

RAUDTEEALASED RAKENDUSED. ENERGIAMÕÕTMISED
RONGIDES. OSA 5: VASTAVUSHINDAMINE

Railway applications - Energy measurement on board
trains - Part 5: Conformity assessment

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 50463-5:2017 sisaldab Euroopa standardi EN 50463-5:2017 ingliskeelset teksti.	This Estonian standard EVS-EN 50463-5:2017 consists of the English text of the European standard EN 50463-5:2017.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 06.10.2017.	Date of Availability of the European standard is 06.10.2017.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 45.060.10

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:

Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

Railway applications - Energy measurement on board trains - Part 5: Conformity assessment

Applications ferroviaires - Mesure d'énergie à bord des
trains - Partie 5 : Evaluation de la conformité

Bahnanwendungen - Energiemessung auf Bahnfahrzeugen
- Teil 5: Konformitätsbewertung

This European Standard was approved by CENELEC on 2017-05-08. 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.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents	Page
European foreword.....	4
Introduction.....	5
1 Scope.....	8
2 Normative references.....	8
3 Terms, definitions and abbreviations	8
3.1 Terms and definitions	8
3.2 Abbreviations.....	9
4 Conformity assessment approach	10
4.1 General	10
4.2 Situation of applicability.....	10
4.3 General Methodology.....	10
4.4 EMS Specific Methodology	12
4.4.1 General.....	12
4.4.2 EMS integration design review.....	12
4.4.3 EMS integration type test.....	12
4.4.4 EMS installation design review	12
4.4.5 EMS installation type test	12
4.4.6 EMS installation routine test	12
4.4.7 EMS periodic re-verification	12
4.4.8 Replacement of devices and ancillary components	12
5 Conformity assessment procedures	12
5.1 General	12
5.2 EMS integration design review	13
5.2.1 EMS integration design review documentation.....	13
5.2.2 EMS integration design review assessment.....	13
5.2.3 Integration Design Review Report (IDRR).....	13
5.3 EMS integration type test	14
5.3.1 General.....	14
5.3.2 Integration type test procedure.....	14
5.3.3 Integration type tests.....	14
5.3.4 Integration Type Test Report (ITTR)	15
5.4 EMS installation design review.....	15
5.4.1 EMS installation design review documentation	15
5.4.2 EMS installation design review assessment	15
5.4.3 Installation Design Review Report (SDRR)	16
5.5 EMS Installation type test.....	16
5.5.1 General.....	16
5.5.2 Installation procedure	16
5.5.3 Installation type test procedure	16

5.5.4	Installation type tests	17
5.5.5	Installation Type Test Report (STTR).....	17
5.6	EMS installation routine test	17
5.6.1	General.....	17
5.6.2	Installation routine test procedure.....	18
5.6.3	Routine tests	18
5.6.4	Installation Routine Test Report (IRTR).....	19
5.7	Periodic re-verification	19
5.7.1	Procedure	19
5.7.2	Re-verification Report (RVR)	20
5.8	Replacement of devices and ancillary components	20
5.8.1	General.....	20
5.8.2	Documentation.....	21
5.8.3	Item replacement conformity assessment.....	22
5.8.4	Software.....	22
5.8.5	Programmable parameters	22
5.8.6	Replacement report	22
Annex ZZ (informative) Relationship between this European Standard and the Essential Requirements of Directive 2008/57/EC		23
Bibliography		24

Figures

Figure 1	— EMS functional structure and dataflow diagram	7
Figure 2	— Methods of conformity assessment	11
Figure 3	— Overview of EMS installation routine test process	18
Figure 4	— Replacement of devices and ancillary components	21

European foreword

This document (EN 50463-5:2017) has been prepared by CLC/TC 9X “Electrical and electronic applications for railways”.

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2018-04-06
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2020-10-06

This document supersedes EN 50463-5:2012.

EN 50463-5:2017 includes the following significant technical changes with respect to EN 50463-5:2012:

- no technical changes introduced in document; only the introduction has been updated in order to keep consistency in the five parts of the revised version of the EN 50463 series.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

This document is Part 5 of the EN 50463 series which consists of the following parts, under the common title *Railway applications — Energy measurement on board trains*:

- *Part 1: General*;
- *Part 2: Energy measuring*;
- *Part 3: Data handling*;
- *Part 4: Communication*;
- *Part 5: Conformity assessment*.

This series of European Standards follows the functional guidelines description in EN ISO/IEC 17000:2004, Annex A “Principles of conformity assessment”, tailored to the Energy Measurement System (EMS).

The requirements for Energy Measurement Systems in the relevant Technical Specifications for Interoperability are supported by this series of European Standards.

Introduction

The Energy Measurement System provides measurement and data suitable for billing and may also be used for energy management, e.g. energy saving.

This series of European Standards uses the functional approach to describe the Energy Measurement System and on-ground Data Collection Service. These functions are implemented in one or more physical devices. The user of this Series of standards is free to choose the physical implementation arrangements.

a) Structure and main contents of the EN 50463 series:

This series of European Standards is divided into five parts. The titles and brief descriptions of each part are given below:

1) EN 50463-1 — General:

The scope of EN 50463-1 is the Energy Measurement System (EMS).

EN 50463-1 provides system level requirements for the complete EMS and common requirements for all devices implementing one or more functions of the EMS.

2) EN 50463-2 — Energy measuring:

The scope of EN 50463-2 is the Energy Measurement Function (EMF).

The EMF provides measurement of the consumed and regenerated active energy of a traction unit. If the traction unit is designed for use on AC traction systems, the EMF also provides measurement of reactive energy. The EMF provides the measured quantities via an interface to the Data Handling System.

The EMF consists of the three functions: Voltage Measurement Function, Current Measurement Function and Energy Calculation Function. For each of these functions, accuracy classes are specified and associated reference conditions are defined. This part also defines all specific requirements for all functions of the EMF.

The Voltage Measurement Function measures the voltage of the CL system and the Current Measurement Function measures the current taken from and returned to the CL system. These functions provide signal inputs to the Energy Calculation Function.

The Energy Calculation Function inputs the signals from the Current and Voltage Measurement Functions and calculates a set of values representing the consumed and regenerated energies. These values are transferred to the Data Handling System and are used in the creation of Compiled Energy Billing Data (CEBD).

The standard has been developed taking into account that in some applications, the EMF may be subjected to legal metrological control. All relevant metrological aspects are covered in this part of EN 50463.

EN 50463-2 also defines the conformity assessment of the EMF.

3) EN 50463-3 — Data handling:

The scope of EN 50463-3 is the Data Handling System (DHS) and the associated requirements of Data Collecting System (DCS).

The on board DHS receives, produces and stores data, ready for transmission to any authorized receiver of data on board or on ground. The main goal of the DHS is to produce Compiled Energy

Billing Data and transfer it on an interoperable basis to an on-ground Data Collecting System (DCS). The DHS can support other functionality on board or on-ground with data, as long as this does not conflict with the main goal.

The DCS on-ground receives Compiled Energy Billing Data and transfer it to settlement system.

EN 50463-3 also defines the conformity assessment of the DHS and for the transfer of CEBD to an on-ground Data Collecting System (DCS).

4) EN 50463-4 — Communication:

The scope of EN 50463-4 is the communication services.

This part of EN 50463 gives requirements and guidance regarding the data communication between the functions implemented within EMS as well as between such functions and other on board units where data are exchanged using a communications protocol stack over a dedicated physical interface or a shared network.

It includes the on board to ground communication service and covers the requirements necessary to support data transfer between DHS and DCS including the transfer of CEBD on an interoperable basis.

EN 50463-4 also defines the conformity assessment of the communications services.

5) EN 50463-5 — Conformity assessment:

The scope of EN 50463-5 is the conformity assessment procedures for the EMS.

EN 50463-5 also covers re-verification procedures and conformity assessment in the event of the replacement of a device of the EMS.

b) EMS functional structure and dataflow:

Figure 1 illustrates the functional structure of the EMS, the main sub-functions and the structure of the dataflow and is informative only. Only the main interfaces required by this standard are displayed by arrows.

Since the communication function is distributed throughout the EMS, it has been omitted for clarity. Not all interfaces are shown.

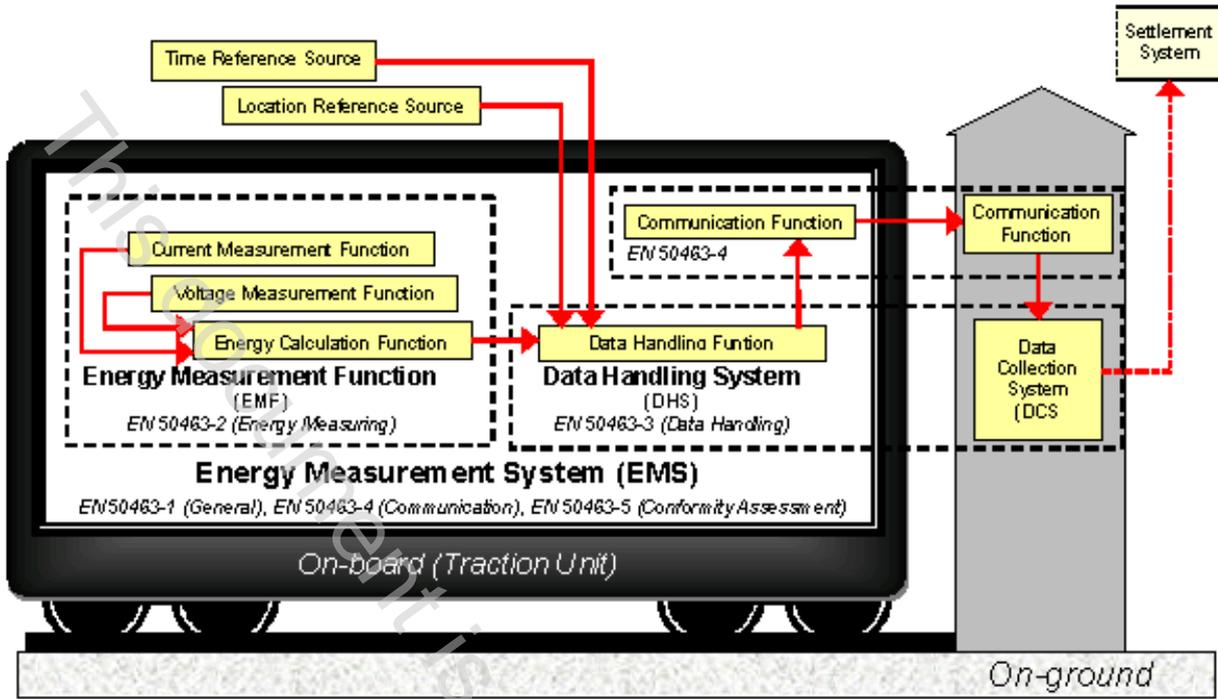


Figure 1 — EMS functional structure and dataflow diagram

1 Scope

This European Standard specifies the conformity assessment arrangements for newly manufactured EMS installed on a traction unit. This includes the integration conformity assessment and installation conformity assessment. In addition, this document also specifies the conformity assessment procedures for device and ancillary component replacement (e.g. due to damage in service), and periodic check to verify the EMS conformity assessment remains valid.

This European Standard does not include elements related to conformity assessment aspects other than design review and testing provisions for the products, processes or services specified. Consequently, this part does not delete, change or interpret the general requirements for conformity assessment procedures and vocabulary detailed in EN/ISO/IEC 17000.

This European Standard does not cover the conformity assessment schemes that, according to the CEN-CENELEC Internal Regulations, are the responsibility of ISO policy committee "Committee on conformity assessment" (ISO/CASCO).

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.

EN 50155:2017, *Railway applications — Rolling stock — Electronic equipment*

EN 50463-1:2017, *Railway applications — Energy measurement on board trains — Part 1: General*

EN 50463-2:2017, *Railway applications — Energy measurement on board trains — Part 2: Energy measuring*

EN 50463-3:2017, *Railway applications — Energy measurement on board trains — Part 3: Data handling*

EN 50463-4:2017, *Railway applications — Energy measurement on board trains — Part 4: Communication*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 50463-1:2017 and the following apply.

Note 1 to entry: When possible, the following definitions have been taken from the relevant chapters of the International Electrotechnical Vocabulary (IEV), the IEC 60050 series. In such cases, the appropriate IEV reference is given. Certain new definitions or modifications of IEV definitions have been added in this standard in order to facilitate understanding. Expression of the performance of electrical and electronic measuring equipment has been taken from EN 60359.

3.1.1

conformity assessment

demonstration that specified requirements are fulfilled

3.1.2

Conformity Assessment File

CAF

folder holding all documentation produced during conformity assessment