

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Specification for the testing of balanced and coaxial information technology cabling –
Part 1: Installed balanced cabling as specified in ISO/IEC 11801-1 and related standards**

**Spécification relative aux essais des câblages symétriques et coaxiaux des technologies de l'information –
Partie 1: Câblages symétriques installés selon les spécifications de l'ISO/IEC 11801-1 et des normes connexes**



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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.120.10

ISBN 978-2-8322-7301-2

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SPECIFICATION FOR THE TESTING OF BALANCED AND
COAXIAL INFORMATION TECHNOLOGY CABLING –****Part 1: Installed balanced cabling as specified
in ISO/IEC 11801-1 and related standards**

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International Standard IEC 61935-1 has been prepared by IEC technical committee 46: Cables, wires, waveguides, RF connectors, RF and microwave passive components and accessories.

This fifth edition cancels and replaces the fourth edition, published in 2015. This edition constitutes a technical revision.

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

- a) the upper frequency goes up to 2 000 MHz;
- b) it introduces a new level of field tester (level VI to 2 000 MHz);
- c) error models and requirements for level VI testers are improved and updated.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
46/725/FDIS	46/730/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.

A list of all parts in the IEC 61935 series, published under the general title *Specification for the testing of balanced and coaxial information technology cabling*, can be found on the IEC website.

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INTRODUCTION

Telecommunication cabling, once specified uniquely by each telecommunications application, has evolved into a generic cabling system. Telecommunications applications now use the ISO/IEC 11801-1 cabling standard to meet their cabling requirements. Formerly, connectivity tests and visual inspection were deemed sufficient to verify a cabling installation. Now users need more comprehensive testing in order to ensure that the link will support telecommunications applications that are designed to operate on the generic cabling system. This part of IEC 61935 addresses reference laboratory and field test methods and provides a comparison of these methods.

Transmission performance depends on cable characteristics, connecting hardware, patch cords and cross-connect cabling, the total number of connections and the care with which they are installed and maintained. IEC 61935 (all parts) provides test methods for installed cabling and pre-fabricated cable assemblies. These test methods, where appropriate, are based on those used for components of the cable assembly.

This Part 1 contains the test methods required for installed cabling. Part 1-1 provides requirements for the optional testing of TCL and ELTCTL. Part 1-2 provides requirements for the optional testing of resistance unbalance. Part 2 contains the test methods required for patch cords and work area cords.

SPECIFICATION FOR THE TESTING OF BALANCED AND COAXIAL INFORMATION TECHNOLOGY CABLING –

Part 1: Installed balanced cabling as specified in ISO/IEC 11801-1 and related standards

1 Scope

This part of IEC 61935 specifies reference measurement procedures for cabling parameters and the requirements for field tester accuracy to measure cabling parameters identified in ISO/IEC 11801-1.

This document applies when the cable assemblies are constructed of cables complying with IEC 61156 (all parts), and connecting hardware as specified in IEC 60603-7 (all parts) or IEC 61076-3-104, IEC 61076-3-110, IEC 61076-2-101 and IEC 61076-2-109. Where cables and/or connectors do not comply with these standards, then additional tests may be required.

This document is organized as follows:

- reference laboratory measurement procedures on cabling topologies are specified in Clause 4. In some cases, these procedures may be used in the field (see IEC TR 61156-1-2:2009/AMD1:2014);
- descriptions and requirements for measurements in the field are specified in Clause 5;
- performance requirements for field testers and procedures to verify performance are specified in Clause 6.

NOTE 1 This document does not include tests that are normally performed on the cables and connectors separately. These tests are described in IEC 61156-1 and IEC 60603-7 or IEC 61076-3-104, IEC 61076-3-110, IEC 61076-2-101 and IEC 61076-2-109, respectively.

NOTE 2 Wherever possible, cables and connectors used in cable assemblies, even if they are not described in IEC 61156 or IEC 60603-7, IEC 61076-3-104, IEC 61076-3-110, IEC 61076-2-101 and IEC 61076-2-109, are tested separately according to the tests given in the relevant generic specification. In this case, most of the environmental and mechanical tests described in this standard can be omitted.

This document relates to performance with respect to 100 Ω cabling. For 120 Ω or 150 Ω cabling, the same principles apply but the measurement system should correspond to the nominal impedance level.

Field tester types include certification, qualification and verification. Certification testing is performed for the rigorous needs of commercial/industrial buildings to this document. Qualification testing is described in IEC 61935-3. Qualification testing determines whether the cabling will support certain network technologies (e.g. 1000BASE-T, 100BASE-TX, 10G Base-T). Qualification testers do not have traceable accuracy to national standards and only provide confidence that specific applications will work. Verification testers only verify connectivity.

Throughout this document, 4-pair cabling is assumed. The test procedures described in this document may also be used to evaluate one or two pair balanced cabling. However, 2-pair cabling links that share the same sheath with other links are tested as 4-pair cabling.