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BSI Standards Publication

Telecontrol equipment and systems

Part 5-601: Transmission protocols — Conformance test cases for the IEC 60870-5-101 companion standard

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National foreword

This Published Document is the UK implementation of IEC/TS 60870-5-601:2015. It supersedes DD IEC/TS 60870-5-601:2006 which is withdrawn.

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.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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FOREWORD

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- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- The subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

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

This technical specification is to be used in conjunction with IEC 60870-5-101:2003/AMD1:2015. IEC 60870-5-101:2003/AMD1:2015 resolves ambiguities and inconsistencies discovered by users of the standard and was worked out in parallel with IEC 60870-5-601:2006.

IEC 60870-5-601, which is a technical specification, 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 2006. This edition constitutes a technical revision.

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

a) Resolving ambiguities and inconsistencies between IEC 60870-5-101:2003 and IEC TS 60870-5-601:2006;
b) Enhancements and optimisation of test cases which are needed to prove conformance with IEC 60870-5-101:2003;
c) Additional negative test cases made to avoid circulation of messages not conformant with IEC 60870-5-101:2003.

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

Enquiry draft	Report on voting
57/1528/DTS	57/1590/RVC

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

A list of all parts of the IEC 60870 series, under the general title *Telecontrol equipment and systems*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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

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.

TELECONTROL EQUIPMENT AND SYSTEMS –

Part 5-601: Transmission protocols – Conformance test cases for the IEC 60870-5-101 companion standard

1 Scope

This part of IEC 60870describes test cases for conformance testing of telecontrol equipment, Substation Automation Systems (SAS) and telecontrol systems, including front-end functions of SCADA.

The use of this part of IEC 60870 facilitates interoperability by providing a standard method of testing protocol implementations, but it does not guarantee interoperability of devices. It is expected that using this part of IEC 60870 during testing will minimize the risk of non-interoperability.

The goal of this part of IEC 60870 is to enable unambiguous and standardised evaluation of IEC 60870-5 companion standard protocol implementations. The guidelines and conditions for the testing environment are described in IEC 60870-5-6. The detailed test cases per companion standard, containing among others mandatory and optional mandatory test cases per Basic Application Function, ASDU and transmission procedures, will become available as a technical specification (TS). Other functionality may need additional test cases but this is beyond the scope of this part of IEC 60870. For proper testing, it is recommended to define these additional test cases.

This part of IEC 60870 deals mainly with communication 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 in accordance with these standards.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies[1].

IEC 60870-5-1:1990, *Telecontrol equipment and systems – Part 5: Transmission protocols – Section One: Transmission frame formats*

IEC 60870-5-2:1992, *Telecontrol equipment and systems – Part 5: Transmission protocols – Section 2: Link transmission procedures*

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1 The base standard always takes precedence. In case of ambiguity between this part of IEC 60870 and the base standards (IEC 60870-5-1 to IEC 60870-5-5, IEC 60870-5-101), this part of IEC 60870 needs to be clarified or amended.

When testing negative behaviour is not described in the base standard, the behaviour described in this part of IEC 60870 shall prevail and shall be observed.

The conformance statement produced after testing shall indicate any lack of conformance to either the test plan or the base standard.