# ISO/IEC TR 11801-9910

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# TECHNICAL REPORT

## Information technology – Generic cabling for customer premises – Part 9910: Specifications for modular plug terminated link cabling



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# INFORMATION TECHNOLOGY – GENERIC CABLING FOR CUSTOMER PREMISES –

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ISO/IEC TR 11801-9910, which is a Technical Report, was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

The list of all currently available parts of the ISO/IEC 11801 series, under the general title *Information technology – Generic cabling for customer premises*, can be found on the IEC and ISO websites.

The text of this Technical Report is based on the following documents:

| DTR | Report on voting |
|---|---|
| JTC1-SC25/2924/DTR | JTC1-SC25/2941/RVDTR |

Full information on the voting for the approval of this Technical Report 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.

# INTRODUCTION

This document provides definitions and examples of modular plug terminated links (MPTL). It provides performance specifications for Classes D, E, $E_A$, F, $F_A$, I and II modular plug terminated links that can also be used to verify the performance of field terminated modular plug connectors.

# INFORMATION TECHNOLOGY – GENERIC CABLING FOR CUSTOMER PREMISES –

# Part 9910: Specifications for modular plug terminated link cabling

## 1 Scope

This part of ISO/IEC 11801, which is a Technical Report, provides definitions for, and examples of, modular plug terminated link configurations.

This document provides performance specifications for Classes D, E, $E_A$, F, $F_A$, I and II modular plug terminated links.

Test methods are provided in Clause 8 and are specified in ISO/IEC 14763-4:–[1].

## 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.

ISO/IEC 11801-1, *Information technology – Generic cabling for customer premises – Part 1: General requirements*

## 3 Terms, definitions, abbreviated terms and symbols

### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 11801-1 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

**3.1.1**
**modular plug terminated link**
type of link terminated with a free connector (modular plug) on one end

### 3.2 Abbreviated terms

For the purposes of this document, the abbreviated terms given in ISO/IEC 11801-1 and the following apply.

MPTL modular plug terminated link



[1] To be published. Stage at the time of publication: ISO/IEC CDV 14763-4:2020.

### 3.3 Symbols

For the purposes of this document, the symbols given in ISO/IEC 11801-1 apply.

## 4 Specifications

The specifications for MPTLs assume the following.

a) The configurations and structure meet the specifications outlined in Clause 5 (see Figure 1).

b) The interfaces to the cabling meet the specifications of ISO/IEC 11801-1 with respect to mating interfaces and performance.

c) Installation is performed in accordance with ISO/IEC 14763-2.

d) The MPTL meets the specifications of Clause 6.

e) The performance of MPTLs as specified in Clause 6 supports the link specifications specified in ISO/IEC 11801-1. Performance can be achieved by one of the following when the additional connections are included in the test results:

   1) an MPTL design and implementation ensuring that the prescribed transmission performance is met;

   2) using compatible cabling components that meet the specifications of ISO/IEC 11801-1;

   3) performance testing to the specifications of Clause 6.

## 5 MPTL configuration

The 2-connection MPTL as shown in Figure 1 is applicable to cabling Classes D, E, $E_A$, F, $F_A$, I and II. The 3-connection MPTL as shown in Figure 1 is applicable only to cabling Classes D, E, $E_A$, F and $F_A$.

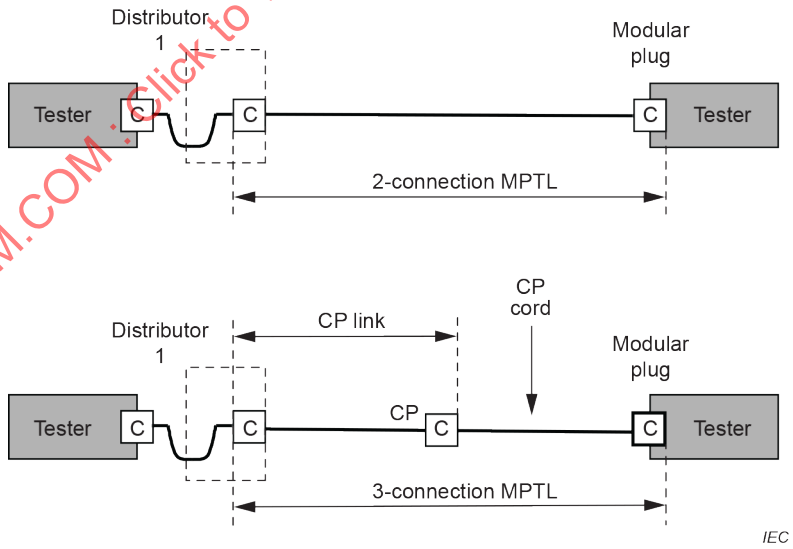


**Figure 1 – MPTL configurations**

# 6 Performance specifications

## 6.1 General

MPTL performance specifications are based on applicable 2-connection or 3-connection permanent link performance requirements for corresponding Classes as specified in ISO/IEC 11801-1:2017, Clause 7. These specifications are based on the modelling techniques described in ISO/IEC TR 11801-9903 using the balanced cabling components of Categories 5, 6, $6_A$, 7, $7_A$, 8.1 and 8.2 of ISO/IEC 11801-1:2017 to provide the specification for Classes D, E, $E_A$, F, $F_A$, I and II, respectively.

## 6.2 Return loss

Return loss performance for Classes D, E, $E_A$, F, $F_A$, I and II MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.2.

## 6.3 Insertion loss

Insertion loss performance for Classes D, E, $E_A$, F, $F_A$, I and II MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.3.

## 6.4 NEXT

NEXT performance for Classes D, E, $E_A$, F and $F_A$ MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.4.1, 3-connection link. NEXT performance for Classes I and II MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.4.1, 2-connection link.

## 6.5 PS NEXT

PS NEXT performance for Classes D, E, $E_A$, F and $F_A$ MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.4.2, 3-connection link. PS NEXT performance for Classes I and II MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.4.2, 2-connection link.

## 6.6 ACR-N

ACR-N performance for Classes D, E, $E_A$, F and $F_A$ MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.5.2, 3-connection link. ACR-N performance for Classes I and II MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.5.2, 2-connection link.

## 6.7 PS ACR-N

PS ACR-N performance for Classes D, E, $E_A$, F and $F_A$ MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.5.3, 3-connection link. PS ACR-N performance for Classes I and II MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.5.3, 2-connection link.

## 6.8 ACR-F

ACR-F performance for Classes D, E, $E_A$, F and $F_A$ MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.6.2, 3-connection link. ACR-F performance for Classes I and II MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.6.2, 2-connection link.

## 6.9 PS ACR-F

PS ACR-F performance for Classes D, E, $E_A$, F and $F_A$ MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.6.3, 3-connection link. PS ACR-F performance for Classes I and II MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.6.3, 2-connection link.

### 6.10 TCL

TCL performance for Classes D, E, $E_A$, F, $F_A$, I and II MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.11.2.

### 6.11 ELTCTL

ELTCTL performance for Classes D, E, $E_A$, F, $F_A$, I and II MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.11.3.

### 6.12 Coupling attenuation

Coupling attenuation performance for Classes D, E, $E_A$, F, $F_A$, I and II MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.11.4.

### 6.13 Alien (exogenous) crosstalk

Alien (exogenous) crosstalk performance for Classes $E_A$, F, $F_A$, I and II MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.12.

### 6.14 Direct current loop resistance

Direct current loop resistance for Classes D, E, $E_A$, F, $F_A$, I and II MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.7.

### 6.15 Direct current resistance unbalance

Direct current resistance unbalance within a pair and between pairs for Classes D, E, $E_A$, F, $F_A$, I and II MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.8.

### 6.16 Propagation delay

Propagation delay for Classes D, E, $E_A$, F, $F_A$, I and II MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.9.

### 6.17 Delay skew

Delay skew for Classes D, E, $E_A$, F, $F_A$, I and II MPTLs meet the requirements of ISO/IEC 11801-1:2017, 7.2.10.

## 7 MPTL cabling performance

### 7.1 General

Performance testing can be undertaken either:

a) in a laboratory, where MPTLs contain cabling components in a specific design configuration; or

b) in the field, after installation, using field test equipment. This testing is independent from any specifications for acceptance testing and is specified in ISO/IEC 14763-2.

### 7.2 Reference performance testing

This testing is performed on a sample of installed cabling in a laboratory where an assessment against the specifications of this document is required. The assessment documentation should include details of the number of channels or cabling tested, test evaluation criteria, supplier's declarations and certification, laboratory accreditation and calibration certification.

This testing can also be used for the comparison of measurements performed with laboratory and field test instruments:

a) assessing cabling models in a laboratory environment;

b) assessing parameters that cannot be tested in an installation.

### 7.3 Installation performance testing

This testing is performed in accordance with Clause 8, on a complete installation of cabling in the field where an assessment against the specifications of this document is required.

### 7.4 Installation performance testing of MPTLs

Testing to determine performance with the specifications of Clause 6 is optional. Testing should be performed in the following cases:

a) MPTLs using components whose transmission performance is lower than that required in ISO/IEC 11801-1;

b) evaluation of cabling to determine its capacity to support a certain group of applications;

c) confirmation of performance of cabling designed in accordance with the reference implementation.

Table 1 contains the test regime for reference performance and installation performance.

**Table 1 – Test regime for reference performance and installation performance – MPTLs of Classes D, E, $E_A$, F, $F_A$, I and II**

| Transmission parameter [a] | Reference conformance testing | Installation conformance testing |
|---|---|---|
| Return loss | N | N |
| Insertion loss | N | N |
| Pair-to-pair NEXT | N | N |
| PS NEXT | C | C |
| Pair-to-pair ACR-N | C | C |
| PS ACR-N | C | C |
| Pair-to-pair ACR-F | N | N |
| PS ACR-F | C | C |
| Direct current (DC) loop resistance | N | N |
| Direct current (DC) resistance unbalance within a pair | N | O |
| Direct current (DC) resistance unbalance between pairs | N | O |
| Propagation delay | N | N |
| Delay skew | N | N |
| Unbalance attenuation, near-end (TCL) | N | O |
| Unbalance attenuation, far-end (ELTCTL) | N | O |
| Coupling attenuation | N | O |
| PS ANEXT | N | $N_S$ |
| $PS\ ANEXT_{avg}$ | C | C |
| PS AACR-F | N | $N_S$ |
| $PS\ AACR\text{-}F_{avg}$ | C | C |
| Wire-map | N | N |
| Continuity:<br>• signal conductors;<br>• screen conductors (if present);<br>• short circuits;<br>• open circuits. | N | N |
| Length [b] | I | I |

C is calculated with pass/fail criteria.

I is informative testing without pass/fail criteria, if not met by design.

N is normative (100 %) testing with pass/fail criteria, if not met by design.

$N_S$ is normative (sampled) testing, if not met by design. The sample size to be tested should be in accordance with ISO/IEC 14763-2.

O is optional testing with pass/fail criteria, if not met by design.

NOTE The term "met by design" refers to a requirement which can be met by the selection of appropriate materials and installation techniques.

[a] Only those parameters specified for each Class of cabling need to be tested, as required in Clause 6.

[b] Length is not a pass/fail criterion.