



NSAI
Standards

Irish Standard
I.S. EN 50463-3:2017

Railway applications - Energy measurement on board trains - Part 3: Data handling

I.S. EN 50463-3:2017

Incorporating amendments/corrigenda/National Annexes issued since publication:

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National Foreword

I.S. EN 50463-3:2017 is the adopted Irish version of the European Document EN 50463-3:2017, Railway applications - Energy measurement on board trains - Part 3: Data handling

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EUROPEAN STANDARD

EN 50463-3

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October 2017

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Supersedes EN 50463-3:2012

English Version

Railway applications - Energy measurement on board trains - Part 3: Data handling

Applications ferroviaires - Mesure d'énergie à bord des
trains - Partie 3 : Traitement des données

Bahnanwendungen - Energiemessung auf Bahnfahrzeugen
- Teil 3: Daten-Behandlung

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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.

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Contents

Page

| | |
|--|----|
| European foreword..... | 6 |
| Introduction..... | 7 |
| 1 Scope..... | 10 |
| 2 Normative references..... | 10 |
| 3 Terms, definitions and abbreviations | 10 |
| 3.1 Terms and definitions | 10 |
| 3.2 Abbreviations | 12 |
| 4 Requirements | 12 |
| 4.1 General | 12 |
| 4.2 Time data..... | 13 |
| 4.2.1 Source | 13 |
| 4.2.2 Reference time source | 13 |
| 4.2.3 Content..... | 13 |
| 4.2.4 Resolution..... | 13 |
| 4.2.5 Stability | 13 |
| 4.2.6 Synchronization | 13 |
| 4.2.7 Quality code for time data..... | 13 |
| 4.3 Energy data..... | 14 |
| 4.3.1 Source | 14 |
| 4.3.2 Type..... | 14 |
| 4.3.3 Format | 14 |
| 4.3.4 Index value overrun | 14 |
| 4.3.5 Merging with time data | 14 |
| 4.3.6 Quality codes for energy data | 14 |
| 4.3.7 k-factor | 15 |
| 4.3.8 Accuracy | 15 |
| 4.3.9 Transmission from EMF | 15 |
| 4.4 Location data | 15 |
| 4.4.1 Source | 15 |
| 4.4.2 Format | 16 |
| 4.4.3 Merging with time data | 16 |
| 4.4.4 Accuracy | 16 |
| 4.4.5 Quality codes for location data | 16 |

| | | |
|-------------|--|-----------|
| 4.5 | Other received or produced data..... | 17 |
| 4.5.1 | Types..... | 17 |
| 4.5.2 | Data handling prioritization | 17 |
| 4.5.3 | Time tag | 17 |
| 4.6 | Consumption point ID (CPID)..... | 17 |
| 4.7 | Production of CEBD..... | 17 |
| 4.7.1 | General..... | 17 |
| 4.7.2 | Type of Data..... | 17 |
| 4.7.3 | Time Reference Period | 17 |
| 4.7.4 | Energy data..... | 18 |
| 4.7.5 | Location data..... | 18 |
| 4.7.6 | Missing input data | 18 |
| 4.7.7 | Data integrity | 18 |
| 4.7.8 | Quality codes..... | 19 |
| 4.7.9 | Traction system code | 19 |
| 4.8 | DHS data storage | 19 |
| 4.8.1 | Storage periods..... | 19 |
| 4.8.2 | Memory Capacity | 19 |
| 4.9 | Transmission of CEBD from DHS to DCS..... | 20 |
| 4.9.1 | General..... | 20 |
| 4.9.2 | Type of info..... | 20 |
| 4.9.3 | Time between each transfer..... | 20 |
| 4.9.4 | Binding to a DCS..... | 20 |
| 4.10 | Marking and essential information..... | 20 |
| 4.10.1 | Marking of the DHS..... | 20 |
| 4.10.2 | Essential information | 20 |
| 4.11 | Event recording | 21 |
| 4.11.1 | General..... | 21 |
| 4.11.2 | Type of events | 21 |
| 4.12 | DCS..... | 22 |
| 4.12.1 | General..... | 22 |
| 4.12.2 | Reception of CEBD from DHS | 22 |
| 4.12.3 | Request to DHS for CEBD data | 22 |
| 4.12.4 | Storage of CEBD | 22 |
| 4.12.5 | Export of CEBD from DCS | 22 |
| 4.12.6 | Binding the communication with the EMS..... | 22 |
| 4.12.7 | EMS discovery..... | 22 |

EN 50463-3:2017 (E)

| | | |
|------------|--|-----------|
| 5 | Conformity assessment | 22 |
| 5.1 | General | 22 |
| 5.1.1 | Introduction | 22 |
| 5.1.2 | Applicability | 23 |
| 5.1.3 | Methodology | 23 |
| 5.2 | Testing framework | 23 |
| 5.2.1 | General | 23 |
| 5.2.2 | Reporting | 24 |
| 5.3 | Design review | 25 |
| 5.3.1 | General | 25 |
| 5.3.2 | Interfaces | 25 |
| 5.3.3 | Access control | 25 |
| 5.3.4 | Software | 25 |
| 5.3.5 | RAMS | 25 |
| 5.3.6 | Internal clock | 25 |
| 5.3.7 | Location data source | 25 |
| 5.3.8 | DHS priorities | 25 |
| 5.3.9 | Transmission of CEBD to DCS | 25 |
| 5.3.10 | Dataflow security | 25 |
| 5.3.11 | Event logs | 26 |
| 5.4 | Type testing | 26 |
| 5.4.1 | General | 26 |
| 5.4.2 | Visual inspection | 26 |
| 5.4.3 | Environmental testing | 26 |
| 5.4.4 | Mechanical testing | 27 |
| 5.4.5 | Electrical testing | 27 |
| 5.4.6 | Access control | 28 |
| 5.4.7 | Interfaces | 29 |
| 5.4.8 | Functional testing | 29 |
| 5.5 | Routine testing | 35 |
| 5.5.1 | General | 35 |
| 5.5.2 | Visual inspection | 35 |
| 5.5.3 | Check of marking | 35 |
| 5.5.4 | Functional testing | 35 |
| 5.5.5 | Insulation test | 35 |
| 5.6 | DCS conformity assessment | 35 |
| 5.6.1 | General | 35 |

| | | |
|--|--------------------------|-----------|
| 5.6.2 | Design review | 35 |
| 5.6.3 | Functional Testing | 35 |
| Annex ZZ (informative) Relationship between this European Standard and the Essential Requirements of Directive 2008/57/EC | | 37 |
| Bibliography | | 38 |
| | | |
| Figures | | |
| Figure 1 — EMS functional structure and dataflow diagram | | 9 |
| Figure 2 — Example of energy index value | | 11 |
| | | |
| Tables | | |
| Table 1 — Time data quality codes | | 13 |
| Table 2 — Energy data quality codes | | 15 |
| Table 3 — Location data format | | 16 |
| Table 4 — Location data quality codes | | 16 |
| Table 5 — Traction system codes | | 19 |
| Table ZZ.1 — Correspondence between this European Standard, the TSI “Locomotives and Passenger Rolling Stock” (REGULATION (EU) No 1302/2014 of 18 November 2014) and Directive 2008/57/EC amended by Directive 2011/18/EU | | 37 |
| Table ZZ.2 — Correspondence between this European Standard, the TSI “Energy” (REGULATION (EU) No 1301/2014 of 18 November 2014) and Directive 2008/57/EC amended by Directive 2011/18/EU | | 37 |

EN 50463-3:2017 (E)**European foreword**

This document (EN 50463-3:2017) 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 50463-3:2012.

EN 50463-3 includes the following significant technical changes with respect to EN 50463-3:2012:

- updated requirements for DCS, CEBD, quality codes and logs (Clause 4).

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.

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 3 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 railway 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. EN 50463-2 also defines all specific requirements for all functions of the EMF.

The Voltage Measurement Function measures the voltage of the Contact Line system and the Current Measurement Function measures the current taken from and returned to the Contact Line 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 EN 50463-2.

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).

EN 50463-3:2017 (E)

The on board DHS receives, produces and stores data, ready for transmission to any authorized receiver of data onboard or on ground. The main goal of the DHS is to produce Compiled Energy Billing Data (CEBD) and transfer it to an on ground Data Collecting System (DCS). The DHS can support other functionality on board or on ground with data (e.g. for energy management, driver advisory systems, etc.), 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 reference to 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 widely omitted for clarity, except for the train to ground communication. Not all interfaces are shown.

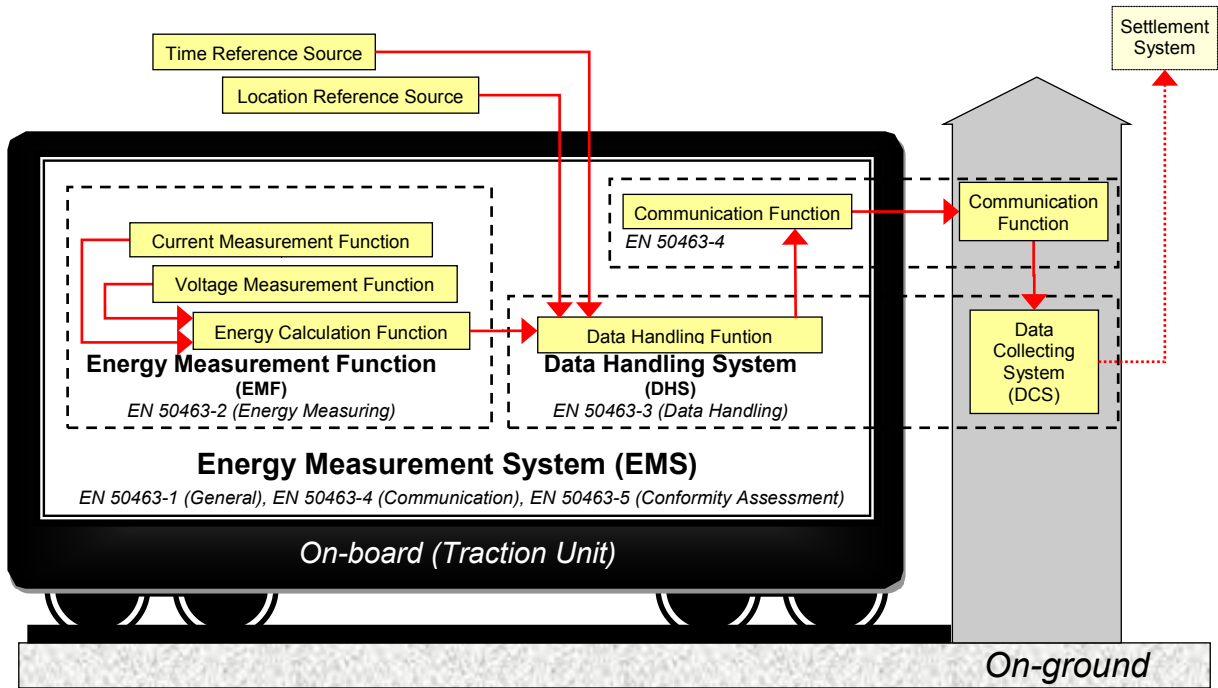


Figure 1 — EMS functional structure and dataflow diagram

EN 50463-3:2017 (E)

1 Scope

This European Standard covers the requirements applicable to the Data Handling System (DHS) of an Energy Measurement System (EMS).

This document also includes the basic requirements for the Data Collecting System (DCS) on-ground, relating to the acquisition and storage and export of Compiled Energy Billing Data (CEBD).

The Conformity Assessment arrangements for the DHS and the DCS are specified in this document.

The settlement system is outside the scope of this standard, and the specification of the interface between DCS and settlement system is outside the scope of this standard.

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 45545-2:2013+A1:2015, *Railway applications — Fire protection on railway vehicles — Part 2: Requirements for fire behaviour of materials and components*

EN 45545-5:2013+A1:2015, *Railway applications — Fire protection on railway vehicles — Part 5: Fire safety requirements for electrical equipment including that of trolley buses, track guided buses and magnetic levitation vehicles*

EN 50121-3-2:2015, *Railway applications — Electromagnetic compatibility — Part 3-2: Rolling stock — Apparatus*

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

EN 50463-5:2017, *Railway applications — Energy measurement on board trains — Part 5: Conformity assessment*

EN 60529:1991, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

EN 61373:2010, *Railway applications — Rolling stock equipment — Shock and vibration tests (IEC 61373:2010)*

World Geodetic System, revision WGS 84

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 and the following apply.

NOTE When possible, the following definitions have been taken from the relevant chapters of the International Electrotechnical Vocabulary (IEV), IEC 60050–311, IEC 60050–312, IEC 60050–313, IEC 60050–314, IEC 60050–321 and IEC 60050–811. In such cases, the appropriate IEV reference is given. Certain new definitions or

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