AS IEC 61850.8.2:2025
IEC 61850-8-2:2018

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Communication networks and systems for power utility automation

Part 8.2: Specific communication service mapping (SCSM) — Mapping to Extensible Messaging Presence Protocol (XMPP)



AS IEC 61850.8.2:2025

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 61850.8.2:2025

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ISBN: 978 1 76175 535 4

AS IEC 61850.8.2:2025
IEC 61850-8-2:2018

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Part 8.2: Specific communication service mapping (SCSM) — Mapping to Extensible Messaging Presence Protocol (XMPP)

First published as AS IEC 61850.8.2:2025.

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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.

The objective of this document is to specify a method of exchanging data through any kinds of network, including public networks. Among the various kinds of services specified in AS IEC 61850.7.2:2025, only the client/server and time synchronization services are considered so far.

NOTE Client/server services of GOOSE and SMV models are mapped as well.

For the client/server services, the principle is to map the objects and services of the ACSI (Abstract Communication Service Interface defined in AS IEC 61850.7.2:2025) to XML messages transported over XMPP. The mapping description includes mainly three aspects:

(a) The usage of the XMPP protocol itself, describing in details which features are really used and how they are used by the mapping.

(b) How to achieve end-to-end secured communications.

(c) The description of the XML payloads corresponding to each ACSI service thanks in particular to the XML Schema and XML message examples.

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FOREWORD

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International Standard IEC 61850-8-2 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
57/2020/FDIS	57/2039/RVD

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

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

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A list of all 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 document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

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INTRODUCTION

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

The usage of the IEC 61850 communication standard is largely spreading over all the domains connected to the smart grid, pushing the usage of technologies adapted to the connection of a very large number of applications and devices across the intra/inter-net. The involved domains use already well established protocols typically for exchanging data with IT level applications like resource planning, asset and maintenance management, etc. Therefore, it becomes imperative to provide an integration strategy that allows the integration of IEC 61850 into these various disparate protocols and information.

In this context, this part of IEC 61850 describes a specific communication service mapping (SCSM) over the Extensible Messaging and Presence Protocol (XMPP), 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.

This mapping is intended to be utilized between all kinds of utility Distributed Energy Resource devices and their related management systems, in particular over public networks.

NOTE This part of IEC 61850 does not provide tutorial material. For this purpose, IEC 61850–5 and IEC 61850-7-1 can be read in conjunction with IEC 61850-7-2.

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Communication networks and systems for power utility automation

Part 8.2: Specific communication service mapping (SCSM) — Mapping to Extensible Messaging Presence Protocol (XMPP)

1 Scope

1.1 General

This part of IEC 61850 specifies a method of exchanging data through any kinds of network, including public networks. Among the various kinds of services specified in IEC 61850-7-2, only the client/server and time synchronization services are considered so far.

NOTE Client/server services of GOOSE and SMV models are mapped as well (see Table 1).

For the client/server services, the principle is to map the objects and services of the ACSI (Abstract Communication Service Interface defined in IEC 61850-7-2) to XML messages transported over XMPP. The mapping description includes mainly three aspects:

- The usage of the XMPP protocol itself, describing in details which features are really used and how they are used by the mapping (see Clause 6).
- How to achieve end-to-end secured communications (see Clause 7).
- The description of the XML payloads corresponding to each ACSI service thanks in particular to the XML Schema and XML message examples (starting at Clause 9).

NOTE 1 This document does not address the detailed usage of the XMPP protocol.

NOTE 2 This document does not address system management services.

NOTE 3 For the information of people familiar with the mapping defined in IEC 61850-8-1, the XML messages defined in the present document are derived from those defined in IEC 61850-8-1 but with an XML encoding instead of a binary one. In this way implementing gateways between IEC 61850-8-1 and IEC 61850-8-2 is very straightforward in both directions. However reading IEC 61850-8-1 is not necessary to understand the present document except when it is used in conjunction with one of the GOOSE mappings described in IEC 61850-8-1.

1.2 Namespace name and version

This new section is mandatory for any IEC 61850 namespace (as defined by IEC 61850-7-1).

The parameters which identify this release of the SCSM_8_2 namespace xmlns="http://www.iec.ch /61850/2018/SCSM_8_2" are:

- Namespace Version: 2018
- Namespace Revision: A
- Namespace Release: 1
- Namespace release date: 2018-12

Edition	Publication date	Webstore	Namespace
Edition 1.0	2018-12	IEC 61850-8-2:2018	IEC 61850-8-2:2018

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1.3 Code Component distribution

The Code Components included in this IEC standard are also available as electronic machine readable file at:

http://www.iec.ch/tc57/supportdocuments/IEC_61850-8-2.2018_ed1.0.XSD.2018A1.full.zip

The Code Component(s) included in this IEC standard are potentially subject to maintenance works and users shall select the latest release in the repository located at: https://www.iec.ch/tc57/supportdocuments.

The latest version/release of the document will be found by selecting the file IEC 61850-8-2.2018_ed1.0.XSD.{VersionStateInfo}.full.zip with the filed VersionStateInfo of the highest value.

In case of any differences between the downloadable code mentioned above and the IEC pdf published content, the downloadable code(s) is(are) the valid one; it may be subject to updates. See history files.

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

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

IEC 61850–5, *Communication networks and systems for power utility automation – Part 5: Communication requirements for functions and device models*

IEC 61850–6, *Communication networks and systems for power utility automation – Part 6: Configuration description language for communication in electrical substations related to IEDs*

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 61850-7-2:2010/AMD1:2018

IEC 61850-7-3, *Communication networks and systems for power utility automation – Part 7-3: Basic communication structure – Common data classes*

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*

IEC 61850-8-1:2011, *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/AMD1:2018

IEC 62351 (all parts), *Power systems management and associated information exchange – Data and communications security*

IEC 62351-4:2018, *Power systems management and associated information exchange – Data and communications security – Part 4: Profiles including MMS and derivatives*[1]

[1] Under preparation. Stage at the time of publication: IEC/DECFDIS 62351-4:2018.

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