



BSI Standards Publication

Communication networks and systems for power utility automation

Part 9-2: Specific communication service mapping
(SCSM) — Sampled values over ISO/IEC 8802-3

National foreword

This British Standard is the UK implementation of EN 61850-9-2:2011+A1:2020. It is identical to IEC 61850-9-2:2011 incorporating amendment 1:2020. It supersedes BS EN 61850-9-2:2011, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment 1 is indicated by **A1** **A1**.

The UK participation in its preparation was entrusted to Technical Committee PEL/57, Power systems management and associated information exchange.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Amendments/corrigenda issued since publication

Date	Text affected
30 April 2020	Implementation of IEC amendment 1:2020 with CENELEC endorsement A1:2020

English Version

Communication networks and systems for power utility
automation - Part 9-2: Specific communication service mapping
(SCSM) - Sampled values over ISO/IEC 8802-3
(IEC 61850-9-2:2011)

Réseaux et systèmes de communication pour
l'automatisation des systèmes électriques - Partie 9-2: Mise
en correspondance des services de communication
spécifiques (SCSM) - Valeurs échantillonnées sur ISO/IEC
8802-3
(IEC 61850-9-2:2011)

Kommunikationsnetze und -systeme für die
Automatisierung in der elektrischen Energieversorgung -
Teil 9-2: Spezifische Abbildung von
Kommunikationsdiensten (SCSM) - Abgetastete Werte über
ISO/IEC 8802-3
(IEC 61850-9-2:2011)

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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

European foreword

The text of document 57/1133/FDIS, future edition 2 of IEC 61850-9-2, 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 61850-9-2:2011.

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) 2012-07-27
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2014-10-27

This document supersedes EN 61850-9-2:2004.

EN 61850-9-2:2011 includes the following significant technical changes with respect to EN 61850-9-2:2004:

- addition of an optional Link redundancy layer (Tables 3 to 6);
- redefinition of "reserved" fields in link layer (5.3.3.4);
- evolution of USVCB and MSVCB components (Tables 9, 10, 12);
- evolution of encoding for the transmission of the sampled value buffer (Table 14).

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Endorsement notice

The text of the International Standard IEC 61850-9-2:2011 was approved by CENELEC as a European Standard without any modification.

Foreword to amendment A1

The text of document 57/2112/FDIS, future IEC 61850-9-2/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 61850-9-2:2011/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) 2020-12-18
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2023-03-18

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This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

Endorsement notice

The text of the International Standard IEC 61850-9-2:2011/A1:2020 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 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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60874-10-3	-	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 61588	2009	Precision clock synchronization protocol for networked measurement and control systems	-	-
IEC/TS 61850-2	-	Communication networks and systems in substations - Part 2: Glossary	-	-
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 61850-7-2	-	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	-
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	-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61850-8-1	-	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	EN 61850-8-1	-
IEC/TR 61850-90-4	-	Communication networks and systems for power utility automation - Part 90-4: Network engineering guidelines	-	-
IEC/TS 62351-6 ¹	-	Power systems management and associated information exchange - Data and communications security - Part 6: Security for IEC 61850	-	-
IEC 62439-3	2016	Industrial communication networks - High availability automation networks - Part 3: Parallel Redundancy Protocol (PRP) and High-availability Seamless Redundancy (HSR)	-	-
IEC/IEEE 61850-9-3	-	Communication networks and systems for power utility automation - Part 9-3: Precision time protocol profile for power utility automation	-	-
ISO/IEC 8326	1996	Information technology - Open systems Interconnection - Session service definition	-	-
ISO/IEC 8327-1	1996	Information technology - Open Systems Interconnection - Connection-oriented Session protocol: Protocol specification	-	-
ISO/IEC 8649	1996	Information technology - Open systems interconnection - Service definition for the Association Control Service Element (ACSE)	-	-
ISO/IEC 8650-1	1996	Information technology - Open systems interconnection - Connection-oriented protocol for the association control service element: Protocol specification	-	-
ISO/IEC 8802-3	2000	Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications	-	-
ISO/IEC 8822	1994	Information technology - Open Systems Interconnection - Presentation service definition	-	-
ISO/IEC 8823-1	1994	Information technology - Open Systems Interconnection - Connection-oriented presentation protocol: Protocol specification	-	-
ISO/IEC 8824-1	2008	Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation	-	-
ISO/IEC 8825-1	-	Information technology - ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)	-	-

¹⁾ 1 Under preparation. Stage at the time of publication: IEC TS/PRVC 62351-6:2020.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO 4217	2015	Codes for the representation of currencies	-	-
ISO 9506-1	2003	Industrial automation systems - Manufacturing - Message Specification - Part 1: Service definition	-	-
ISO 9506-2	2003	Industrial automation systems - Manufacturing Message Specification - Part 2: Protocol specification	-	-
IEEE 754	1985	Binary Floating-Point Arithmetic (R1990)	-	-
IEEE 802.1Q	1998	IEEE Standard for Local and Metropolitan Area Networks: Virtual Bridged Local Area Networks	-	-
IETF RFC 791	-	Internet Protocol - DARPA Internet Program Protocol Specification	-	-
IETF RFC 792	-	Internet Control Message Protocol	-	-
IETF RFC 793	-	Transmission Control Protocol - DARPA Internet Program Protocol Specification	-	-
IETF RFC 826	-	Ethernet Address Resolution Protocol	-	-
IETF RFC 894	-	Standard for the Transmission of IP Datagrams over Ethernet Networks	-	-
IETF RFC 919	-	Broadcasting Internet Datagrams	-	-
IETF RFC 1006	-	ISO transport services on top of TCP: Version 3	-	-
IETF RFC 1112	-	Host Extensions for IP Multicasting	-	-
RFC 2460	-	Internet Protocol, Version 6 (IPv6) Specification	-	-

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CONTENTS

FOREWORD	4
INTRODUCTION	6
1 Scope	7
2 Normative references	7
3 Terms and definitions	9
4 Abbreviated terms	9
5 Communication stack	10
5.1 Overview of the protocol usage	10
5.2 Client/server services and communication profiles	11
5.3 SV service and communication profile	11
5.3.1 SV mapping overview	11
5.3.2 A-Profile	12
5.3.3 T-Profile	12
5.4 Restrictions	15
6 Mapping of IEC 61850-7-2 and IEC 61850-7-3 data attributes	15
7 Mapping of IEC 61850-7-2 classes and services	15
7.1 Classes of SV data sets	15
7.2 Definition of SV data sets	16
8 Mapping of the model for the transmission of sampled values	16
8.1 Overview	16
8.2 Mapping of the multicast sampled value control block class and services	16
8.2.1 Multicast sampled value control block definition	16
8.2.2 MSV Services	18
8.3 Mapping of the unicast sampled value control block class and services	18
8.4 Mapping of the update of the sampled value buffer	18
8.5 Additional definitions for the transmission of sampled values	19
8.5.1 Application layer functionality	19
8.5.2 Presentation layer functionality	19
8.6 Definitions for basic data types – Presentation layer functionality	21
9 Synchronization	23
10 Conformance	24
10.1 Notation	24
10.2 PICS	24
10.2.1 Profile conformance	24
10.2.2 SV Services	25
11 Substation configuration language (SCL)	25
12 SCSM specific address element definitions	26
Annex A (informative) ISO/IEC/IEEE 8802-3 frame format and ASN.1 basic encoding rules	27
A.1 ISO/IEC/IEEE 8802-3 frame format	27
A.2 ASN.1 basic encoding rules (BER)	30
A.3 Example for an ASN.1 coded APDU frame structure	31
Annex B (informative) Multicast address selection	32

Annex C (normative) Compatibility of the different revisions of this standard.....	33
C.1 General.....	33
C.2 Compatibility rules for IEC 61850-9-2.....	33
C.3 Other modifications to consider for backward / forward compatibility	33
C.3.1 Deferral of Physical Layer specification	33
C.3.2 Adding new optional fields in frame	33
C.3.3 Adding time synchronization specifications	33
C.3.4 Removal of field values.....	33
C.3.5 Changing attribute values	34
Figure 1 – OSI reference model and profiles	11
Figure 2 – Structure of the tag header.....	13
Figure 3 – Reserved 1	15
Figure 4 – Concatenation of several ASDU's into one frame	19
Figure A.1 – ISO/IEC/IEEE 8802-3 frame format – No link redundancy	27
Figure A.2 – ISO/IEC/IEEE 8802-3 frame format – Link redundancy: HSR	28
Figure A.3 – ISO/IEC/IEEE 8802-3 frame format – Link redundancy: PRP	29
Figure A.4 – Basic encoding rules format.....	30
Figure A.5 – Format of the tag octets	30
Figure A.6 – Example for an ASN.1 coded APDU frame structure	31
Table 4 – Service requiring SV communication profile	11
Table 5 – Service and protocols for SV communication A-Profile	12
Table 6 – SV T-Profile	12
Table 7 – Default Virtual LAN IDs and priorities.....	13
Table 8 – Assigned Ethertype values	14
Table 9 – MMS TypeDescription definition for MSVCB MMS structure	16
Table 10 – PhyComAddr structure	18
Table 20 – Mapping of OptFlds within Bitstring	18
Table 11 – Mapping of multicast sampled value services	18
Table 14 – Encoding for the transmission of the sampled value buffer	20
Table 15 – Encoding for the basic data types.....	22
Table 21 – Mapping for IEC 61850-7-2 quality	23
Table 16 – PICS for A-Profile support	25
Table 17 – PICS for T-Profile support	25
Table 18 – SV conformance statement	25
Table 19 – Definitions for SV SCL	26
Table B.1 – Recommended multicast addressing example	32

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

Part 9-2: Specific communication service mapping (SCSM) – Sampled values over ISO/IEC 8802-3

FOREWORD

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International Standard IEC 61850-9-2 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

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

FDIS	Report on voting
57/1133/FDIS	57/1161/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 second edition cancels and replaces the first edition published in 2004 and constitutes a technical revision.

Main changes with respect to the first edition are:

- addition of an optional Link redundancy layer (Tables 3 to 6);
- redefinition of “reserved” fields in link layer (5.3.3.4);
- evolution of USVCB and MSVCB components (Tables 9, 10, 12);
- evolution of encoding for the transmission of the sampled value buffer (Table 14).

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

A list of all parts of the IEC 61850 series, 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.

INTRODUCTION

This part of IEC 61850 defines the SCSM for sampled values over ISO/IEC 8802-3. The intent of this SCSM definition is to include the complete mapping of the sampled value model.

This part of IEC 61850 applies to all electronic sensors related to process measurements of the T logical node group having a digital sampled value output stream such as current and voltage transformers, merging units, or devices acting as T group publishers as well as subscribing intelligent electronic devices, for example protection units, bay controllers and meters.

Process bus communication structures can be arranged in different ways as described in IEC TR 61850-1. In addition to the transmission of sampled value data sets, which are directly connected to ISO/IEC 8802-3, a selection of IEC 61850-8-1 services is necessary to support the access to the SV control block. References to the relevant IEC 61850-8-1 services are provided in this SCSM. For less complex devices (for example merging units), the sampled value control block can be pre-configured, in which case there is no need to implement IEC 61850-8-1 services based on the MMS-Stack.

This document defines the mapping of sampled value class model (IEC 61850-7-2) to ISO/IEC 8802-3. This SCSM, in combination with IEC 61850-7 and IEC 61850-6, allows interoperability between devices from different manufacturers.

This standard does not specify individual implementations or products, nor does it constrain the implementation of entities and interfaces within a computer system. This standard specifies the externally visible functionality of implementations together with conformance requirements for such functionalities.

Reading guide:

- This document is an extended mapping specification of IEC 61850-8-1 to cover sampled value transmission over ISO/IEC 8802-3.
- This document can best be understood if the reader is thoroughly familiar with IEC 61850-7-1, IEC 61850-7-2, IEC 61850-7-3 and IEC 61850-7-4.
- The ACSI services defined in IEC 61850-7-2 are not explained in this part of IEC 61850.