

<b>STN</b>	<b>Veterné turbíny. Časť 25-2: Komunikácia pre monitorovanie a riadenie veterných elektrární. Informačné modely.</b>	<b>STN EN 61400-25-2</b>  33 3160
------------	--	---

Wind turbines - Part 25-2: Communications for monitoring and control of wind power plants - Information models

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 03/16

Obsahuje: EN 61400-25-2:2015, IEC 61400-25-2:2015

Oznámením tejto normy sa od 04.08.2018 ruší  
STN EN 61400-25-2 (33 3160) zo septembra 2007

**122550**

---

Úrad pre normalizáciu, metrológiu a skúšobníctvo SR, 2016  
Podľa zákona č. 264/1999 Z. z. v znení neskorších predpisov sa môžu slovenské technické normy  
rozmnožovať a rozširovať iba so súhlasom Úradu pre normalizáciu, metrológiu a skúšobníctvo SR.

EUROPEAN STANDARD

**EN 61400-25-2**

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2015

ICS 27.180

Supersedes EN 61400-25-2:2007

English Version

**Wind turbines - Part 25-2: Communications for monitoring and control of wind power plants - Information models  
(IEC 61400-25-2:2015)**

Eoliennes - Partie 25-2: Communications pour la surveillance et la commande des centrales éoliennes -  
Modèles d'information  
(IEC 61400-25-2:2015)

Windenergieanlagen - Teil 25-2: Kommunikation für die Überwachung und Steuerung von Windenergieanlagen -  
Informationsmodelle  
(IEC 61400-25-2:2015)

This European Standard was approved by CENELEC on 2015-08-04. 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, 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**

## European foreword

The text of document 88/539/FDIS, future edition 2 of IEC 61400-25-2, prepared by IEC TC 88 "Wind turbines" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61400-25-2:2015.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2016-05-20
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-08-04

This document supersedes EN 61400-25-2:2007.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

## Endorsement notice

The text of the International Standard IEC 61400-25-2:2015 was approved by CENELEC as a European Standard without any modification.

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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.

NOTE 1 When 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](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61400-25-1	-	Wind turbines -- Part 25-1: Communications for monitoring and control of wind power plants - Overall description of principles and models	EN 61400-25-1	-
IEC 61400-25	series	Wind turbines	EN 61400-25	series
IEC 61400-25-3	2015	Wind turbines -- Part 25-3: Communications for monitoring and control of wind power plants - Information exchange models	FprEN 61400-25-3	2015
IEC 61400-25-4	-		-	-
IEC 61850-5	-	Communication networks and systems for power utility automation -- Part 5: Communication requirements for functions and device models	EN 61850-5	-
IEC 61850-7-1	2011	Communication networks and systems for power utility automation -- Part 7-1: Basic communication structure - Principles and models	EN 61850-7-1	2011
IEC 61850-7-2	2010	Communication networks and systems for power utility automation -- Part 7-2: Basic information and communication structure - Abstract communication service interface (ACSI)	EN 61850-7-2	2010
IEC 61850-7-3	2010	Communication networks and systems for power utility automation -- Part 7-3: Basic communication structure - Common data classes	EN 61850-7-3	2011
IEC 61850-7-4	2010	Communication networks and systems for power utility automation -- Part 7-4: Basic communication structure - Compatible logical node classes and data object classes	EN 61850-7-4	2010
ISO 639	series	Codes for the representation of names of languages	-	series
ISO 3166	series	Codes for the representation of names of countries and their subdivisions	-	series
ISO 80000-1	-	Quantities and units -- Part 1: General	EN ISO 80000-1	-
IEC/TS 61400-26-1	2011	Wind turbines - Part 26-1: Time-based availability for wind turbine generating systems	-	-
IEEE 754	-	IEEE Standard for Binary Floating-Point Arithmetic	-	-



# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Wind turbines –  
Part 25-2: Communications for monitoring and control of wind power plants –  
Information models**

**Eoliennes –  
Partie 25-2: Communications pour la surveillance et la commande des centrales  
éoliennes – Modèles d'information**





**THIS PUBLICATION IS COPYRIGHT PROTECTED**  
**Copyright © 2015 IEC, Geneva, Switzerland**

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

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

Tel.: +41 22 919 02 11  
 Fax: +41 22 919 03 00  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

#### About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

#### About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

#### IEC Catalogue - [webstore.iec.ch/catalogue](http://webstore.iec.ch/catalogue)

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

#### IEC publications search - [www.iec.ch/searchpub](http://www.iec.ch/searchpub)

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in 15 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

#### IEC Glossary - [std.iec.ch/glossary](http://std.iec.ch/glossary)

More than 60 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

#### IEC Customer Service Centre - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: [csc@iec.ch](mailto:csc@iec.ch).

#### A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

#### A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

#### Catalogue IEC - [webstore.iec.ch/catalogue](http://webstore.iec.ch/catalogue)

Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

#### Recherche de publications IEC - [www.iec.ch/searchpub](http://www.iec.ch/searchpub)

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient plus de 30 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 15 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

#### Glossaire IEC - [std.iec.ch/glossary](http://std.iec.ch/glossary)

Plus de 60 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

#### Service Clients - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: [csc@iec.ch](mailto:csc@iec.ch).



# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



---

## Wind turbines –

## Part 25-2: Communications for monitoring and control of wind power plants – Information models

## Eoliennes –

## Partie 25-2: Communications pour la surveillance et la commande des centrales éoliennes – Modèles d'information

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

---

ICS 27.180

ISBN 978-2-8322-2726-8

**Warning! Make sure that you obtained this publication from an authorized distributor.  
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

## CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references.....	10
3 Terms and definitions .....	12
4 Abbreviated terms .....	12
5 General.....	15
5.1 Overview of logical node classes .....	15
5.2 Use of logical node classes .....	17
5.3 Extensions of the information model .....	18
6 Wind power plant logical node classes .....	18
6.1 System specific logical nodes .....	18
6.1.1 Wind power plant common logical node class .....	18
6.1.2 LN: Logical node zero Name: LLN0 .....	20
6.1.3 LN: Physical device information Name: LPHD .....	20
6.2 Wind power plant specific logical nodes .....	21
6.2.1 LN: Wind power plant general information Name: WPPD.....	21
6.2.2 LN: Wind turbine general information Name: WTUR.....	22
6.2.3 LN: Wind turbine rotor information Name: WROT .....	22
6.2.4 LN: Wind turbine transmission information Name: WTRM.....	23
6.2.5 LN: Wind turbine generator information Name: WGEN .....	24
6.2.6 LN: Wind turbine converter information Name: WCNV.....	25
6.2.7 LN: Wind turbine transformer information Name: WTRF .....	26
6.2.8 LN: Wind turbine nacelle information Name: WNAC .....	27
6.2.9 LN: Wind turbine yawing information Name: WYAW .....	28
6.2.10 LN: Wind turbine tower information Name: WTOW .....	29
6.2.11 LN: Wind power plant meteorological information Name: WMET.....	30
6.2.12 LN: Wind power plant alarm information Name: WALM.....	31
6.2.13 LN: Wind turbine availability information Name: WAVL.....	31
6.2.14 LN: Wind power plant active power control Name: WAPC.....	32
6.2.15 LN: Wind power plant reactive power control Name: WRPC .....	33
6.3 Data name semantic.....	34
7 Common data classes.....	47
7.1 Basic concepts for common data classes (CDC) .....	47
7.1.1 Categories of common data classes .....	47
7.1.2 Structure of common data classes .....	48
7.2 Type definitions.....	50
7.2.1 General .....	50
7.2.2 BasicTypes .....	50
7.2.3 CommonACSITypes .....	50
7.2.4 ConstructedAttributeClasses .....	51
7.2.5 Originator .....	54
7.3 Wind power plant specific common data classes (CDC).....	55
7.3.1 General .....	55
7.3.2 Setpoint value (SPV).....	56
7.3.3 Status Value (STV) .....	58



7.3.4	Alarm (ALM) .....	58
7.3.5	Command (CMD) .....	60
7.3.6	Event counting (CTE).....	61
7.3.7	State timing (TMS).....	63
7.3.8	Alarm Set Status (AST).....	65
7.4	Common data classes inherited from IEC 61850-7-3 .....	65
7.4.1	CDCs from IEC 61850-7-3 (unchanged).....	65
7.4.2	CDCs from IEC 61850-7-3 (specialised) .....	66
7.5	Common data class attribute semantics .....	68
Annex A (informative) Information model for statistical data and historical statistical data.....		73
A.1	General.....	73
A.2	Model for statistical and historical statistical data .....	73
A.3	Logical node extension for statistical data.....	76
A.3.1	Data for calculation method for analogue and statistical analogue values.....	76
A.3.2	Data name semantics.....	76
A.4	Common data class for statistical data.....	78
A.4.1	Object reference setting group common data class (ORG) .....	78
Annex B (normative) Value range for units and multiplier .....		80
Annex C (normative) Logical nodes for state log, analogue log and report information .....		83
C.1	LN: Wind turbine state log information Name: WSLG.....	83
C.2	LN: Wind turbine analogue log information Name: WALG .....	85
C.3	LN: Wind turbine report information Name: WREP .....	88
Annex D (informative) Wind power plant controller.....		90
D.1	General.....	90
D.2	Active power control functions .....	91
D.3	Reactive power control functions .....	94
Annex E (informative) List of mandatory logical nodes and data .....		97
E.1	General.....	97
Annex F (informative) Control authority management.....		99
F.1	General.....	99
F.2	Functional description .....	99
F.2.1	Local mode .....	99
F.2.2	Local mode at station level.....	99
F.3	Logical Node representation .....	100
F.3.1	Local mode .....	100
F.3.2	Diagram description .....	100
F.4	Local mode at station level .....	101
F.4.1	General .....	101
F.4.2	Diagram description .....	101
Figure 1 – Conceptual communication model of the IEC 61400-25 series .....		10
Figure 2 – Relationship of logical nodes .....		15
Figure 3 – Use of instances of logical nodes.....		18
Figure A.1 – Conceptual model of statistical and historical statistical data (1).....		74
Figure A.2 – Conceptual model of statistical and historical statistical data (2).....		75

Figure D.1 – Conceptual structure of the wind power plant control functions.....	90
Figure D.2 – Schematic illustration of the active power limitation control function .....	91
Figure D.3 – Schematic illustration of the gradient power control function .....	92
Figure D.4 – Schematic illustration of the delta power control function .....	92
Figure D.5 – Schematic illustration of a combined control – including gradient, delta and active power limitation control .....	93
Figure D.6 – Schematic illustration of the apparent power control function .....	93
Figure D.7 – Schematic illustration of the reactive power control function.....	94
Figure D.8 – Schematic illustration of the power factor control function .....	95
Figure D.9 – Schematic illustration of the voltage control function using reactive power control.....	96
Figure F.1 – Local mode .....	100
Figure F.2 – Local mode at station level .....	101
Table 1 – System specific logical nodes .....	15
Table 2 – Wind power plant general logical nodes .....	16
Table 3 – Logical nodes for modelling a wind turbine .....	16
Table 4 – Logical nodes for modelling a non-turbine device .....	17
Table 5 – Wind power plant common logical node class.....	19
Table 6 – Logical node zero class .....	20
Table 7 – Physical device information class.....	21
Table 8 – LN: Wind power plant general information (WPPD).....	21
Table 9 – LN: Wind turbine general information (WTUR).....	22
Table 10 – LN: Wind turbine rotor information (WROT) .....	23
Table 11 – LN: Wind turbine transmission information (WTRM).....	24
Table 12 – LN: Wind turbine generator information (WGEN).....	25
Table 13 – LN: Wind turbine converter information (WCNV) .....	26
Table 14 – LN: Wind turbine transformer information (WTRF) .....	27
Table 15 – LN: Wind turbine nacelle information (WNAC) .....	28
Table 16 – LN: Wind turbine yawing information (WYAW) .....	29
Table 17 – LN: Wind turbine tower information (WTOW) .....	29
Table 18 – LN: Wind power plant meteorological information (WMET).....	30
Table 19 – LN: Wind power plant alarm information (WALM).....	31
Table 20 – LN: Wind turbine availability (WAVL).....	32
Table 21 – LN: Wind power plant active power control information (WAPC).....	33
Table 22 – LN: Wind power plant reactive power control information (WRPC).....	34
Table 23 – Data name semantic .....	35
Table 24 – General table structure of a common data class (CDC).....	48
Table 25 – Common data class attributes .....	49
Table 26 – Conditions for the presence of an attribute .....	49
Table 27 – Basic types.....	50
Table 28 – AnalogueValue .....	51
Table 29 – TimeStamp type .....	52
Table 30 – TimeQuality definition .....	53

Table 31 – TimeAccuracy.....	53
Table 32 – Quality .....	54
Table 33 – Unit .....	54
Table 34 – Originator .....	55
Table 35 – Values for orCat .....	55
Table 36 – Wind power plant specific common data classes.....	56
Table 37 – CDC: Setpoint value (SPV) .....	57
Table 38 – CDC: Status Value (STV).....	58
Table 39 – CDC: Alarm (ALM).....	59
Table 40 – CDC: Command (CMD).....	61
Table 41 – CDC: Event counting (CTE) .....	62
Table 42 – CDC: State timing (TMS) .....	64
Table 43 – CDC: Alarm Set Status (AST) .....	65
Table 44 – Specialized common data classes.....	66
Table 45 – Wind power plant device name plate common data class specification WDPL.....	67
Table 46 – Common data class attribute semantic .....	68
Table A.1 – Description of Data.....	77
Table A.2 – Object reference setting group common data class specification.....	78
Table B.1 – SI units: base units.....	80
Table B.2 – SI units: derived units.....	80
Table B.3 – SI units: extended units .....	81
Table B.4 – SI units: industry specific units.....	81
Table B.5 – Multiplier .....	82
Table C.1 – LN: Wind turbine state log information (WSLG) .....	84
Table C.2 – LN: Wind turbine analogue log information (WALG).....	86
Table C.3 – LN: Wind turbine report information (WREP) .....	89
Table E.1 – Mandatory system specific logical nodes.....	97
Table E.2 – Mandatory wind turbine specific logical nodes .....	97
Table E.3 – Mandatory wind power plant specific common data classes (CDC) .....	97
Table E.4 – Mandatory common data classes inherited from IEC 61850-7-3.....	97
Table E.5 – Mandatory common data classes inherited from IEC 61850-7-3 and specialised .....	98

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## WIND TURBINES –

**Part 25-2: Communications for monitoring and control of wind power plants – Information models**

## 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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61400-25-2 has been prepared by IEC technical committee 88: Wind turbines.

The text of this standard is based on the following documents:

FDIS	Report on voting
88/539FDIS	88/551/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

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

The scope of revision includes:

- harmonization with Common Data Classes in Edition 2 of IEC 61850-7-3,
- harmonization with Logical node classes in Edition 2 of IEC 61850-7-4,
- harmonization with Information models in IEC 61850-7-410 and IEC 61850-7-420,
- reduction of overlap between standards and simplification by increased referencing,
- extension of Data objects for operation of smart grids (in US and other areas),
- extended and enhanced semantics for existing data objects,

and includes the following significant technical changes with respect to the previous edition:

- a) The model on alarm handling has been revised and the logical node WALM and associated cdc's have been modified.
- b) A new logical node class WPPD that represents general data for non-turbine devices has been added.
- c) A new logical node class WAVL that represents availability data has been added.
- d) WMET has been revised and harmonized with MMET. If MMET is extended with data object for altitude and ice then WMET may be deleted in future editions.
- e) External Met sensors (WndDir, WndSpd, Humidity, Pressure, Temperature) have been removed from WNAC and moved to WMET.
- f) Some data types, such as CtxInt, are not supported by IEC 61850 so other data types need to be used.
- g) Abbreviations have been changed to resolve inconsistencies with IEC 61850. This affects several data names.
- h) Enumeration values and definitions in the standard have been harmonized.
- i) Additional data objects regarding smart grid have been added.
- j) Wind power specific CDCs that in Edition 1 contained subsets of attributes of CDCs from IEC 61850-7-3 now implicitly include all attributes of these CDCs.
- k) Technical issues related to IEC 61400-25-2:2006 have been resolved and results incorporated in the standard.
- l) The presence conditions for statistical information has been modified compared to IEC 61850-7-4:2010.

This second edition cancels and replaces the first edition published in 2006. This edition constitutes a technical revision.

A list of all parts of the IEC 61400 series, under the general title *Wind turbines*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

**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

The IEC 61400-25 series defines communication for monitoring and control of wind power plants. The modeling approach of the IEC 61400-25 series has been selected to provide abstract definitions of classes and services such that the specifications are independent of specific protocol stacks, implementations, and operating systems. The mapping of these abstract classes and services to a specific communication profile is not within the scope of this part of the IEC 61400-25 series but within the scope of IEC 61400-25-4.

To reach interoperability, all data in the information model need a strong definition with regard to syntax and semantics. The semantics of the data are mainly provided by names assigned to logical nodes and data they contain, as defined in this part of the IEC 61400-25 series. Interoperability is easiest if as many as possible of the data are defined as mandatory.

It should be noted that data with full semantics is only one of the elements required to achieve interoperability. Since data and services are hosted by intelligent electronic devices (IED), a proper device model is needed along with compatible domain specific services (see IEC 61400-25-3).

This part is used to specify the abstract definitions of a logical device class, logical node classes, data classes, and abstract common data classes. These abstract definitions are mapped into concrete object definitions that are to be used for a particular protocol.

The compatible logical node name, data object name and data attribute name definitions found in this part and the associated semantics are fixed.

NOTE 1 Performance of the IEC 61400-25 series implementations is application-specific. The IEC 61400-25 series does not guarantee a certain level of performance. This is beyond the scope of the IEC 61400-25 series. However, there is no underlying limitation in the communications technology to prevent high-speed application (millisecond level responses).

NOTE 2 Authorisation processes using PKI, role based access control as e.g. defined in the IEC 62351 series of standards or other security and access safety methods are beyond the scope of this standard.

## WIND TURBINES –

### Part 25-2: Communications for monitoring and control of wind power plants – Information models

#### 1 Scope

The focus of the IEC 61400-25 series is on the communications between wind power plant components such as wind turbines and actors such as SCADA systems. Internal communication within wind power plant components is outside the scope of the IEC 61400-25 series.

The IEC 61400-25 series is designed for a communication environment supported by a client-server model. Three areas are defined, that are modelled separately to ensure the scalability of implementations:

- 1) wind power plant information models,
- 2) information exchange model, and
- 3) mapping of these two models to a standard communication profile.

The wind power plant information model and the information exchange model, viewed together, constitute an interface between client and server. In this conjunction, the wind power plant information model serves as an interpretation frame for accessible wind power plant data. The wind power plant information model is used by the server to offer the client a uniform, component-oriented view of the wind power plant data. The information exchange model reflects the whole active functionality of the server. The IEC 61400-25 series enables connectivity between a heterogeneous combination of client and servers from different manufacturers and suppliers.

As depicted in Figure 1, the IEC 61400-25 series defines a server with the following aspects:

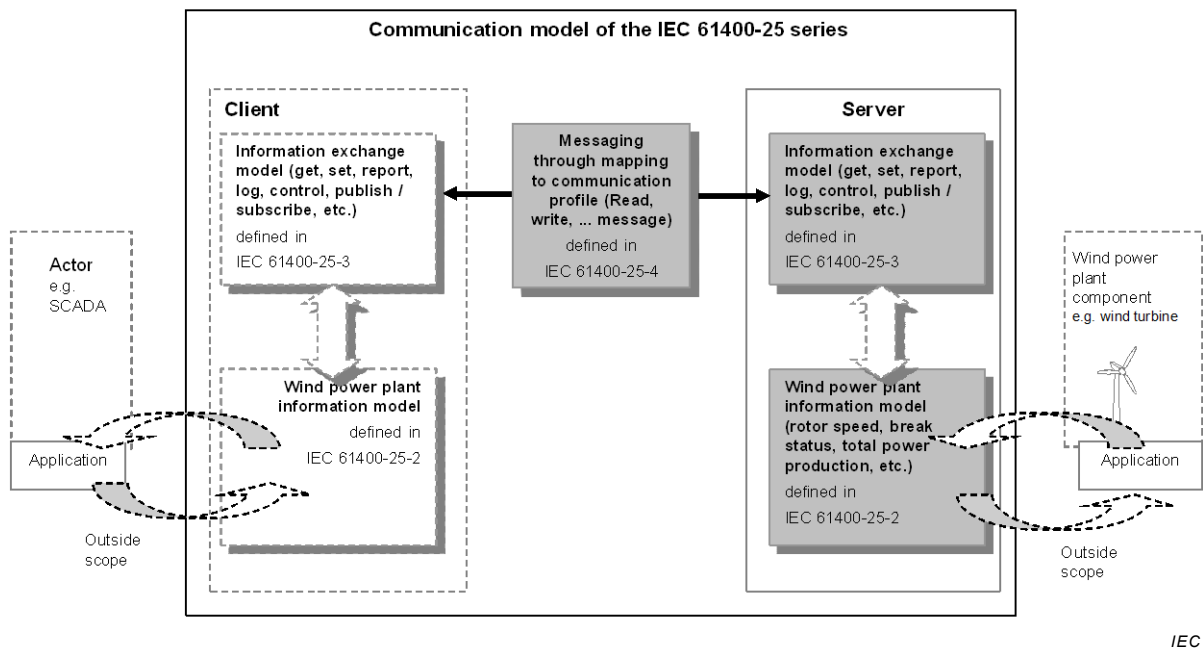
- information provided by a wind power plant component, for example “wind turbine rotor speed” or “total power production of a certain time interval”, is modelled and made available for access;
- services to exchange values of the modelled information defined in IEC 61400-25-3;
- mapping to a communication profile, providing a protocol stack, to carry the exchanged values from the modelled information (IEC 61400-25-4).

The IEC 61400-25 series only defines how to model the information, information exchange and mapping to specific communication protocols. The standard excludes a definition of how and where to implement the communication interface, the application program interface and implementation recommendations. However, the objective of the standard is that the information associated with a single wind power plant component (such as a wind turbine) is accessible through a corresponding logical device.

IEC 61400-25-2 specifies the information model of devices and functions related to wind power plant applications. In particular, it specifies the compatible logical node names, and data names for communication between wind power plant components. This includes the relationship between logical devices, logical nodes and data. The names defined in the IEC 61400-25 series are used to build the hierarchical object references applied for communicating with components in wind power plants.

This part of IEC 61400-25 specifies common attribute types and common data classes related to wind turbine applications. In particular it specifies common data classes for:

- setpoint value,
- status value,
- alarm,
- command,
- event counting,
- state timing,
- alarm set status.



IEC

**Figure 1 – Conceptual communication model of the IEC 61400-25 series**

Devices implementing the information model of this part choose one or more logical nodes as required by the application.

NOTE 1 The IEC 61400-25 series focuses on the common, non-vendor-specific information. Those information items that tend to vary greatly between vendor-specific implementations can for example be specified in bilateral agreements or by user groups.

NOTE 2 This part does not provide tutorial material.

## 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 61400-25 (all parts), *Wind turbines – Part 25: Communications for monitoring and control of wind power plants*

IEC 61400-25-1, *Wind turbines – Part 25-1: Communications for monitoring and control of wind power plants – Overall description of principles and models*



IEC 61400-25-3:2015, *Wind turbines – Part 25-3: Communications for monitoring and control of wind power plants – Information exchange models*

IEC 61400-25-4:\_\_\_<sup>1</sup>, *Wind turbines – Part 25-4: Communications for monitoring and control of wind power plants – Mapping to communication profile*

IEC TS 61400-26-1:2011, *Wind turbines – Part 26-1: Time-based availability for wind turbine generating systems*

IEC 61850-5, *Communication networks and systems for power utility automation – Part 5: Communication requirements for functions and device models*

IEC 61850-7-1:2011, *Communication networks and systems for power utility automation – Part 7-1: Basic communication structure – Principles and models*

IEC 61850-7-2:2010, *Communication networks and systems for power utility automation – Part 7-2: Basic information and communication structure – Abstract communication service interface (ACSI)*

IEC 61850-7-3:2010, *Communication networks and systems for power utility automation – Part 7-3: Basic communication structure – Common data classes*

IEC 61850-7-4:2010, *Communication networks and systems for power utility automation – Part 7-4: Basic communication structure – Compatible logical node classes and data object classes*

ISO 639 (all parts), *Codes for the representation of names of languages*

ISO 80000-1, *Quantities and units – Part 1: General*

ISO 3166 (all parts), *Codes for the representation of names of countries and their subdivisions*

IEEE 754, *Standard for Binary Floating-Point Arithmetic*

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**

---

<sup>1</sup> To be published.