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**Komunikacijska omrežja in sistemi za avtomatizacijo porabe električne energije - 8  
-1. del: Preslikava posebne komunikacijske storitve (SCSM) - Preslikave v MMS  
(ISO 9506-1 in ISO 9506-2) in v ISO/IEC 8802-3 - Dopolnilo A1**

Communication networks and systems for power utility automation - Part 8-1: Specific communication service mapping (SCSM) - Mappings to MMS (ISO 9506-1 and ISO 9506-2) and to ISO/IEC 8802-3

Kommunikationsnetze und -systeme für die Automatisierung der elektrischen Energieversorgung - Teil 8-1: Spezifische Abbildung von Kommunikationsdiensten (SCSM) - Abbildungen auf MMS (nach ISO 9506-1 und ISO 9506-2) und ISO/IEC 8802-3

Réseaux et systèmes de communication pour l'automatisation des systèmes électriques - Partie 8-1: Mise en correspondance des services de communication spécifiques (SCSM) - Mises en correspondance pour MMS (ISO 9506-1 et ISO 9506-2) et pour l'ISO/CEI 8802-3

**Ta slovenski standard je istoveten z: EN 61850-8-1:2011/A1:2020**

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**ICS:**

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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EUROPEAN STANDARD

EN 61850-8-1:2011/A1

NORME EUROPÉENNE

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English Version

Communication networks and systems for power utility  
automation - Part 8-1: Specific communication service mapping  
(SCSM) - Mappings to MMS (ISO 9506-1 and ISO 9506-2) and  
to ISO/IEC 8802-3  
(IEC 61850-8-1:2011/A1:2020)

Réseaux et systèmes de communication pour  
l'automatisation des systèmes électriques - Partie 8-1: Mise  
en correspondance des services de communication  
spécifiques (SCSM) - Mise en correspondance pour MMS  
(ISO 9506-1 et ISO 9506-2) et pour l'ISO/IEC 8802-3  
(IEC 61850-8-1:2011/A1:2020)

Kommunikationsnetze und -systeme für die  
Automatisierung der elektrischen Energieversorgung - Teil  
8-1: Spezifische Abbildung von Kommunikationsdiensten  
(SCSM) - Abbildungen auf MMS (nach ISO 9506-1 und ISO  
9506-2) und ISO/IEC 8802-3  
(IEC 61850-8-1:2011/A1:2020)

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This amendment A1 modifies the European Standard EN 61850-8-1:2011; it was approved by CENELEC on 2020-03-27. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

**EN 61850-8-1:2011/A1:2020 (E)****European foreword**

The text of document 57/2150/FDIS, future IEC 61850-8-1/A1, 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 61850-8-1:2011/A1:2020.

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) 2020-12-27
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2023-03-27

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SIST EN 61850-8-1:2011/A1:2020

The text of the International Standard IEC 61850-8-1:2011/A1:2020 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 62351-4:2018      NOTE      Harmonized as EN IEC 62351-4:2018 (not modified)

## Annex ZA (normative)

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

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.

NOTE 1 Where 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).

Delete the following references:

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60874-10-1	1997	Connectors for optical fibres and cables - Part 10-1: Detail specification for fibre optic connector type BFOC/2,5 terminated to multimode fibre type A1	-	-
IEC 60874-10-2	1997	Connectors for optical fibres and cables - Part 10-2: Detail specification for fibre optic connector type BFOC/2,5 terminated to single-mode fibre type B1	-	-
IEC 60874-10-3	1997	Connectors for optical fibres and cables - Part 10-3: Detail specification for fibre optic adaptor type BFOC/2,5 for single and multimode fibre	-	-
IEC 61850-9-1	2003	Communication networks and systems in substations - Part 9-1: Specific Communication Service Mapping (SCSM) - Sampled values over serial unidirectional multidrop point to point link	-	-
ISO/IEC 8602	1995	Information technology - Protocol for providing the OSI connectionless-mode transport service	-	-
ISO/IEC 8649	1996	Information technology - Open Systems Interconnection - Service definition for the association control service element	-	-
ISO/IEC 8650-1	1996	Information technology - Open Systems Interconnection - Connection-oriented protocol for the association control service element: Protocol specification	-	-

**EN 61850-8-1:2011/A1:2020 (E)**

ISO/IEC 8877	1992	Information technology; telecommunications and information exchange between systems; interface connector and contact assignments for ISDN basic access interface located at reference points S and T	-	-
ISO/IEC ISP 10608-1	1992	Information technology - International Standardized Profile TAnnnn - Connection-mode Transport Service over Connectionless-mode Network Service - Part 1: General overview and subnetwork-independent requirements	-	-
ISO/IEC ISP 10608-2	1992	Information technology - International Standardized Profile TAnnnn - Connection-mode Transport Service over Connectionless-mode Network Service - Part 2: TA51 profile including subnetwork-dependent requirements for CSMA/CD Local Area Networks (LANs)	-	-
RFC 4330	-	Simple Network Time Protocol (SNTP) Version 4 for IPv4, IPv6 and OSI	-	-

Replace the following existing references with the following new references:

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61850-6	-	Communication networks and systems for power utility automation - Part 6: Configuration description language for communication in electrical substations related to IEDs	EN 61850-6	-
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 communication structure - Abstract communication service interface (ACSI)	EN 61850-7-2	2010
+A1	2019		+A1	2020
IEC 61850-7-3	-	Communication networks and systems for power utility automation - Part 7-3: Basic communication structure - Common data classes	EN 61850-7-3	-
IEC 61850-7-4	-	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	-

IEC 61850-9-2	-	Communication networks and systems for power utility automation - Part 9-2: Specific communication service mapping (SCSM) - Sampled values over ISO/IEC 8802-3	EN 61850-9-2	-
IEC 62351-6	2019 <sup>1</sup>	Power systems management and associated information exchange - Data and communications security - Part 6: Security for IEC 61850	EN IEC 62351-6	- <sup>2</sup>
IEC 62439-3	2016	Industrial communication networks - High availability automation networks - Part 3: Parallel Redundancy Protocol (PRP) and High-availability Seamless Redundancy (HSR)	EN IEC 62439-3	2018
ISO/IEC/IEEE 8802-3	2014	Standard for Ethernet	-	-
ISO/IEC 8824-1	2015	Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation	-	-
ISO/IEC 8825-1	2015	Information technology - ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)	-	-
ISO/IEC ISP 11188-1	1995	Information technology - International Standardized Profile - Common upper layer requirements - Part 1: Basic connection-oriented requirements	-	-
ISO/IEC ISP 11188-3	1996	Information technology - International Standardized Profile - Common upper layer requirements - Part 3: Minimal OSI upper layer facilities	-	-
IEEE C37.111	1999	IEEE Standard for Common Format for Transient Data Exchange (COMTRADE) for Power Systems	-	-

Add the following references:

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC/IEEE 61850-9-3	-	Communication networks and systems for power utility automation - Part 9-3: Precision time protocol profile for power utility automation	-	-

<sup>1</sup> To be published. Stage at the time of publication: IEC/PRVC 62351-6:2020.

<sup>2</sup> To be published. Stage at the time of publication: prEN IEC 62351-6:2018.

**EN 61850-8-1:2011/A1:2020 (E)**

IEC/TR 61850-90-4	-	Communication networks and systems for power utility automation - Part 90-4: Network engineering guidelines	-	-
IEC 62351-9	-	Power systems management and associated information exchange - Data and communications security - Part 9: Cyber security key management for power system equipment	EN 62351-9	-
IEC/TR 62357-200	2015-08	Power systems management and associated information exchange - Part 200: Guidelines for migration from Internet Protocol version 4 (IPv4) to Internet Protocol version 6 (IPv6)	-	-
IEC 60255-24 / IEEE Std C37.111	2013	Measuring relays and protection equipment - Part 24: Common format for transient data exchange (COMTRADE) for power systems	-	-
ITU-T X.217	1996	Information technology - Open Systems Interconnection - Service definition for the Associated Control Service Element	-	-
ITU-T X.227	1996	Information technology - Open Systems Interconnection - Connection-oriented protocol for the Association Control Service Element. Protocol specification	-	-
ISO 4217	2015	Codes for the representation of currencies	-	-
RFC 919	-	Broadcasting Internet Datagrams	-	-
RFC 1035	-	Domain Names - Implementation and specification	-	-
RFC 1240	-	OSI Connectionless Transport Services on top of UDP Version:1	-	-
RFC 2460	-	Internet Protocol, Version 6 (IPv6) Specification	-	-
RFC 2474	-	Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers	-	-
RFC 2991	-	Multipath Issues in Unicast and Multicast Next-Hop Selection	-	-
RFC 3168	-	The Addition of Explicit Congestion Notification (ECN) to IP	-	-
RFC 3246	-	An Expedited Forwarding PHB (Per-Hop Behavior)	-	-
RFC 3629	-	UTF-8, a transformation format of ISO 1646	-	-
RFC 4291	-	IP Version 6 Addressing Architecture	-	-
RFC 4604	-	Internet Group Management Protocol, Version 3 (IGMPv3)	-	-



RFC 5771	-	IANA Guidelines for IPv4 Multicast Address Assignments	-	-
RFC 5905	-	Network Time Protocol Version 4: Protocol and Algorithms Specification	-	-
RFC 6864	-	Updated Specification of the IPv4 ID Field	-	-

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IEC 61850-8-1

Edition 2.0 2020-02

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



AMENDMENT 1  
AMENDEMENT 1

**Communication networks and systems for power utility automation –  
Part 8-1: Specific communication service mapping (SCSM) – Mappings to MMS  
(ISO 9506-1 and ISO 9506-2) and to ISO/IEC 8802-3**

**Réseaux et systèmes de communication pour l'automatisation des systèmes  
électriques –  
Partie 8-1: Mise en correspondance des services de communication spécifiques  
(SCSM) – Mises en correspondance pour MMS (ISO 9506-1 et ISO 9506-2) et  
pour l'ISO/IEC 8802-3**

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## FOREWORD

This amendment has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

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

- the update of the normative references
- the extension of the transport layer with ipV6
- the extension of the time synchronization A-Profile with 1588 profiled with IEC/IEEE 61850-9-3
- the extension of GOOSE and SMV A and T-Profiles to support the routable GOOSE and SMV introduced by IEC TR 61850-90-5
- the optional support of the new COMTRADE file format
- the removal of OSI-T profile support for client / server communication
- the update of the reference for PRP / HSR causes reference to PRP1 to be change to PRP
- the deprecation of the unicast sample value model
- the deprecation of the GSSE model
- the annex regarding compatibility of different revision of the standard
- provision of clarifications and corrections to the second edition of IEC 61850-8-1, based on the technical issues (tissues) 753, 770, 784, 817, 821, 827, 834, 851, 854, 935, 942, 951, 1036, 1040, 1041, 1042, 1043, 1047, 1058, 1063, 1064, 1068, 1135, 1155, 1164, 1171, 1174, 1178, 1181, 1192, 1274, 1285, 1287, 1289, 1290, 1299, 1300, 1309, 1324, 1336, 1345, 1361, 1369, 1376, 1422, 1440, 1441, 1442, 1443, 1453, 1454, 1462, 1495, 1499, 1500, 1612, 1626, 1629, 1645, 1658.

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

FDIS	Report on voting
57/2150/FDIS	57/2168/RVD

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

A list of all the parts in the IEC 61850 series, under the general title *Communication networks and systems for power utility automation*, can be found on the IEC website.

Contrary to usual IEC practice, for ease of use in this case, all tables and figures (including those which have been added since Edition 2) have been numbered consecutively in the amendment and the consolidated version.

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This publication contains attached.nsd files which compose the Code Component of this part. These files are intended to be used as a complement and do not form an integral part of this standard.

The committee has decided that the contents of this amendment and the base 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.

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## INTRODUCTION

This part of IEC 61850 is part of a set of specifications which details layered utility communication architecture.

This part of IEC 61850 is intended to provide inter-device operation of a variety of devices to achieve interoperability providing detailed information on how to create and exchange concrete communication messages that implement abstract services and models specified in IEC 61850-7-4, IEC 61850-7-3, and IEC 61850-7-2.

The mapping allows for data exchange over ISO/IEC 8802-3 Local Area Networks between all kinds of utility devices. Some of the protocol stacks used within this document are routable. Therefore, the actual communications path may not be restricted to the LAN. Data exchange consists of real-time monitoring and control data, including measured values, to name just a few.

NOTE This part of IEC 61850 does not provide tutorial material. It is recommended that IEC 61850-5 and IEC 61850-7-1 be read in conjunction with IEC 61850-7-2.

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New tables have been introduced in the consolidated edition (2.1) of this document. The following cross reference table delivers the correspondancy.

IEC 61850-8-1:2011	IEC 61850-8-1:2011+AMD1:2019	Table Name
Table 1	Table 1	MMS objects and services in use within this SCSM
Table 2	Table 2	Services requiring client/server Communication Profile
Table 3	Table 3	Service and protocols for client/server communication A-Profile
Table 4	Table 4	Service and protocols for client/server TCP/IP T-Profile
Table 5	<i>deprecated communication profile</i>	Service and protocols for client/server OSI T-Profile
Table 6	Table 5	Services requiring GSE Management and GOOSE communication profile
Table 7	Table 6	Service and protocols for GSE Management and GOOSE communication A-Profile
	Table 7	RFC 1240 A-Profile Options
Table 8	Table 8	GOOSE/GSE T-Profile
	Table 9	UDP Field Implementation Requirements
Table 9	Table 10	Time sync A-Profile
Table 10	Table 11	Time sync T-Profile
	Table 12	Services requiring sampled value Management and sampled value communication profile
	Table 13	Service and protocols for Sampled value Management and Multicast sampled value communication A-Profile
	Table 14	MSV T-Profile
Table 11	Table 15	Mapping of ACSI BasicTypes
Table 12	Table 16	PhyComAddr structure for Layer 2 communication
Table 13	Table 17	Associate ACSI service error mappings
Table 14	Table 18	Release service error mappings
Table 15	Table 19	GetNameList conflicting IEC 61850 objectClass and objectScope
Table 16	Table 20	GetNameList service error mappings
Table 17	Table 21	Read of NamedVariableList object error mappings
Table 18	Table 22	Write of NamedVariableList object error mappings
Table 19	Table 23	DefineNamedVariableList service error mappings
Table 20	Table 24	GetNamedVariableListAttributes service error mappings
Table 21	Table 25	DeleteNamedVariableList service error mappings
Table 22	Table 26	Read service error mappings
Table 23	Table 27	Write service error mappings
Table 24	Table 28	GetVariableAccessAttributes service error mappings
Table 25	Table 29	ServiceError mappings for Log services
Table 26	Table 30	FileDirectory service error mappings
Table 27	Table 31	Mappings of ACSI ServiceError to ObtainFile ServiceError
Table 28	Table 32	Mappings of ACSI ServiceError to FileOpen ServiceError
Table 29	Table 33	Mappings of ACSI ServiceError to FileRead ServiceError
Table 30	Table 34	Mappings of ACSI ServiceError to FileClose ServiceError
Table 31	Table 35	Mappings of ACSI ServiceError to FileDelete ServiceError
Table 32	Table 36	Encoding of IEC 61850-7-2 TimeQuality
	Table 37	Encoding of the TriggerConditions