TNI	**Nízkonapäťové spínacie a riadiace zariadenia** **Návod na vývoj vstavaného softvéru**	**TNI** **CLC IEC/TR 63201** 35 4101

Low-voltage switchgear and controlgear - Guidance for the development of embedded software

Táto technická normalizačná informácia obsahuje anglickú verziu CLC IEC/TR 63201:2020, IEC/TR 63201:2019.
This Technical standard information includes the English version of CLC IEC/TR 63201:2020, IEC/TR 63201:2019.

Táto technická normalizačná informácia bola oznámená vo Vestníku ÚNMS SR č. 11/20

TECHNICAL REPORT

RAPPORT TECHNIQUE

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CLC IEC/TR 63201

August 2020

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English Version

Low-voltage switchgear and controlgear - Guidance for the development of embedded software
(IEC/TR 63201:2019)

Appareillage à basse tension - Guide pour le développement du logiciel embarqué
(IEC/TR 63201:2019)

Niederspannungsschaltgeräte - Leitfaden für die Entwicklung von Firmware
(IEC/TR 63201:2019)

This Technical Report was approved by CENELEC on 2020-08-10.

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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. CLC IEC/TR 63201:2020 E

European foreword

This document (CLC IEC/TR 63201:2020) consists of the text of IEC/TR 63201:2019 prepared by SC 121A "Low-voltage switchgear and controlgear" of IEC/TC 121 "Switchgear and controlgear and their assemblies for low voltage".

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 Technical Report IEC/TR 63201:2019 was approved by CENELEC as a European Technical Report without any modification.

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

IEC 60880:2006	NOTE	Harmonized as EN 60880:2009 (not modified)
IEC 61508 (series)	NOTE	Harmonized as EN 61508 (series)
IEC 61508-3:2010	NOTE	Harmonized as EN 61508-3:2010 (not modified)
IEC 61508-4:2010	NOTE	Harmonized as EN 61508-4:2010 (not modified)
IEC 61508-7:2010	NOTE	Harmonized as EN 61508-7:2010 (not modified)
IEC 61511-1:2016	NOTE	Harmonized as EN 61511-1:2017 (not modified)
IEC 62061	NOTE	Harmonized as EN 62061
IEC 62443 (series)	NOTE	Harmonized as EN IEC 62443 (series)
ISO 13849-1:2015	NOTE	Harmonized as EN ISO 13849-1:2015 (not modified)

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
ISO/IEC 2382-1	1993	Information technology - Vocabulary -- Part 1: Fundamental terms	-	-

IEC TR 63201

TECHNICAL
REPORT

colour
inside

Low-voltage switchgear and controlgear – Guidance for the development of embedded software

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TECHNICAL
REPORT

colour
inside

Low-voltage switchgear and controlgear – Guidance for the development of embedded software

INTERNATIONAL

ELECTROTECHNICAL

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –
GUIDANCE FOR THE DEVELOPMENT OF EMBEDDED SOFTWARE

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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IEC TR 63201, which is a technical report, has been prepared by subcommittee 121A: Low-voltage switchgear and controlgear, of IEC technical committee 121: Switchgear and controlgear and their assemblies for low voltage.

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

Enquiry draft	Report on voting
121A/256/DTR	121A/287A/RVDTR

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

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

Programmable electronics are now being integrated within switchgear and controlgear. For example, soft-starters, electronic overload relays, circuit-breakers with electronic trip units, proximity switches with built in micro-controllers and some accessories such as extension modules and control panels are using programmable electronics with embedded software called firmware. This embedded software often supports the main functions (see 3.3) provided by the equipment such as overcurrent protection and other important functions, e.g. alarm detection from monitoring devices.

The integration of embedded software within switchgear and controlgear should not degrade the integrity of their main functions compared to purely electromechanical equipment. Therefore, a minimum set of standard requirements for embedded software is provided by this document.

This document takes into account the existing best practices for developing embedded software within safety functions for automation given by IEC 61508-3. Functional safety approach is mainly used in machinery, automotive, automation and process automation where safety functions are implemented with multiple components which should match a consistent level of integrity when combined. In other sectors, such as electric distribution and power control systems, key functions such as over-current release, residual current release, load monitoring, etc. should follow installation rules and coordination rules which are systematically safety and reliability related. Therefore, this document can be seen as providing the principles of the good practice given by IEC 61508-3.

This document is also intended to provide an up-to-date method with regards to the supplement SE of UL 489.

The intention of this document is to provide guidance about:

– risk assessment aspects in relation to embedded software;

– embedded software evaluation method;

– software architecture;

– basic coding rules;

– measures to control software errors;

– software verification and its relationship with the validation of the equipment or system.

In this document, the term "software" is used as a generalized term for embedded software.

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –
GUIDANCE FOR THE DEVELOPMENT OF EMBEDDED SOFTWARE

1 Scope

This document provides information, and recommended minimum requirements related to embedded software supporting the main functions of switchgear and controlgear during the whole lifecycle of the equipment. It includes also the parameterization aspects and basics about secure coding standards.

This document can be used in addition to product standard requirements when not already covered.

This document is appropriate for new development or major changes in existing equipment.

This document is not intended to cover the functional safety of control systems for machinery or for automation which are covered by IEC 62061, ISO 13849-1 and IEC 61508 (all parts), neither the cybersecurity risk which are covered by ISO 27005, and IEC 62443 (all parts). It gives only some example of secure coding rules.

NOTE   Future new publication IEC TS 63208[1] is under development for implementing embedded cybersecurity measures within switchgear and controlgear based on ISO 27005 and IEC 62443 (all parts).

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.

ISO/IEC 2382-1:1993, *Information technology – Vocabulary – Part 1: Fundamental terms*

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