



NSAI
Standards

Irish Standard
I.S. EN 61400-25-3:2015

Wind turbines - Part 25-3: Communications for monitoring and control of wind power plants - Information exchange models

I.S. EN 61400-25-3:2015

Incorporating amendments/corrigenda/National Annexes issued since publication:

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This document is based on:

EN 61400-25-3:2015

Published:

2015-11-20

*This document was published
under the authority of the NSAI
and comes into effect on:*

2015-12-08

ICS number:

27.180

NOTE: If blank see CEN/CENELEC cover page

NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie
W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

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National Foreword

I.S. EN 61400-25-3:2015 is the adopted Irish version of the European Document EN 61400-25-3:2015, Wind turbines - Part 25-3: Communications for monitoring and control of wind power plants - Information exchange models

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EUROPEAN STANDARD

EN 61400-25-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2015

ICS 27.180

Supersedes EN 61400-25-3:2007

English Version

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

Eoliennes - Partie 25-3: Communications pour la
surveillance et la commande des centrales éoliennes -
Modèles d'échange d'information
(IEC 61400-25-3:2015)

Windenergieanlagen - Teil 25 3: Kommunikation für die
Überwachung und Steuerung von Windenergieanlagen -
Dienste-Modelle für den Informationsaustausch
(IEC 61400-25-3:2015)

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Europäisches Komitee für Elektrotechnische Normung

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

EN 61400-25-3:2015

European foreword

The text of document 88/540/FDIS, future edition 2 of IEC 61400-25-3, prepared by IEC TC 88 "Wind turbines" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61400-25-3:2015.

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- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-08-04

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61850-7-3	NOTE	Harmonized as EN 61850-7-3.
IEC 61850-7-4	NOTE	Harmonized as EN 61850-7-4.

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:
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<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 61400-25-2	2015	Wind turbines -- Part 25-2: Communications for monitoring and control of wind power plants - Information models	EN 61400-25-2	2015
IEC 61400-25-4	2008	Wind turbines -- Part 25-4: Communications for monitoring and control of wind power plants - Mapping to communication profile	EN 61400-25-4	2008
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

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IEC 61400-25-3

Edition 2.0 2015-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Wind turbines –

**Part 25-3: Communications for monitoring and control of wind power plants –
Information exchange models**

Eoliennes –

**Partie 25-3: Communications pour la surveillance et la commande des centrales
éoliennes – Modèles d'échange d'information**



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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
www.iec.ch

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IEC 61400-25-3

Edition 2.0 2015-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Wind turbines –

Part 25-3: Communications for monitoring and control of wind power plants – Information exchange models

Eoliennes –

Partie 25-3: Communications pour la surveillance et la commande des centrales éoliennes – Modèles d'échange d'information

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 27.180

ISBN 978-2-8322-2722-0

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WIND TURBINES –

**Part 25-3: Communications for monitoring
and control of wind power plants –
Information exchange models**

FOREWORD

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International Standard IEC 61400-25-3 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
88/540/FDIS	88/552/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.

This second edition cancels and replaces the first edition published in 2006.

The scope of revision includes:

- Harmonization with service models in Edition 2 of IEC 61850-7-2.
- Reduction of overlap between standards and simplification by increased referencing.

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

- a) Add subscription and remove subscription services have been removed.
- b) Tables in Clause 9 indicating expected services have been replaced by tables in a new Annex D including ACSI conformance statements for clients and servers.
- c) Technical issues ("Tissues") for IEC 61850-7-2 edition 2 have been considered and changes have been made accordingly.

Technical issues ("Tissues"), as collected by the IEC 61400-25 users group USE61400-25, have been considered, but no technical issues were registered for edition 1.

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

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INTRODUCTION

The IEC 61400-25 series defines communications 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 inside the scope of this part (IEC 61400-25-3) but inside the scope of IEC 61400-25-4.

This part of IEC 61400-25 defines services of the model of the information exchange of intelligent electronic devices in wind power plants. The services are referred to as the abstract communication service interface (ACSI). The ACSI has been defined so as to be independent of the underlying communication systems.

The information exchange model is defined in terms of

- a hierarchical class model of all information that can be accessed,
- information exchange services that operate on these classes,
- parameters associated with each information exchange service.

The ACSI description technique abstracts away from all the different approaches to implement the cooperation of the various devices.

These abstract service definitions are mapped into concrete object definitions that are to be used for a particular protocol. Mapping to specific protocol stacks is specified in IEC 61400-25-4.

NOTE 1 Abstraction in ACSI has two meanings. Firstly, only those aspects of a real device (for example, a rotor) or a real function that are visible and accessible over a communication network are modelled. This abstraction leads to the hierarchical class models and their behaviour defined in IEC 61400-25-2. Secondly, the ACSI abstracts from the aspect of concrete definitions on how the devices exchange information; only a conceptual cooperation is defined. The concrete information exchange is defined in IEC 61400-25-4.

NOTE 2 Performance of the IEC 61400-25 series implementations are 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).

WIND TURBINES –

Part 25-3: Communications for monitoring and control of wind power plants – Information exchange 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, e. g., “wind turbine rotor speed” or “total power production of a certain time interval” is modelled and made available for access. The information modelled in the IEC 61400-25 series is defined in IEC 61400-25-2;
- 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 IEC 61400-25 series excludes a definition of how and where to implement the communication interface, the application program interface and implementation recommendations. However, the objective of the IEC 61400-25 series is that the information associated with a single wind power plant component (such as a wind turbine) is accessible through a corresponding logical device.

This part of IEC 61400-25 specifies an abstract communication service interface describing the information exchange between a client and a server for:

- data access and retrieval,
- device control,
- event reporting and logging,
- self-description of devices (device data dictionary),
- data typing and discovery of data types.

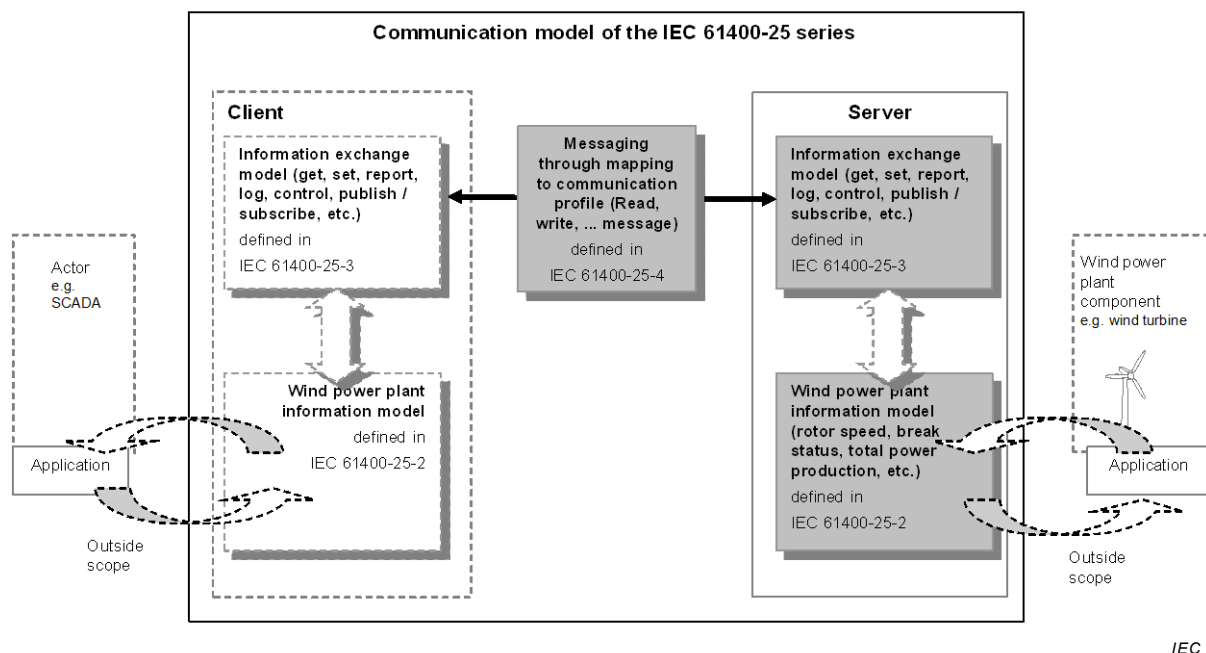


Figure 1 – Conceptual communication model of the IEC 61400-25 series

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

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

IEC 61400-25-4:2008, *Wind turbines – Part 25-4: Communications for monitoring and control of wind power plants – Mapping to communication profile*

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)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61400-25-1 as well as the following apply.

3.1

control object

data object instance of a controllable data object class whose `ctlModel DataAttribute` is not set to “status-only”

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