AS IEC 61850.8.1:2025

IEC 61850-8-1:2011+AMD1:2020 CSV

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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



AS IEC 61850.8.1:2025

This Australian Standard® was prepared by EL-050, Power System Control and Communication. It was approved on behalf of Standards Australia's Standards Development and Accreditation Committee on 26 November 2025.

This Standard was published on 19 December 2025.

The following are represented on Committee EL-050:

Australian Energy Market Operator
Australian Industry Group
CIGRE Australia
Clean Energy Council
Energy Networks Australia
Engineers Australia
Victoria University

This Standard was issued for comment as DR AS IEC 61850.8.1:2025

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ISBN: 978 1 76175 549 1

AS IEC 61850.8.1:2025
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First published as AS 61850.8.1—2005.
Revised and redesignated as AS IEC 61850.8.1:2025.

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(ii) The Scope states what the Standard is about, what it covers and what it does not cover.

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(3) A Bibliography lists documents referenced in the Standard but not as part of requirements.

Many Standards include notes. Notes provide recommendations and/or guidance only. They never contain requirements.

Preface

This Standard was prepared by the Standards Australia Committee EL-050, Power System Control and Communication, to supersede AS 61850.8.1:2005, *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.*

The objective of this document is to specify a method of exchanging time-critical and non-time-critical data through local-area networks by mapping ACSI to MMS and ISO/IEC 8802-3 frames., and defines a standardized method of using the ISO 9506 services to implement the exchange of data. For those ACSI services defined in AS IEC 61850.7.2:202X that are not mapped to MMS, this part defines additional protocols. It describes real utility devices with respect to their external visible data and behaviour using an object-oriented approach. The objects are abstract in nature and may be used to a wide variety of applications. The use of this mapping goes far beyond the application in the utility communications. The main changes with respect to the previous edition are listed below:

(a) the support of gigabit Ethernet,

(b) the link layer redundancy,

(c) the extension of the length of the object reference,

(d) the extension of the reason for inclusion type for comprehensive logging,

(e) the mapping of the tracking services,

(f) a second mapping of the object Reference when used in the tracking services, or as linking,

(g) the extension of the Additional Cause enumeration,

(h) the simulation of GOOSE telegram,

(i) the so-called fixed-length encoded GOOSE,

(j) the removal of the SCL Control Block.

This document is identical to, and has been reproduced from, IEC 61850-8-1:2011+AMD1:2020 CSV, *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*.

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FOREWORD

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International Standard IEC 61850-8-1 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

This second edition cancels and replaces the first edition, published in 2004, and constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

– the support of gigabit Ethernet,

– the link layer redundancy,

– the extension of the length of the object reference,

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- the extension of the reason for inclusion type for comprehensive logging,
- the mapping of the tracking services,
- a second mapping of the objectReference when used in the tracking services, or as linking,
- the extension of the AdditionalCause enumeration,
- the simulation of GOOSE telegram,
- the so-called fixed-length encoded GOOSE,
- the removal of the SCL Control Block,
- the mappings of ACSI service error codes and ISO 9506 error codes have changed (see 8.1.3.4). One change that should be noted is the change in usage of object-undefined. The object-undefined code has been replaced by object-non-existent in many responses.

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

FDIS	Report on voting
57/1109/FDIS	57/1127/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, under the general title *Communication networks and systems for power utility automation*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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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INTRODUCTION

This document 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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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

1 Scope

This part of IEC 61850 specifies a method of exchanging time-critical and non-time-critical data through local-area networks by mapping ACSI to MMS and ISO/IEC 8802-3 frames.

MMS services and protocol are specified to operate over full OSI and TCP compliant communications profiles. The use of MMS allows provisions for supporting both centralized and distributed architectures. This standard includes the exchange of real-time data indications, control operations, report notification.

It specifies the mapping of the objects and services of the ACSI (Abstract Communication Service Interface, IEC 61850-7-2) to MMS (Manufacturing Message Specification, ISO 9506) and ISO/IEC 8802-3 frames.

This standard also specifies the mapping of time-critical information exchanges to non-MMS protocol. The protocol semantics are defined in IEC 61850-7-2. It contains the protocol syntax, definition, mapping to ISO/IEC 8802-3 frame formats and any relevant procedures specific to the use of ISO/IEC 8802-3.

This mapping of ACSI to MMS defines how the concepts, objects, and services of the ACSI are to be implemented using MMS concepts, objects, and services. This mapping allows interoperability across functions implemented by different manufacturers.

This part of IEC 61850 defines a standardized method of using the ISO 9506 services to implement the exchange of data. For those ACSI services defined in IEC 61850-7-2 that are not mapped to MMS, this part defines additional protocols. It describes real utility devices with respect to their external visible data and behaviour using an object oriented approach. The objects are abstract in nature and may be used to a wide variety of applications. The use of this mapping goes far beyond the application in the utility communications.

This part of IEC 61850 provides mappings for the services and objects specified within IEC 61850-7-2, IEC 61850-7-3, and IEC 61850-7-4.

2 Normative references

The following referenced documents are indispensable for the application 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 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 connector type BFOC/2,5 for single and multimode fibre*

IEC 61850 (all parts), *Communication networks and systems for power utility automation*

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

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