

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

**Communication networks and systems for power utility automation –  
Part 3: General requirements**

**Réseaux et systèmes de communication pour l'automatisation  
des systèmes électriques –  
Partie 3: Exigences générales**



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**COMMUNICATION NETWORKS AND  
SYSTEMS FOR POWER UTILITY AUTOMATION –****Part 3: General requirements**

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International Standard IEC 61850-3 has been prepared by IEC technical committee 57: Power systems management and associated information exchange system.

This second edition cancels and replaces the first edition published in 2002. This edition constitutes a technical revision.

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

- a) requirements are in line with those of other equipment used in the same environment (e.g. protection relays);
- b) product safety added based on IEC 60255-27;
- c) EMC requirements completed and in line with IEC 60255 series and IEC 61000-6-5.

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

FDIS	Report on voting
57/1391/FDIS	57/1416/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.

In this standard, the following print types are used:

- compliance statements: in italic type;
- markings: in bold type and caps.

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 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- withdrawn,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.

# COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

## Part 3: General requirements

### 1 Scope

This part of IEC 61850 defines the general requirements, mainly regarding construction, design and environmental conditions for utility communication and automation IEDs and systems in power plant and substation environments. These general requirements are in line with requirements for IEDs used in similar environments, for example measuring relays and protection equipment.

When communication or automation IEDs are an integral part of another device in the power plant or substation, then the environmental requirements for the device itself apply to the communications equipment.

### 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.

IEC 60068-2-1:2007, *Environmental testing – Part 2-1: Tests – Test A: Cold*

IEC 60068-2-2:2007, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

IEC 60068-2-14:2009, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-30:2005, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60068-2-78:2001, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

IEC 60255-21-1, *Electrical relays – Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment – Section 1: Vibration tests (sinusoidal)*

IEC 60255-21-2, *Electrical relays – Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment – Section 2: Shock and bump tests*

IEC 60255-21-3, *Electrical relays – Part 21: Vibration, shock, bump and seismic tests on measuring relays and protection equipment – Section 3: Seismic tests*

IEC 60255-27:2013, *Measuring relays and protection equipment – Part 27: Product safety requirements*

IEC 60417, *Graphical symbols for use on equipment*. Available from <<http://www.graphical-symbols.info/equipment>>

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60664-1, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60695-11-10, *Fire hazard testing – Part 11-10: Test flames – 50 W horizontal and vertical flame test methods*

IEC 60825-1, *Safety of laser products – Part 1: Equipment classification and requirements*

IEC 60990:1999, *Methods of measurement of touch current and protective conductor current*

IEC 61000-4-2:2008, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3:2008, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*

IEC 61000-4-4:2004, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*

IEC 61000-4-5:2005, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*

IEC 61000-4-6:2008, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

IEC 61000-4-8:2001, *Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test*

IEC 61000-4-11:2004, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests*

IEC 61000-4-16:2002, *Electromagnetic compatibility (EMC) – Part 4-16: Testing and measurement techniques – Test for immunity to conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz*

IEC 61000-4-17:2009, *Electromagnetic compatibility (EMC) – Part 4-17: Testing and measurement techniques – Ripple on d.c. input power port immunity test*

IEC 61000-4-18:2006, *Electromagnetic compatibility (EMC) – Part 4-18: Testing and measurement techniques – Damped oscillatory wave immunity test*

IEC 61000-4-29:2000, *Electromagnetic compatibility (EMC) – Part 4-29: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests*

IEC 61010-1:2010, *Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements*

IEC 61180-1:1992, *High-voltage test techniques for low voltage equipment – Part 1: Definitions, test and procedure requirements*

IEC 61180-2, *High-voltage test techniques for low-voltage equipment – Part 2: Test equipment*

IEC 61850 (all parts), *Communication networks and systems in substations*

IEC/TS 61850-2:2003, *Communication networks and systems in substations – Part 2: Glossary*

IEC 62271-1, *High-voltage switchgear and controlgear – Part 1: Common specifications*

CISPR 22:2008, *Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement*

CISPR 24:2010, *Information technology equipment – Immunity characteristics – Limits and methods of measurement*

ISO 780:1997, *Packaging – Pictorial marking for handling of goods*

ISO 7000, *Graphical symbols for use on equipment – Registered symbols*. Available from <<http://www.graphical-symbols.info/equipment>>

ISO 9772, *Cellular plastics – Determination of horizontal burning characteristics of small specimens subjected to a small flame*

IEEE 1613:2009, *IEEE standard environmental and testing requirements for communications networking devices installed in electric power substations*

### **3 Terms, definitions and abbreviations**

#### **3.1 Terms and definitions**

For the purposes of this document, the terms and definitions given in IEC 61850-2, as well as the following, apply.

##### **3.1.1**

###### **accessible part**

part which can be touched in normal operational use with a standard rigid or jointed test finger as specified in IEC 60529

Note 1 to entry: Accessible in normal operational use applies mainly to the front of the equipment only, for the purposes of this standard.

Note 2 to entry: A communication circuit/network, which may be connected and taken outside of the cubicle housing, the equipment, or on the front of the panel without the need to open a cover or flap to access it, should be considered to be accessible, i.e. should be PEB, PELV, SELV or equivalent.

[SOURCE: IEC 60050-442:1998, 442-01-15, modified — Notes 1 and 2 to entry have been added.]

##### **3.1.2**

###### **adjacent circuits**

electric circuits which are separated from the considered circuit by the necessary basic or double/reinforced insulation

Note 1 to entry: Circuits which are separated by far more than double or reinforced insulation are not considered to be adjacent.

[SOURCE: IEC 60255-27:2013, 3.2]