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Komunikacijska omrežja in sistemi za avtomatizacijo uporabe električne energije - 7-410. del: Hidroelektrarne - Komunikacije za nadzorovanje in krmiljenje (IEC 61850-7-410:2012)

Communication networks and systems for power utility automation - Part 7-410: Hydroelectric power plants - Communication for monitoring and control

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Kommunikationsnetze und -systeme für die Automatisierung in der elektrischen Energieversorgung - Teil 7-410: Wasserkraftwerke - Kommunikation für Überwachung, Regelung und Steuerung

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Réseaux et systèmes de communication pour l'automatisation des systèmes électriques - Partie 7-410: Centrales hydroélectriques - Communication pour contrôle et commande

Ta slovenski standard je istoveten z: EN 61850-7-410:2013**ICS:**

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29.240.30	Krmilna oprema za elektroenergetske sisteme	Control equipment for electric power systems
33.200	Daljinsko krmiljenje, daljinske meritve (telemetrija)	Telecontrol. Telemetry

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English version

**Communication networks and systems for power utility automation -
Part 7-410: Basic communication structure -
Hydroelectric power plants -
Communication for monitoring and control
(IEC 61850-7-410:2012)**

Réseaux et systèmes de communication
pour l'automatisation
des systèmes électriques -
Partie 7-410: Structure
de communication de base -
Centrales hydroélectriques -
Communication pour le contrôle-
commande
(CEI 61850-7-410:2012)

Kommunikationsnetze und -systeme für
die Automatisierung in der elektrischen
Energieversorgung -
Teil 7-410: Wasserkraftwerke -
Kommunikation für Überwachung,
Regelung und Steuerung
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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 57/1274/FDIS, future edition 2 of IEC 61850-7-410, prepared by IEC TC 57 "Power systems management and associated information exchange" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61850-7-410:2013.

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) 2013-09-04
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2015-12-04

This document supersedes EN 61850-7-410:2007.

EN 61850-7-410:2013 includes the following significant technical changes with respect to EN 61850-7-410:2007:

- a) The logical nodes in EN 61850-7-410:2007 that were not specific to hydropower plants have been transferred to EN 61850-7-4:2010 and have been removed from this edition of EN 61850-7-410.
- b) The definitions of logical nodes in this edition of EN 61850-7-410 have been updated using the format introduced in EN 61850-7-4:2010.
- c) Most of the modelling examples and background information that was included in EN 61850-7-410:2007 has been transferred to IEC/TR 61850-7-510.
- d) However, this edition of EN 61850-7-410 includes additional general-purpose logical nodes that were not included in EN 61850-7-4:2010, but are required in order to represent the complete control and monitoring system of a hydropower plant.

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 61850-7-410:2012 was approved by CENELEC as a European Standard without any modification.

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

IEC 61362	NOTE	Harmonized as EN 61362.
IEC 61850-10	NOTE	Harmonized as EN 61850-10.
IEC 61970-301	NOTE	Harmonized as EN 61970-301.
IEC 62270	NOTE	Harmonized as EN 62270.

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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC/TS 61850-2	-	Communication networks and systems in substations - Part 2: Glossary	-	-
IEC 61850-7-1	-	Communication networks and systems for power utility automation - Part 7-1: Basic communication structure - Principles and models	EN 61850-7-1	-
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

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IEC 61850-7-410

Edition 2.0 2012-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Communication networks and systems for power utility automation –
Part 7-410: Basic communication structure – Hydroelectric power plants –
Communication for monitoring and control**

**Réseaux et systèmes de communication pour l'automatisation des systèmes
électriques –
Partie 7-410: Structure de communication de base – Centrales
hydroélectriques – Communication pour le contrôle-commande**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**COMMUNICATION NETWORKS AND SYSTEMS
FOR POWER UTILITY AUTOMATION –**
**Part 7-410: Basic communication structure –
Hydroelectric power plants –
Communication for monitoring and control**

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.
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- 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 61850-7-410 has been prepared by technical committee 57: Power systems management and associated information exchange.

This second edition cancels and replaces the first edition published in 2007, and constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition:

- a) The logical nodes in IEC 61850-7-410:2007 that were not specific to hydropower plants have been transferred to IEC 61850-7-4:2010 and have been removed from this edition of IEC 61850-7-410.
- b) The definitions of logical nodes in this edition of IEC 61850-7-410 have been updated using the format introduced in IEC 61850-7-4:2010.
- c) Most of the modelling examples and background information that was included in IEC 61850-7-410:2007 has been transferred to IEC/TR 61850-7-510.

- d) However, this edition of IEC 61850-7-410 includes additional general-purpose logical nodes that were not included in IEC 61850-7-4:2010, but are required in order to represent the complete control and monitoring system of a hydropower plant.

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

FDIS	Report on voting
57/1274/FDIS	57/1289/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.

A list of all the parts in the IEC 61850 series, published under the general title *Communication networks and systems for power utility automation* 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 web site 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.

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COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

Part 7-410: Basic communication structure – Hydroelectric power plants – Communication for monitoring and control

1 Scope

This part of IEC 61850 specifies the additional common data classes, logical nodes and data objects required for the use of IEC 61850 in a hydropower plant.

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/TS 61850-2, *Communication networks and systems in substations – Part 2: Glossary*

IEC 61850-7-1, *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 for substations and feeder equipment – 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*

3 Terms and definitions

For the purpose of this document, the terms and definitions given in IEC 61850-2 apply.

4 Abbreviated terms

The terms listed in Table 1 are used to build concatenated Data Object Names in this document. IEC 61850-7-410 inherits all the abbreviated terms described in Clause 4 of IEC 61850-7-4:2010.

NOTE Data Object Names in the logical nodes representing PSS filter functions follow names in IEEE 421.5 as closely as possible. These names are not included in Table 1.

Table 1 – Abbreviated terms

Term	Description	Term	Description
Act	Action, activity, active, activate ^a	Lkg	Leakage
Atr	Actuator	Lub	Lubrication
BG	Before Gain	Man	Manual (- operation selected)
Brg	Bearing	Mnt	Maintenance
Brk	Brake	Ndl	Needle (used in Pelton turbines)
Bt	Heartbeat	Nhd	Net head
BtB	Back-to-Back	Nrm	Normal
Cam	Cam, e.g. rotating non-circular disk	Nxt	Next
Cap	Capacity, capability ^a	Off	Device disengaged (= off)
Cbr	Calibration	On	Device applied (= on)
Cff	coefficient	Operate	Operate order to any device
Cm	Centimetres	Opn	Open, opened, opening ^a
Cmpl	Completed, completion, complete	Pe	Electric power
Cnd	Condenser, synchronous compensator	Pmp	Pump
CrI	Correlation	Polytr	Polytropic
Crp	Creeping, slow movement	Prec	Precondition, initial status
Cwb	Crowbar	Prt	Priority
De	Remove	Psk	Penstock
Deg	Degrees, for angle indication in °	Pss	PSS, power system stabiliser function
Dfl	Deflector (used in Pelton turbines)	Qu	Queue
Dia	Diaphragm	Rb	Runner blade
Dith	Dither	Reg	Regulation
Dn	Down, below, downstream, lowest	Req	Requested
Drtb	Draft tube	Rng	Range
Droop	Droop	Rpt	Repeat, repetition
Dtc	Detection	Rtg	Rating, rated
Dvc	Device	Rwy	Runaway, e.g. in runaway speed
Dw	Delta Omega	Saf	Safety
Ena	Enable, allow operation ^a	Sft	Soft (as in soft start)
Fa	"Fire all" sequence (to thyristors)	Shft	Shaft
Fbc	Field breaker configuration	Sld	Solidity
Fir	Fire	SM	Servo, servo-motor
Flm	Flame	SNL	Speed-no-load, connected but not generating
Flsh	Flashing (e.g. field flashing)	Spir	Spiral
Flt	Fault	Srv	Service
Flw	Flow, flowing	Stl	Still, not moving
Fst	Fast	Stnd	Stand, standing
Gdv	Guide vane	Syn	Synchronous, synchronism
Grd	Gradient	Twt	Tailwater, water level at outlet
Gte	Gate, dam gate	Tp	Test Point
Hd	Head	Trb	Turbine
Hwt	Headwater, water level at intake	Trg	Trigger
Hys	Hysteresis	Unt	Unit, production unit
I	Intermediate	Up	Up, above, upstream, upper
J	Joint	Vsi	Voltage stabilizer input
Lft	Lifting, lift	Vst	Voltage stabilizer terminal (output)
Lo	Low, lower (position) ^a		
Lkd	Locked		

^a Extended description of IEC 61850-7-4

5 Logical node classes

5.1 Logical node groups

Logical nodes are grouped together with nodes of similar or related functions having the same first letter. Table 2 shows presently assigned letters, letters marked "reserved" may be used in future extensions to the standard series. Names of logical nodes shall start with the letter of

the group to which the LN belongs. E.g. most of the logical nodes, defined in this document, are specific for hydropower use and thus have names that start with the letter H.

Table 2 – List of logical node groups

A	Automatic control functions
B	Reserved
C	Control functions
D	Functions specific to distributed energy resources (DER)
E	Reserved
F	Logical nodes representing functional blocks
G	Generic references
H	Functions specific to hydropower plants
I	Interface and archiving functions
J	Reserved
K	Kinetic energy, mechanical devices and equipment
L	Physical devices and common logical nodes
M	Metering and measurement
N	Reserved
O	Reserved
P	Electrical protections
Q	Power quality
R	Protection related functions
S	Supervision and monitoring
T	Sensors and transmitters (including instrument transformers)
U	Reserved
V	Reserved
W	Functions specific to wind power plants
X	Switchgear
Y	Power transformers
Z	Power system equipment

5.2 Interpretation of logical node tables

The interpretation of the headings for the logical node tables is presented in Table 3.