IEC TS 62351-100-1

Edition 1.0 2018-11

TECHNICAL SPECIFICATION

colour inside

Power systems management and associated information exchange – Data and communications security –
Part 100-1: Conformance test cases for IEC TS 62351-5 and IEC TS 60870-5-7

IEC TS 62351-100-1:2018-11(en)

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.200

ISBN 978-2-8322-6182-8

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Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 62351-100-1, which is a technical specification, has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
57/1980/DTS	57/2016/RVDTS

Full information on the voting for the approval of this technical specification 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.

A list of all parts in the IEC 62351 series, published under the general title *Power systems management and associated information exchange – Data and communications security*, 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- withdrawn,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.

A bilingual version of this publication may be issued at a later date.

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INTRODUCTION

This technical specification describes test cases for conformance testing of telecontrol equipment or systems using the IEC TS 62351-5 security extension and its application in IEC TS 60870-5-7 for IEC 60870-5-101 and IEC 60870-5-104 communication protocols.

POWER SYSTEMS MANAGEMENT AND ASSOCIATED INFORMATION EXCHANGE – DATA AND COMMUNICATIONS SECURITY –

Part 100-1: Conformance test cases for IEC TS 62351-5 and IEC TS 60870-5-7

1 Scope

This part of IEC 62351, which is a technical specification, describes test cases of data and communication security for telecontrol equipment, substation automation systems (SAS) and telecontrol systems, including front-end functions of SCADA.

The goal of this document is to enable interoperability by providing a standard method of testing protocol implementations to verify that a device fulfils the requirement of the standard. Note that conformity to the standard does not guarantee interoperability between devices using different implementations. It is expected that using this specification during testing will minimize the risk of non-interoperability. A basic condition for this interoperability is a passed conformance test of both devices.

The scope of this document is to specify commonly available procedures and definitions for conformance and/or interoperability testing of IEC TS 62351-5 and IEC TS 60870-5-7. The conformance test cases defined herein are focused to verify the conformant integration of the underlying authentication, as specified in IEC TS 62351-5 and IEC TS 60870-5-7, to protect IEC 60870-5-101 and IEC 6870-5-104-based communications.

This document deals with data and communication security conformance testing; therefore, other requirements, such as safety or EMC, are not covered. These requirements are covered by other standards (if applicable) and the proof of compliance for these topics is done according to these standards.

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.[1]

IEC 60870-5-6:2006, *Telecontrol equipment and systems – Part 5-6: Guidelines for conformance testing for the IEC 60870-5 companion standards*l

IEC TS 60870-5-7:2013, *Telecontrol equipment and systems – Part 5-7: Transmission protocols – Security extensions to IEC 60870-5-101 and IEC 60870-5-104 protocols (applying IEC 62351)*

IEC 60870-5-101:2003, *Telecontrol equipment and systems – Part 5-101: Transmission protocols – Companion standard for basic telecontrol tasks*

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1 The base standard always takes precedence. In case of ambiguity between this document and the base standards (IEC TS 62351-5 and IEC TS 60870-5-7), this part of IEC 62351 needs to be clarified or amended.

When testing, negative behaviour is not described in the base standard. The behaviour described in this document prevails and should be observed. The conformance statement produced after testing indicates any lack of conformance to either the test plan or the base standard.

IEC 60870-5-104:2006, *Telecontrol equipment and systems – Part 5-104: Transmission protocols – Network access for IEC 60870-5-101 using standard transport profiles*

IEC TS 60870-5-601:2015, *Telecontrol equipment and systems – Part 5-601: Transmission protocols – Conformance test cases for the IEC 60870-5-101 companion standard*

IEC TS 60870-5-604:2016, *Telecontrol equipment and systems – Part 5-604: Conformance test cases for the IEC 60870-5-104 companion standard*

IEC TS 62351-2, *Power systems management and associated information exchange – Data and communications security – Part 2: Glossary of terms*

IEC TS 62351-5:2013, *Power systems management and associated information exchange – Data and communications security – Part 5: Security for IEC 60870-5 and derivatives*

IEC 62351-9:2017, *Power systems management and associated information exchange – Data and communications security – Part 9: Cyber security key management for power system equipment*

3 Terms, definitions and abbreviated terms

For the purposes of this document, the terms and definitions given in IEC TS 62351-2 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1 Terms and definitions

3.1.1
Application Service Data Unit
ASDU
application layer message submitted to lower layers for transmission

3.1.2
control direction
direction of transmission from the controlling station to a controlled station

3.1.3
controlled station
station which is monitored, or commanded and monitored by a master (controlling) station

Note 1 to entry: This is commonly called an “outstation” or “slave” or “server” in some specifications.

3.1.4
controlling station
station which performs the telecontrol of outstations (controlled station)

Note 1 to entry: This is commonly called a “master” or “master station” or “client” in some specifications.

3.1.5
interoperability
ability of two or more telecontrol devices from the same vendor, or different vendors, to exchange information and use that information for correct cooperation