# ISO/IEC 11801-3

Edition 1.0 2021-04

# INTERNATIONAL STANDARD

AMENDMENT 1

**Information technology – Generic cabling for customer premises – Part 3: Industrial premises**



ISO/IEC 11801-3:2017-11/AMD1:2021-04(en)

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AMENDMENT 1

## Information technology – Generic cabling for customer premises – Part 3: Industrial premises



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# INFORMATION TECHNOLOGY – GENERIC CABLING FOR CUSTOMER PREMISES –

## Part 3: Industrial premises

## AMENDMENT 1

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Amendment 1 to ISO/IEC 11801-3 has been prepared by subcommittee SC 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

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

| FDIS | Report on voting |
|---|---|
| JTC1-SC25/2995/FDIS | JTC1-SC25/3009/RVD |

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Amendment is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1, available at www.iec.ch/members_experts/refdocs.

# INTRODUCTION TO THE AMENDMENT

This document contains requirements and/or recommendations for deployment of single pair balanced cabling on the industrial cabling specified in ISO/IEC 11801-3:2017.

This document also includes end-to-end link requirements for Class D, E and $E_A$.

# INTRODUCTION

*Add the following NOTE below the Figure 1 title:*

NOTE Telecommunications infrastructure affects raw material consumption. The infrastructure design and installation methods also influence product life and sustainability of electronic equipment life cycling. These aspects of telecommunications infrastructure impact our environment. Since building life cycles are typically planned for decades, technological electronic equipment upgrades are necessary. The telecommunications infrastructure design and installation process magnifies the need for sustainable infrastructures with respect to building life, electronic equipment life cycling and considerations of effects on environmental waste. Telecommunications designers are encouraged to research local building practices for a sustainable environment and conservation of fossil fuels as part of the design process.

## 2 Normative references

*Add the following normative references:*

IEC 63171-6, *Connectors for electrical and electronic equipment – Part 6: Detail specification for 2-way and 4-way (data/power), shielded, free and fixed connectors for power and data transmission with frequencies up to 600 MHz*

IEC 61156-11, *Multicore and symmetrical pair/quad cables for digital communications – Part 11: Symmetrical single pair cables with transmission characteristics up to 600 MHz – Horizontal floor wiring – Sectional specification*

IEC 61156-12[1], *Multicore and symmetrical pair/quad cables for digital communications – Part 12: Symmetrical single pair cables with transmission characteristics up to 600 MHz – Work area wiring*

*Replace the ISO/IEC 14763-4 reference with the following new reference:*

ISO/IEC 14763-4, *Information technology – Implementation and operation of customer premises cabling – Part 4: Measurement of end-to-end (E2E) links, modular plug terminated links (MPTL) and direct attach cabling*

## 3 Terms, definitions, abbreviated terms and symbols

### 3.1 Terms and definitions

*Add the following terms and definitions at the end of the list:*

**3.1.14**
**balanced 1-pair cabling channel**
transmission path between equipment constructed from balanced 1-pair cables, balanced 1-pair connectors and balanced 1-pair cable assemblies to facilitate signal and power delivery

**3.1.15**
**edge distributor**
optional additional distributor to accommodate active equipment to allow transition from balanced 4-pair cabling to balanced 1-pair cabling

[1] Under preparation. Stage at time of publication: IEC CDV 61156-12:2020.

**3.1.16**
**end-to-end link**
transmission path between equipment including the end connections attached to the equipment

**3.1.17**
**bulkhead connection**
connection that serves as an interconnection point located through an enclosure wall

**3.1.18**
**segment**
cabling between connectors of an end-to-end link

### 3.2 Abbreviated terms

*Add the following abbreviated terms at the end of the list:*

| | |
|---|---|
| B | bulkhead connection |
| C | connection |
| CP | consolidation point |
| ED | edge distributor |
| ffs | for further study |
| L1 | length of end-to-end link |
| SPE | Single Pair Ethernet |
| TI | test interface |

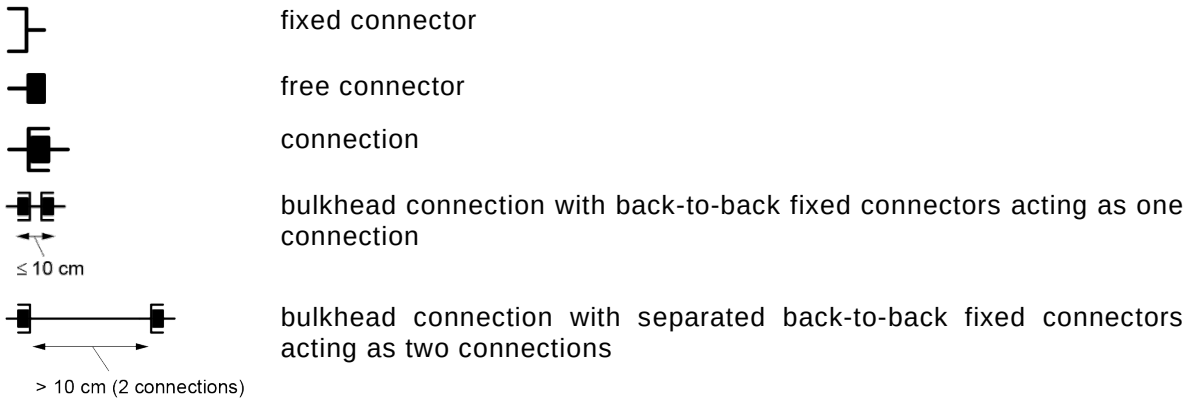


### 3.3 Symbols

*Replace subclause 3.3 with the following:*

Symbols used identically in different parts of ISO/IEC 11801 are defined in ISO/IEC 11801-1:2017, 3.3.






The symbols shown in Figure 14 define the number of connections in all end-to-end links.

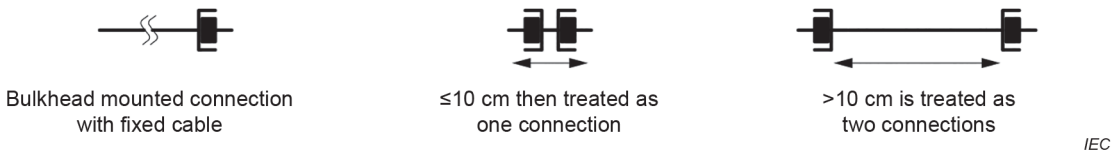



**Figure 14 – Symbols for bulkhead connections**

NOTE Bulkhead mounted connections with fixed cable can have a variable length to accommodate the installation within the cabinet.

## 4 Conformance

*Add the following list items:*

f) in case balanced 1-pair cabling channels are installed between the IID or ED and the NI of an Automation Island, between the IID or ED and the TO or AO, or between the IID and ED, channels shall conform to the requirements of Annex A;

g) in case balanced 1-pair cabling channels are installed between the ID and the NI of an Automation Island, channels shall conform to the requirements of Annex E.

### 5.3.1 General structure

*Replace list item a) with the following:*

a) Annex A describes the combined cabling structure of generic and industrial cabling system to connect several AIs via an ID to support critical process control, monitoring and automation data (PCMA).

### 5.3.3 Floor cabling subsystem

*Replace list item b) with the following:*

b) the mechanical termination of the floor cables including the connecting hardware (e.g. of interconnect or cross-connect) at the FD together with associated patch cords and/or jumpers, and any passive connections to the IDs.



### 5.6.2 Channels and permanent links

*Add the following new paragraph after the first paragraph of 5.6.2:*

The transmission performance of balanced 1-pair cabling between specific test interfaces is detailed in Annex E for channels.



### 5.7.2 Distributors

*Replace the existing Table 1 with the following new table:*

**Table 1 – Link lengths equations**

| Channel | Length<br>m |
|---|---|
| Intermediate [a] | 40 |
| Intermediate | 100 |
| Intermediate [b] | 1 000 |
| Intermediate + horizontal + building backbone + campus backbone | 10 000 |
| NOTE In some implementations of the intermediate cabling subsystem in Clause 8, the ID might not support TOs up to the maximum distance shown.<br>[a] for 40 m balanced 1-pair cabling<br>[b] for 1 000 m balanced 1-pair cabling | |

### 5.7.6 Telecommunications outlet

*Add the following to item c) after the second bullet point:*

or

- 1-pair of a 1-pair balanced cable;

### 6.1 General

*Delete the sixth and seventh paragraphs.*

*In the paragraph immediately following Figure 10, delete the word "only".*

#### 6.3.2.3 Intermediate cabling

*Add the following new paragraphs after the first paragraph:*

Generic balanced 1-pair cabling shall comply with the channel performance as required by Annex C and ISO/IEC 11801-1.

For the applications specified in Annex E, 1-pair cabling shall comply with the channel performance as required by Annex C and Annex E.

#### 6.3.2.4 Cable sharing



*Add the following new paragraph after the first paragraph:*

In the case of cable sharing by using balanced 1-pair cabling channels, additional requirements shall be taken into account for balanced cabling in accordance with ISO/IEC 11801-1 and ISO/IEC TR 11801-9906:2020, Annex D.

### 7.2 Balanced cabling



*Add the following new paragraphs after the first paragraph:*

Generic balanced 1-pair cabling shall comply with the link performance as required by Annex C and ISO/IEC 11801-1.

For the applications specified in Annex E, 1-pair cabling shall comply with the link performance as required by Annex C and Annex E.

### 8.1 General

*Add the following after "Clause 6" at the end of the second sentence:*

" or performance requirements of Annex E in case balanced 1-pair cabling is installed."

### 8.2.1 General

*Add the following new sentence after the first sentence:*

In the case of already installed balanced 1-pair cabling channels for up to 1 000 m the performance shall be ensured.

### 8.2.2.1 Component choice

*Add the following at the end of the subclause:*

Using the configurations of 8.2.2.3,

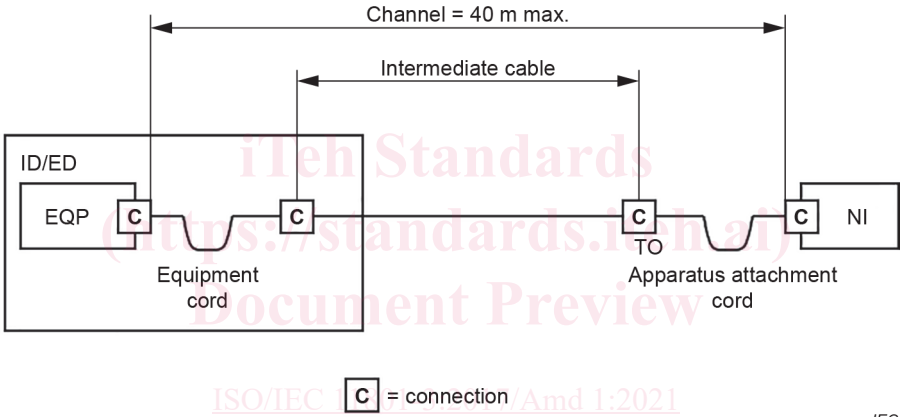
– cables in accordance with IEC 61156-11 and IEC 61156-12 and connectors in accordance with IEC 63171-6 provide cabling performance to the 600 MHz 40 m balanced 1-pair channel of Annex E;

NOTE Cables in accordance with two future parts of IEC 61156 (IEC 61156-13 and IEC 61156-14) and connectors in accordance with IEC 63171-6 will provide cabling performance to the 20 MHz 1 000 m balanced 1-pair channel of Annex E.

*Add the following new subclause after 8.2.2.2:*

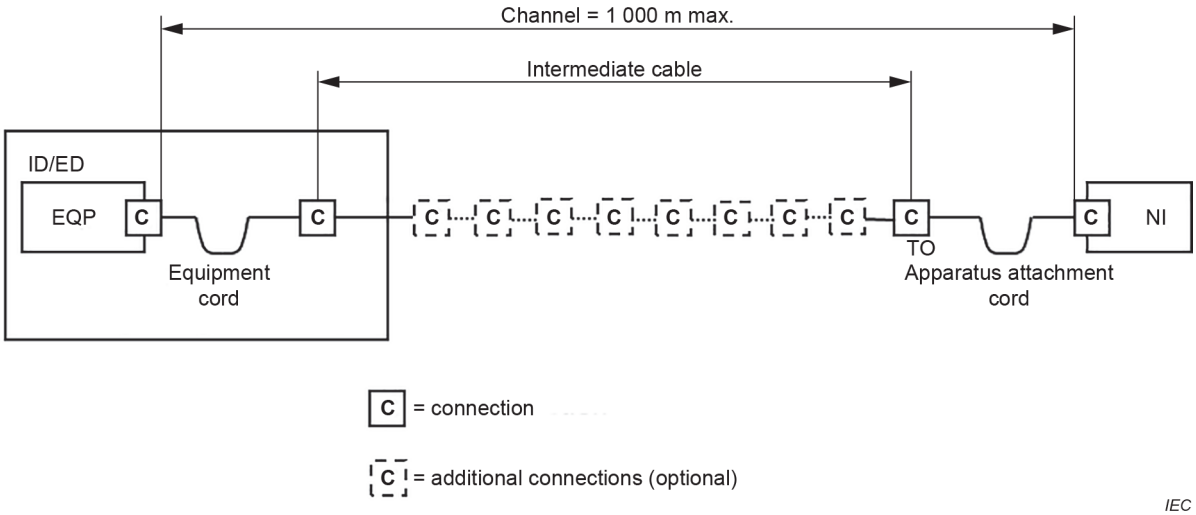
### 8.2.2.3 Balanced 1-pair cabling dimensions

Figure 15a) shows a 40 m balanced 1-pair channel (40 m interconnect – TO model). Figure 15b) shows a 1 000 m balanced 1-pair channel (1 000 m interconnect – TO model).






**a) Interconnect – TO model balanced 1-pair cabling channel 40 m**




**b) Interconnect – TO model balanced 1-pair cabling channel 1 000 m with up to 10 connections**

**Figure 15 – Balanced 1-pair intermediate cabling models**

Table 5 and Table 6 contain the length assumptions of the 40 m and the 1 000 m, respectively, balanced 1-pair intermediate cabling.

**Table 5 – Length assumptions used in mathematical modelling of the 40 m balanced 1-pair intermediate cabling**

| Segment | Length m | |
|---|---|---|
| | minimum | maximum |
| ID – TO (no CP) [a] | 5 | 34 |
| Apparatus attachment cord | 1 | 3 |
| Equipment cord | 1 | 3 |
| All cords | – | 6 |

[a] Either consists of 34 m cabling and two 3 m cords or can be an end-to-end link configuration (but end-to-end links do not include a TO).

**Table 6 – Length assumptions used in mathematical modelling of the 1 000 m balanced 1-pair intermediate cabling**

| Segment | Length m | |
|---|---|---|
| | minimum | maximum |
| ID – TO (no CP) [a] | 15 | 990 |
| Apparatus attachment cord | 1 | 5 |
| Equipment cord | 1 | 5 |
| All cords | – | 10 |

[a] Allows up to two 5 m cords.



In order to accommodate cables used for apparatus attachment cords, patch cords, jumpers and equipment cords with different insertion loss, the length of the cables used within a channel shall be determined by the equations shown in Table 7.



**Table 7 – Balanced 1-pair intermediate link length equations**

| Model | Figure | Implementation equation | |
|---|---|---|---|
| | | new T1 class for 600 MHz 40 m channel | new T1 class for 20 MHz 1 000 m channel |
| Interconnect – TO (1-pair, 40 m) | 15a | ffs | not applicable |
| Interconnect – TO (1-pair, 1 000 m) | 15b | not applicable | ffs |
| $l_i$ maximum length of the intermediate cable (m)<br>$l_a$ combined length of patch cords/jumpers, equipment and apparatus attachment cords (m)<br>$X$ ratio of cord cable insertion loss (dB/m) to fixed horizontal cable insertion loss (dB/m) | | | |
| For operating temperatures above 20 °C, $l_i$ should be reduced by 0,2 % per °C for screened cables; 0,4 % per °C (20 °C to 40 °C) and 0,6 % per °C (> 40 °C to 60 °C) for unscreened cables. | | | |

## 9.2 Balanced cables

*Add the following new sentence and NOTE after the first sentence:*

For balanced 1-pair cables with transmission characteristics up to 600 MHz, see IEC 61156-11 and IEC 61156-12.