IEC 61400-25-1

Edition 2.0 2017-07

REDLINE VERSION

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Wind ~~turbines~~ energy generation systems – Part 25-1: Communications for monitoring and control of wind power plants – Overall description of principles and models

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 27.180

ISBN 978-2-8322-4656-6

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WIND ~~TURBINES~~ ENERGY GENERATION SYSTEMS –

Part 25-1: Communications for monitoring and control of wind power plants – Overall description of principles and models

FOREWORD

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DISCLAIMER
This Redline version is not an official IEC Standard and is intended only to provide the user with an indication of what changes have been made to the previous version. Only the current version of the standard is to be considered the official document.

This Redline version provides you with a quick and easy way to compare all the changes between this standard and its previous edition. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International Standard IEC 61400-25-1 has been prepared by IEC technical committee 88: Wind energy generation systems.

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

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

a) general harmonization of text and overview models with the other parts of the IEC 61400-25 series,
b) harmonization of definitions in other related standards.

The text of this International Standard is based on the following documents:

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Attached to the release of the IEC 61400-25 standard series and in addition to the standard IEC maintenance process, a specific maintenance process is set up to handle technical issues raised after publication. Here are the main principles:

- Technical issues (called TISSUES) are collected from the release of the new document in cooperation with the user group for the IEC 61400-25 standard series USE61400-25.
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  - TISSUES that propose new features that will be implemented in future versions of the standard (“next edition” TISSUES).
- IntOp TISSUES require immediate clarification and are following a transparent fixing process handled by the user group for the IEC 61400-25 standard series together with the editors of the IEC 61400-25 standard series.
- The detailed specification of this process, the list of TISSUES, associated fix, their status and impact on implementation and certification are accessible through the USE61400-25 web site http://www.use61400-25.com.
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- amended.

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INTRODUCTION

IEC 61400-25 (all parts) ~~addresses~~ is intended for vendors (manufacturers, suppliers), operators, owners, planners, and designers of wind power plants as well as system integrators and utility companies operating in the wind energy market. IEC 61400-25 (all parts) is intended to be accepted and to be used world-wide as the international standard for communications in the domain of wind power plants.

IEC 61400-25 (all parts) has been developed in order to provide a uniform communications basis for the monitoring and control of wind power plants. It defines wind power plant specific information, the mechanisms for information exchange and the mapping to communication protocols. In this regard, IEC 61400-25 (all parts) defines details required to exchange the available information with wind power plant components in a manufacturer-independent environment. This is done by definitions made in this part of IEC 61400-25 or by reference to other standards.

The wind power plant specific information describes the crucial and common process and configuration information. The information is hierarchically structured and covers for example common information found in the rotor, generator, converter, grid connection and the like. The information may be simple data (including timestamp and quality) and configuration values or more comprehensive attributes and descriptive information, for example engineering unit, scale, description, reference, statistical or historical information. All information of a wind power plant defined in IEC 61400-25 (all parts) is name tagged. A concise meaning of each data is given. The standardized wind power plant information can be extended by means of a name space extension rule. All data, attributes and descriptive information can be exchanged by corresponding services.

The implementation of IEC 61400-25 (all parts) allows SCADA systems (supervisory control and data acquisition) to communicate with wind turbines from multiple vendors. The standardized self-description (contained either in an XML file or retrieved online from a device) can be used to configure SCADA applications. Standardization of SCADA applications are excluded in IEC 61400-25 (all parts) but standardized common wind turbine information provides means for re-use of applications and operator screens for wind turbines from different vendors. From a utility perspective, unified definitions of common data minimize conversion and re-calculation of data values for evaluation and comparison of all their wind power plants.

IEC 61400-25 (all parts) can be applied to any wind power plant operation concept, i.e. both individual wind turbines, clusters and more integrated groups of wind turbines. The application area of IEC 61400-25 (all parts) covers components required for the operation of wind power plants, i.e. not only the wind turbine generator, but also the meteorological system, the electrical system, and the wind power plant management system. The wind power plant specific information in IEC 61400-25 (all parts) excludes information associated with feeders and substations. Substation communication is covered within IEC 61850 (all parts).

The intention of IEC 61400-25 (all parts) is to enable components from different vendors to communicate with other components, at any location. Object-oriented data structures can make the engineering and handling of large amounts of information provided by wind power plants less time-consuming and more efficient. IEC 61400-25 (all parts) supports scalability, connectivity, and interoperability.

IEC 61400-25 (all parts) is a basis for simplifying the contracting of the roles the wind turbine and SCADA systems have to play. The crucial part of the wind power plant information, the information exchange methods, and the communication stacks are standardized. They build a basis to which procurement specifications and contracts could easily refer.

IEC 61400-25 is organized in several parts.

- IEC 61400-25-1 offers an introductory orientation, crucial requirements, and a modelling guide.
- IEC 61400-25-2 and IEC61400-25-6 contain the description of the information model, a uniform, component-oriented view of the wind power plant data, including extensions for condition monitoring.
- IEC 61400-25-3 describes the information exchange model. It reflects the functionality of the server.
- IEC 61400-25-4 presents five alternative mappings of the information model and information exchange model to a standard communication profile. The choice depends on the application and the functionality and performance needed.
- IEC 61400-25-5 describes test cases for conformance testing of implementations.

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

~~NOTE 2 IEC 61400-25-4 is, at the time of the publication of IEC 61400-25-1 (this part), still to be published. With IEC 61400-25-4 the mapping of the information and information exchange models to a specific communication profile will be described/defined in detail. IEC 61400-25-4 may consist of more than one normative mapping but at least one of the optional mappings has to be selected in order to be in conformance with the IEC 61400-25 series. IEC 61400-25-4 is expected to include the following mappings:~~

~~Webservices~~

~~IEC 61850-8-1 MMS~~

~~OPC XML DA~~

~~IEC 60870-5-104~~

~~DNP3~~

~~Each of the different mappings specifies individually which and how information models (IEC 61400-25-2) and information exchange models (IEC 61400-25-3) will be supported. The mapping will only reflect the information model and the information exchange services given in IEC 61400-25-2 and IEC 61400-25-3. The individual selected mapping will as a minimum support the mandatory data and data attributes, and the associated services. A specific mapping may, for implementation reasons or due to underlying properties of the communication protocol used, need to extend and clarify individual information or individual services in IEC 61400-25-2 and IEC 61400-25-3. IEC 61400-25-4 will in this sense have the highest priority of the ranking order in regards of implementation.~~

WIND ~~TURBINES~~ ENERGY GENERATION SYSTEMS –

Part 25-1: Communications for monitoring and control of wind power plants – Overall description of principles and models

1 Scope

The focus of IEC 61400-25 (all parts) 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 beyond the scope of IEC 61400-25 (all parts).

IEC 61400-25 (all parts) 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. IEC 61400-25 (all parts) enables connectivity between a heterogeneous combination of client and servers from different manufacturers and suppliers.

As depicted in Figure 1, IEC 61400-25 (all parts) 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. The information modelled in IEC 61400-25 (all parts) is defined in IEC 61400-25-2 and IEC 61400-25-6,
– 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).

IEC 61400-25 (all parts) only defines how to model the information, information exchange and mapping to specific communication protocols. IEC 61400-25 (all parts) excludes a definition of how and where to implement the communication interface, the application program interface and implementation recommendations. However, the objective of IEC 61400-25 (all parts) 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 gives an overall description of the principles and models used in IEC 61400-25 (all parts).

NOTE IEC 61400-25 (all parts) 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, in user groups, or in amendments to IEC 61400-25 (all parts).

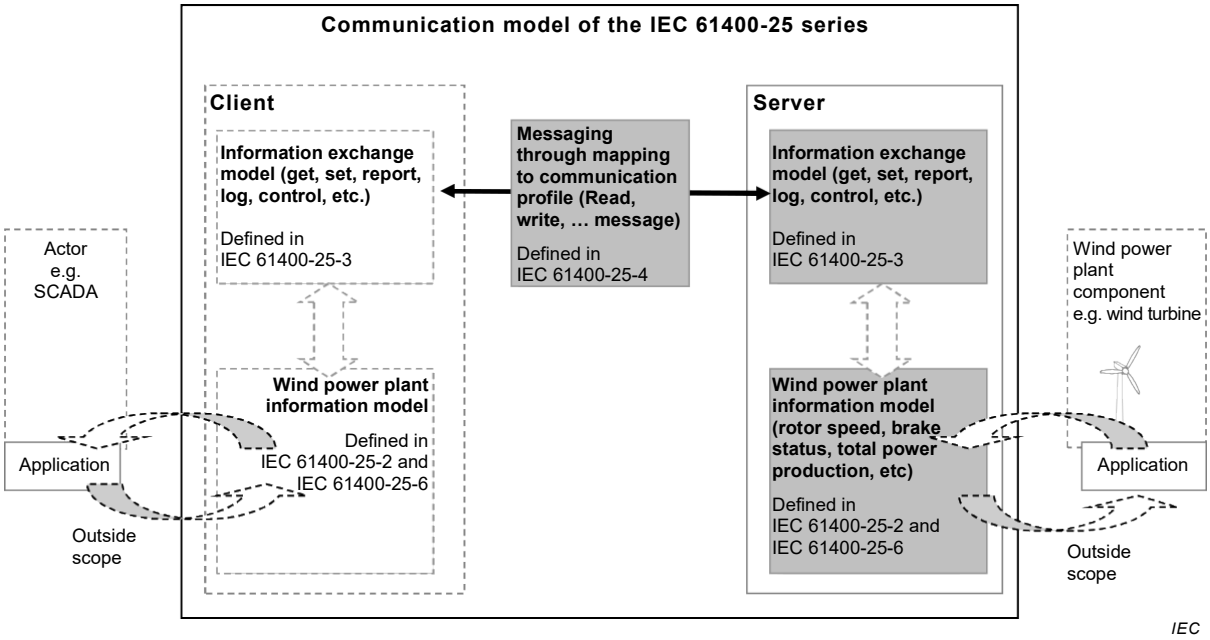


Figure 1 – Conceptual communication model of the IEC 61400-25 series

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

~~IEC 61400-12-1, *Wind turbines – Part 12-1: Power performance measurements of electricity producing wind turbines*~~

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

IEC 61400-25-2:2015, *Wind turbines – Part 25-2: Communications for monitoring and control of wind power plants – Information 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, *Wind energy generation systems – Part 25-4: Communications for monitoring and control of wind power plants – Mapping to communication profile*

IEC 61400-25-6, *Wind energy generation systems – Part 25-6: Communications for monitoring and control of wind power plants – Logical node classes and data classes for condition monitoring*

IEC 61850-7-1:~~2003~~ 2011, *Communication networks and systems ~~in substations~~ for power utility automation – Part 7-1: Basic communication structure ~~for substation and feeder equipment~~ – Principles and models*

IEC 61850-7-2:~~2003~~ 2010, *Communication networks and systems ~~in substations~~ for power utility automation – Part 7-2: Basic information and communication structure ~~for substation and feeder equipment~~ – Abstract communication service interface (ACSI)*

~~IEC 61850-7-3:2003, *Communication networks and systems in substations – Part 7-3: Basic communication structure for substation and feeder equipment – Common data classes*~~

~~IEC 61850-7-4:2003, *Communication networks and systems in substations – Part 7-4: Basic communication structure for substation and feeder equipment – Compatible logical node classes and data classes*~~

~~IEC 61850-8-1:2004, *Communication networks and systems in substations – Part 8-1: Specific Communication Service Mapping (SCSM) – Mappings to MMS (ISO 9506-1 and ISO 9506-2) and to ISO/IEC 8802-3*~~

~~ISO 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The Basic Model*~~

IEC 61400-25-1

Edition 2.0 2017-07

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Systèmes de génération d'énergie éolienne – Partie 25-1: Communications pour la surveillance et la commande des centrales éoliennes – Description globale des principes et des modèles



IEC 61400-25-1:2017-07(en-fr)

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- IEC 61400-25-4 presents five alternative mappings of the information model and information exchange model to a standard communication profile. The choice depends on the application and the functionality and performance needed.
- IEC 61400-25-5 describes test cases for conformance testing of implementations.

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

WIND ENERGY GENERATION SYSTEMS –

Part 25-1: Communications for monitoring and control of wind power plants – Overall description of principles and models

1 Scope

The focus of IEC 61400-25 (all parts) 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 beyond the scope of IEC 61400-25 (all parts).

IEC 61400-25 (all parts) 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. IEC 61400-25 (all parts) enables connectivity between a heterogeneous combination of client and servers from different manufacturers and suppliers.

As depicted in Figure 1, IEC 61400-25 (all parts) 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. The information modelled in IEC 61400-25 (all parts) is defined in IEC 61400-25-2 and IEC 61400-25-6,
– 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).

IEC 61400-25 (all parts) only defines how to model the information, information exchange and mapping to specific communication protocols. IEC 61400-25 (all parts) excludes a definition of how and where to implement the communication interface, the application program interface and implementation recommendations. However, the objective of IEC 61400-25 (all parts) 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 gives an overall description of the principles and models used in IEC 61400-25 (all parts).

NOTE IEC 61400-25 (all parts) 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, in user groups, or in amendments to IEC 61400-25 (all parts).

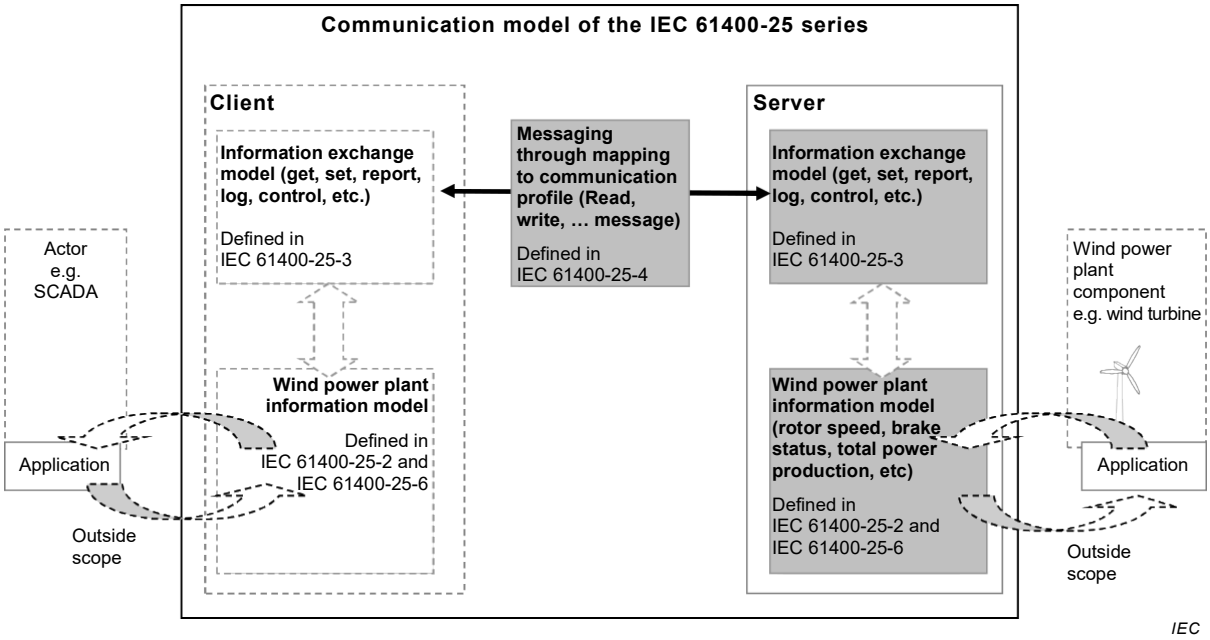


Figure 1 – Conceptual communication model of the IEC 61400-25 series

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. 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 61400-25-2:2015, *Wind turbines – Part 25-2: Communications for monitoring and control of wind power plants – Information 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, *Wind energy generation systems – Part 25-4: Communications for monitoring and control of wind power plants – Mapping to communication profile*

IEC 61400-25-6, *Wind energy generation systems – Part 25-6: Communications for monitoring and control of wind power plants – Logical node classes and data classes for condition monitoring*

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)*

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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SYSTÈMES DE GÉNÉRATION D'ÉNERGIE ÉOLIENNE –

Partie 25-1: Communications pour la surveillance et la commande des centrales éoliennes – Description globale des principes et des modèles

AVANT-PROPOS

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La Norme internationale IEC 61400-25-1 a été établie par le comité d'études 88 de l'IEC: Systèmes de génération d'énergie éolienne.

Cette deuxième édition annule et remplace la première édition parue en 2006. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

a) harmonisation générale du texte et des modèles présentés avec les autres parties de la série IEC 61400-25,
b) harmonisation des définitions des autres normes connexes.

Le texte de cette Norme internationale est issu des documents suivants:

CDV	Rapport de vote
88/587/CDV	88/622/RVC

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette norme.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

Le titre du comité d'études 88 qui était *Éoliennes* est devenu *Systèmes de génération d'énergie éolienne* en 2015.

Une liste de toutes les parties de la série IEC 61400, publiées sous les titres généraux *Éoliennes et Systèmes de génération d'énergie éolienne*, peut être consultée sur le site web de l'IEC.

Les utilisateurs de l'IEC 61400-25 forment une communauté, appelée USE61400-25. Pour de plus amples informations, voir http://www.use61400-25.com.

Il existe un processus spécifique de maintenance lié à la série IEC 61400-25 qui complète le processus de maintenance normalisé de l'IEC afin de gérer les problèmes techniques survenant après la publication. Voici les principes essentiels de ce processus:

- Les problèmes techniques (appelés TISSUES – technical issues) sont rassemblés à partir de la publication du nouveau document en coopération avec le groupe d'utilisateurs USE61400-25 de la série IEC 61400-25.
- Les TISSUES rassemblés peuvent être classés en deux groupes:
  - TISSUES pouvant compromettre l'interopérabilité entre les mises en œuvre de la norme et nécessitant des corrections ou des clarifications (TISSUES «IntOp»),
  - TISSUES proposant de nouvelles caractéristiques qui seront mises en œuvre dans les versions futures de la norme (TISSUES «next edition»).
- Les TISSUES IntOp exigent une clarification immédiate et suivent un processus de résolution de problème transparent géré par le groupe d'utilisateurs de la série IEC 61400-25 avec les éditeurs de la série IEC 61400-25.
- La spécification détaillée de ce processus, la liste des TISSUES, la solution associée, leur statut et leur impact sur la mise en œuvre et la certification sont accessibles via le site web de l'USE61400-25, sous http://www.use61400-25.com.
- L'IEC recommande la mise en œuvre des solutions proposées pour les TISSUES IntOp dès qu'ils ont atteint l'état «green» (vert). Il convient que la liste des TISSUES mis en œuvre dans un dispositif électronique intelligent (IED) soit indiquée en toute transparence par son constructeur.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "http://webstore.iec.ch" dans les données relatives au document recherché. A cette date, le document sera

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- supprimé,
- remplacé par une édition révisée, ou
- amendé.

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INTRODUCTION

L'IEC 61400-25 (toutes les parties) s'adresse aux fournisseurs (constructeurs, fournisseurs), opérateurs, propriétaires, planificateurs et concepteurs de centrales éoliennes ainsi qu'aux intégrateurs système et aux entreprises publiques opérant sur le marché de l'énergie éolienne. L'IEC 61400-25 (toutes les parties) est destinée à être reconnue et utilisée dans le monde entier comme norme internationale relative aux communications dans le domaine des centrales éoliennes.

L'IEC 61400-25 (toutes les parties) a été élaborée afin de fournir des principes de communication uniformes servant de base pour la surveillance et le contrôle des centrales éoliennes. Elle spécifie des informations spécifiques aux centrales éoliennes ainsi que les mécanismes d'échange d'information et le mapping aux protocoles de communication. À cet égard, l'IEC 61400-25 (toutes les parties) définit les détails exigés pour l'échange des informations disponibles avec les composants de centrales éoliennes dans un environnement indépendant du constructeur. Cela est réalisé par les définitions données dans la présente partie de l'IEC 61400-25 ou par des références à d'autres normes.

Les informations spécifiques aux centrales éoliennes décrivent le processus essentiel et commun ainsi que les informations relatives à la configuration des centrales. Les informations sont structurées de manière hiérarchique et couvrent, par exemple, les informations communes relatives au rotor, au générateur, au convertisseur, à la connexion réseau et aux éléments similaires. Les informations peuvent être de simples données (y compris l'horodatage et la qualité) et des valeurs de configuration ou des attributs plus complets et des informations descriptives, par exemple l'unité d'ingénierie, l'échelle, la description, la référence et les informations statistiques ou historiques. Le nom de toutes les informations d'une centrale éolienne définies dans l'IEC 61400-25 (toutes les parties) est renseigné. Une brève description de la signification de chaque donnée est fournie. Les informations normalisées relatives aux centrales éoliennes peuvent être étendues au moyen d'une règle d'extension d'espace de noms. Toutes les données, tous les attributs et toutes les informations descriptives peuvent être échangés par le biais de services correspondants.

La mise en œuvre de l'IEC 61400-25 (toutes les parties) permet aux systèmes SCADA (systèmes de supervision, contrôle et acquisition de données) de communiquer avec les éoliennes de plusieurs fournisseurs. L'autodescription normalisée (contenue dans un fichier XML ou récupérée en ligne à l'aide d'un dispositif adapté) peut être utilisée pour configurer les applications SCADA. La normalisation des applications SCADA est exclue de l'IEC 61400-25 (toutes les parties), mais les informations normalisées communes relatives aux éoliennes fournissent des moyens de réutiliser les applications et les écrans opérateur des éoliennes de plusieurs fournisseurs. Du point de vue des entreprises publiques, les définitions unifiées des données communes réduisent de manière notable la conversion et le recalcul des valeurs des données pour l'évaluation et la comparaison de toutes leurs centrales éoliennes.

L'IEC 61400-25 (toutes les parties) peut être appliquée à tout concept de fonctionnement de centrale éolienne, c'est-à-dire à des éoliennes individuelles, à des parcs éoliens et à d'autres groupes intégrés d'éoliennes. Le domaine d'application de l'IEC 61400-25 (toutes les parties) couvre les composants exigés pour le fonctionnement des centrales éoliennes, c'est-à-dire non seulement le générateur éolien mais également le système météorologique, le système électrique et le système de gestion des centrales éoliennes. Les informations spécifiques aux centrales éoliennes de l'IEC 61400-25 (toutes les parties) ne comprennent pas les informations associées aux artères et aux postes. La communication des postes est traitée dans l'IEC 61850 (toutes les parties).

L'IEC 61400-25 (toutes les parties) a pour objet de permettre aux composants provenant de différents fournisseurs de communiquer avec d'autres composants, quel que soit leur emplacement. Les structures de données orientées objet peuvent rendre moins chronophages et plus efficaces l'ingénierie et la manipulation de grandes quantités d'informations fournies par les centrales éoliennes. L'IEC 61400-25 (toutes les parties) prend en charge l'extensibilité, la connectivité et l'interopérabilité.

L'IEC 61400-25 (toutes les parties) sert de base à la simplification de la mise en œuvre des rôles que les éoliennes et les systèmes SCADA doivent jouer. La partie cruciale des informations des centrales éoliennes, les méthodes d'échange d'information et les piles de communication sont normalisées. Elles constituent une base à laquelle il est facile de se référer pour la rédaction des spécifications et des contrats relatifs aux marchés publics.

L'IEC 61400-25 est organisée en plusieurs parties.

- L'IEC 61400-25-1 a une portée introductive, comporte des exigences cruciales et un guide de modélisation.
- L'IEC 61400-25-2 et l'IEC 61400-25-6 contiennent la description du modèle d'information, une vue uniforme, orientée composant, des données relatives aux centrales éoliennes, y compris les extensions pour la surveillance de l'état.
- L'IEC 61400-25-3 décrit les modèles d'échange d'information. Elle reflète la fonctionnalité du serveur.
- L'IEC 61400-25-4 présente cinq options de mapping du modèle d'information et du modèle d'échange d'information à un profil de communication normalisé. Le choix s'effectue en fonction de l'application et de la fonctionnalité et des performances nécessaires.
- L'IEC 61400-25-5 décrit les cas d'essai pour les essais de conformité des mises en œuvre.

NOTE Les performances liées à la mise en œuvre de l'IEC 61400-25 (toutes les parties) sont spécifiques à l'application. L'IEC 61400-25 (toutes les parties) ne garantit pas un certain niveau de performances. Ce type de garantie ne fait pas partie du domaine d'application de l'IEC 61400-25 (toutes les parties). Toutefois, il n'y a pas de limitation sous-jacente à la technologie de communication qui interdirait des applications à haut débit (réponses de l'ordre de la milliseconde).

SYSTÈMES DE GÉNÉRATION D'ÉNERGIE ÉOLIENNE –

Partie 25-1: Communications pour la surveillance et la commande des centrales éoliennes – Description globale des principes et des modèles

1 Domaine d'application

L'IEC 61400-25 (toutes les parties) concerne essentiellement les communications entre les composants des centrales éoliennes, tels que les éoliennes, et des acteurs, tels que les systèmes SCADA. La communication interne entre les composants des centrales éoliennes ne relève pas du domaine d'application de l'IEC 61400-25 (toutes les parties).

L'IEC 61400-25 (toutes les parties) est conçue pour un environnement de communication fondé sur un modèle client-serveur. Trois domaines sont définis, qui sont modélisés séparément pour assurer l'extensibilité des systèmes mis en œuvre:

1) les modèles d'information des centrales éoliennes,
2) le modèle d'échange d'information, et
3) le mapping des deux modèles précédents à un profil de communication normalisé.

Le modèle d'information de centrale éolienne et le modèle d'échange d'information, considérés ensemble, constituent une interface entre le client et le serveur. Dans cette combinaison, le modèle d'information de centrale éolienne sert de cadre pour interpréter les données accessibles de la centrale éolienne. Le modèle d'information de centrale éolienne est utilisé par le serveur pour fournir au client une vue uniforme, orientée composant, des données de la centrale éolienne. Le modèle d'échange d'information reflète toutes les fonctions actives du serveur. L'IEC 61400-25 (toutes les parties) permet de connecter entre eux une combinaison hétérogène de clients et de serveurs issus de différents constructeurs et fournisseurs.

Comme représenté à la Figure 1, l'IEC 61400-25 (toutes les parties) définit un serveur ayant les aspects suivants:

– les informations fournies par un composant de centrale éolienne, par exemple, «vitesse du rotor de l'éolienne» ou «production électrique totale durant un certain laps de temps», sont modélisées et rendues accessibles. Les informations modélisées dans l'IEC 61400-25 (toutes les parties) sont définies dans l'IEC 61400-25-2 et l'IEC 61400-25-6,
– les services pour échanger les valeurs des informations modélisées, définies dans l'IEC 61400-25-3,
– le mapping à un profil de communication, fournissant une pile de protocoles pour transporter les valeurs échangées provenant des informations modélisées (IEC 61400-25-4).

L'IEC 61400-25 (toutes les parties) se contente de définir comment modéliser les informations, l'échange d'information et le mapping à des protocoles de communication spécifiques. L'IEC 61400-25 (toutes les parties) s'abstient de définir comment et où mettre en œuvre l'interface de communication, l'interface de programmation d'application et les recommandations de mise en œuvre. Toutefois, l'objectif de l'IEC 61400-25 (toutes les parties) est de permettre l'accès aux informations associées à un composant individuel de la centrale éolienne (tel qu'une éolienne) par le biais d'un dispositif logique approprié.

La présente partie de l'IEC 61400-25 fournit une description globale des principes et des modèles utilisés dans l'IEC 61400-25 (toutes les parties).

NOTE L'IEC 61400-25 (toutes les parties) concerne essentiellement les informations communes et non spécifiques au fournisseur. Les éléments d'informations qui tendent à varier considérablement en fonction des mises en œuvre spécifiques au fournisseur peuvent, par exemple, être spécifiés dans des accords bilatéraux, par des groupes d'utilisateurs ou dans les amendements de l'IEC 61400-25 (toutes les parties).

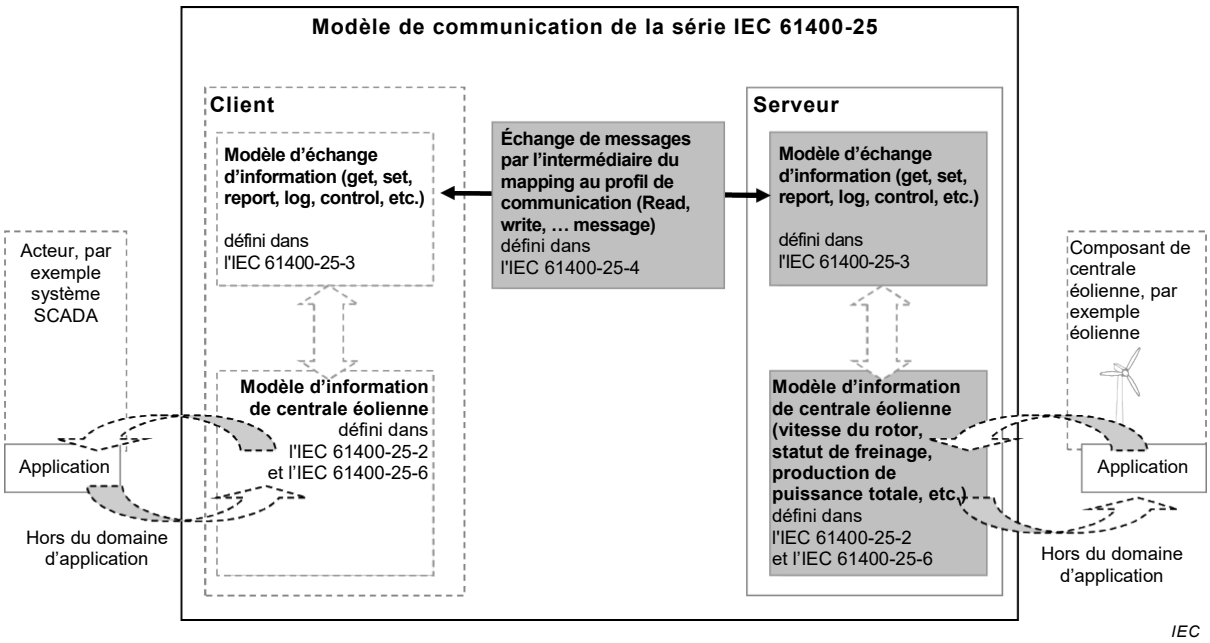


Figure 1 – Modèle conceptuel de communication de la série IEC 61400-25

2 Références normatives

Les documents suivants cités dans le texte constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 61400-25 (toutes les parties), *Éoliennes – Partie 25: Communications pour la surveillance et la commande des centrales éoliennes*

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

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

IEC 61400-25-4, *Systèmes de génération d'énergie éolienne – Partie 25-4: Communications pour la surveillance et la commande des centrales éoliennes – Mapping pour les profils de communication*

IEC 61400-25-6, *Wind energy generation systems – Part 25-6: Communications for monitoring and control of wind power plants – Logical node classes and data classes for condition monitoring* (disponible en anglais seulement)

IEC 61850-7-1:2011, *Réseaux et systèmes de communication pour l'automatisation des systèmes électriques – Partie 7-1: Structure de communication de base – Principes et modèles*

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)* (disponible en anglais seulement)