TECHNICAL REPORT

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CLC IEC/TR 63201

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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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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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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".

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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
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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	-	-

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IEC TR 63201

Edition 1.0 2019-05

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



IEC TR 63201:2019-05(en)

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IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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

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

FOREWORD

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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.

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

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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.

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