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Energy efficiency through automation systems

(IEC Technical Report 62837:2013)

Denna tekniska rapport beskriver grunderna för energieffektivisering i med hjälp av industriell automation och tillhandahåller ett generellt tillvägagångssätt för detta, jämte några mer tillämpade exempel.

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Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven 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.

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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.

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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).

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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.

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

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INTRODUCTION

Energy efficiency has received an ever growing attention worldwide since it is considered a major lever to help secure a sustainable society in view of climate change, growing population and security of supply [1]¹. Additionally the sustainability and conservation of resources need to be considered. Automation is the enabler of measures, solutions and systems for demand/response and energy efficiency. In the context of this TR we will only consider energy efficiency. IEC and ISO have both identified energy efficiency as one of their main areas of activity.

The current focus of the Standard Development Organisations (SDO) is harmonised terminology, calculation methods, indicators, energy management systems and standards for assessment and ratings (e.g. for buildings and industrial plants). For this purpose IEC SMB Decision 128/20 “New initiatives for IEC” work endorsed the SMB Strategic Group 1 on Energy Efficiency and Renewable Energy. This strategic group has since then developed 34 recommendations for future work in different domains. The three following recommendations cover the area of automation:

- Recommendation #7: IEC/TC 2, SC 22G and TC 65 together with ISO/TC 184 should develop guidelines for the design and operation of energy efficient systems in the field of industrial automation and industrial process control from a system point of view.
- Recommendation #27: In order to support the optimisation of automation and production processes already during the planning phase of production systems, SG1 recommends that all relevant product TC/SC include key data in their components/devices standards that are vital for a priori simulation of the component/device behaviour in an intended production system, as such simulation leads to optimised processes from an energy efficiency perspective.
- Recommendation #28: In order to support the optimisation of automation and production processes already during the planning phase of production systems, SG1 recommends that TC 65 and its SCs consider the development of simulation tools from a system point of view, to allow a priori optimisation of automation and production processes on the factory floor in terms of energy efficiency.

In line with the recommendation #7, a workshop organized by the quoted committees and by SC 17B reached the consensus to create JWG 14, settled in TC 65, to cover the objectives and perform the tasks specified in the above mentioned recommendations. This document identifies a number of technology areas in the scope of various technical committees that need standardisation.

¹ Numbers in square brackets refer to the Bibliography.

ENERGY EFFICIENCY THROUGH AUTOMATION SYSTEMS

1 Scope

This Technical Report provides to the technical committees a framework for the development and adaptation of documents in order to improve energy efficiency in manufacturing, process control and industrial facility management.

2 Normative references

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.

IEC 62264 (all parts), *Enterprise-control system integration*

IEC 62264-1:2013, *Enterprise-control system integration – Part 1: Models and terminology*

ISO 20140-1:2013, *Automation systems and integration – Evaluating energy efficiency and other factors of manufacturing systems that influence the environment – Part 1: Overview and general principles*

ISO 22400-2, *Automation systems and integration – Key performance indicators for manufacturing operations management – Part 2: Definitions and descriptions*²

² To be published.