62443-2-1, IEC 62443-2-4)
Operational and maintenance capabilities (policies and procedures)
+
System Integrator
Integrates (IEC 62443-2-4, IEC 62443-3-2)
Automation Solution (IEC 62443-3-3)
Subsystem 1
Subsystem 2
Complementary hardware and software components
Configured for intended environment
Includes a configured instance of the Product
Product Supplier
Develops (IEC 62443-4-1)
Product (IEC 62443-4-2)
system, subsystem, or component such as:
Applications
Embedded devices
Network components
Host devices
Independent of the intended environment
IEC

Figure 2 – Example scope of product life-cycle

SECURITY FOR INDUSTRIAL AUTOMATION AND CONTROL SYSTEMS –

Part 4-1: Secure product development lifecycle requirements

1 Scope

This part of IEC 62443 specifies process requirements for the secure development of products used in industrial automation and control systems. It defines a secure development life-cycle (SDL) for the purpose of developing and maintaining secure products. This life-cycle includes security requirements definition, secure design, secure implementation (including coding guidelines), verification and validation, defect management, patch management and product end-of-life. These requirements can be applied to new or existing processes for developing, maintaining and retiring hardware, software or firmware for new or existing products. These requirements apply to the developer and maintainer of the product, but not to the integrator or user of the product. A summary list of the requirements in this document can be found in Annex B.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 62443-2-4:2015, *Security for industrial automation and control systems – Part 2-4: Security program requirements for IACS service providers*
IEC 62443-2-4:2015/AMD1:2017

[2] Under consideration.