

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



AMENDMENT 2  
AMENDEMENT 2

**Industrial communication networks – Installation of communication networks in industrial premises**

**Réseaux de communication industriels – Installation de réseaux de communication dans des locaux industriels**

[IEC 61918:2018/AMD2:2024](https://standards.iteh.ai/catalog/standards/iec/bad2b53e-6dac-405f-a8e6-bc846787ce27/iec-61918-2018-amd2-2024)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL COMMUNICATION NETWORKS – INSTALLATION  
OF COMMUNICATION NETWORKS IN INDUSTRIAL PREMISES**

**AMENDMENT 2**

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Amendment 2 to IEC 61918:2018 and to IEC 61918:2018/AMD1:2022 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation.

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

|               |                  |
|---------------|------------------|
| Draft         | Report on voting |
| 65C/1282/FDIS | 65C/1290/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 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications/](http://www.iec.ch/publications/).

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## iTeh Standards

### INTRODUCTION to Amendment 2

This Amendment 2 describes the result of the maintenance activity of IEC 61918:2018 that takes into account the evolution of the technology, which is being considered during the Installation Profiles revision cycle.

The following technical changes were made in IEC 61918:2018/AMD1:2022 and IEC 61918:2018/AMD2:2024:

- Subclauses 4.1.2, 4.1.3, 4.2.1.2, 4.2.2, 4.2.3.2, 4.3.2.1, 4.3.2.3, 4.4.1.2.1, 4.4.2.2, 4.4.2.5, 4.4.3.1, 4.4.3.2.1, 4.4.3.4.1, 4.4.7.1.4, 4.4.7.3.1, 5.1.1, 5.7, 6.1, 6.2.8.3, 6.3.2.1.2 and 8.3.3 have been updated;
- Annex O has been modified by replacing the references to ISO/IEC TR 11801-9902 with references to ISO/IEC 11801-3:2017/AMD1:2021;
- Table B.3 has been updated;
- Clause B.6 has been added;
- Annexes D, I, J, K and M have been updated;
- Annex Q has been added.

## 1 Scope

*Delete the existing fifth paragraph of the Scope.*

## 2 Normative references

*Delete the following reference:*

IEC 60603 (all parts), *Connectors for electronic equipment*

*Add the following new references:*

IEC 61076-2-104, *Connectors for electronic equipment – Product requirements – Part 2-104: Circular connectors – Detail specification for circular connectors with M8 screw-locking or snap-locking*

IEC 61076-2-114, *Connectors for electrical and electronic equipment – Product requirements – Part 2-114: Circular connectors – Detail specification for connectors with M8 screw-locking with power contacts and signal contacts for data transmission up to 100 MHz*

IEC 61076-3-122, *Connectors for electrical and electronic equipment – Product requirements – Part 3-122: Detail specification for 8-way, shielded, free and fixed connectors for I/O and data transmission with frequencies up to 500 MHz and current-carrying capacity in industrial environments*

IEC 61076-3-124, *Connectors for electrical and electronic equipment – Product requirements – Part 3-124: Rectangular connectors – Detail specification for 10-way, shielded, free and fixed connectors for I/O and data transmission with frequencies up to 500 MHz*

IEC 61156-13:2023, *Multicore and symmetrical pair/quad cables for digital communications – Part 13: Symmetrical single pair cables with transmission characteristics up to 20 MHz – Horizontal floor wiring – Sectional specification*

*Replace the existing reference to IEC 61158-2:2014 with the following new reference:*

IEC 61158-2:2023, *Industrial communication networks – Fieldbus specifications – Part 2: Physical layer specification and service definition*

*Replace the existing reference to IEC 61784-1:— with the following new reference:*

IEC 61784-1-x, *Industrial networks – Profiles – Part 1-x: Fieldbus profiles*

*Replace the existing reference to IEC 61784-2:— with the following new reference:*

IEC 61784-2-x, *Industrial networks – Profiles – Part 2-x: Additional real-time fieldbus profiles based on ISO/IEC/IEEE 8802-3*

*Add the following new references:*

IEC 63171-2:2021, *Connectors for electrical and electronic equipment – Part 2: Detail specification for 2-way, shielded or unshielded, free and fixed connectors: mechanical mating information, pin assignment and additional requirements for type 2*

IEC 63171-5:2022, *Connectors for electrical and electronic equipment – Part 5: Detail specification for 2-way M8 and M12 circular connectors, shielded or unshielded, free and fixed – Mechanical mating information, pin assignment and additional requirements for type 5*

Delete the following reference:

ISO/IEC TR 11801-9902:2017, *Information technology – Generic cabling for customer premises – Part 9902: Specifications for End-to-end link configurations*

Replace the existing references to ISO/IEC 14763-2:2012 and ISO/IEC 14763-2:2012/AMD1:2015 with the following new reference:

ISO/IEC 14763-2:2019, *Information technology – Implementation and operation of customer premises cabling – Part 2: Planning and installation*

Replace the existing reference to ISO/IEC 14763-3:2014 with the following new references:

ISO/IEC 14763-3:2014, *Information technology – Implementation and operation of customer premises cabling – Part 3: Testing of optical fibre cabling*  
ISO/IEC 14763-3:2014/AMD1:2018

Replace the existing reference to ISO/IEC 14763-4:2018 with the following new reference:

ISO/IEC 14763-4:2021, *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*

Add the following new references:

ISO/IEC TS 29125:2017/AMD1:2020, *Information technology – Telecommunications cabling requirements for remote powering of terminal equipment*

Replace the existing reference to IEEE Std 802.3-2015 and the reference to IEEE Std 802.3cg added by IEC 61918:2018/AMD1:2022 with the following new reference and notes:

IEEE Std 802.3-2022, *Standard for Ethernet*, available at <http://www.ieee.org>

NOTE 1 The contents of IEEE Std 802.3cg have been integrated in IEEE Std 802.3-2022, Clause 146.

NOTE 2 Physical Layer specifications for 100BASE-T1 and 1000BASE-T1 are provided in IEEE Std 802.3-2022, Clause 96 and Clause 97 respectively.

## 4 Installation planning

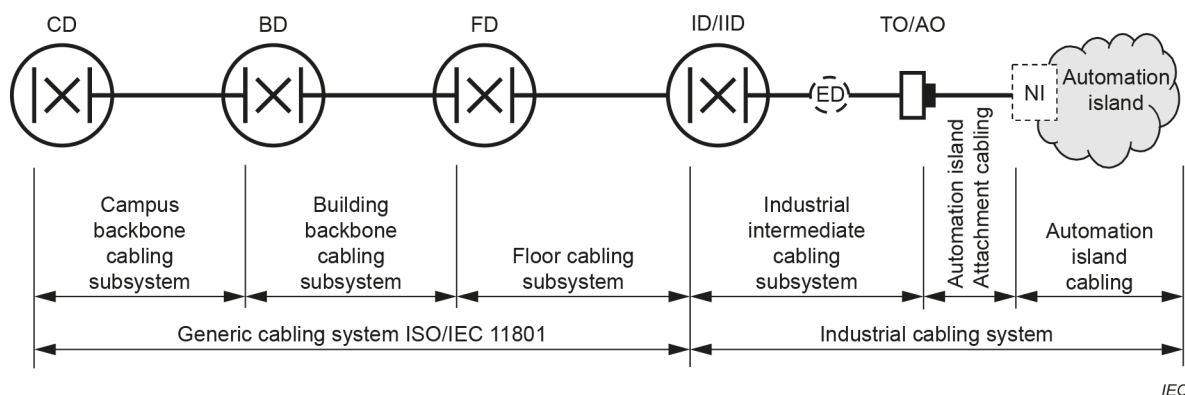
### 4.1.2 Cabling in industrial premises

Replace, in the first item of the first bulleted list, after "(all parts)", the comma added by IEC 61918:2018/AMD1:2022 with a semicolon.

Replace, in the second item of the second bulleted list, "ISO/IEC/IEEE 8802-3:2021 and IEEE Std 802.3cg" as amended by IEC 61918:2018/AMD1:2022 with "ISO/IEC/IEEE 8802-3".

**Figure 3 – Automation island cabling attached to elements of generic cabling**

Replace existing Figure 3 with the following new figure:



#### 4.2.2 Security

Replace, at the end of the first paragraph of 4.2.2, "requirements for security." with the following new text:

technical and organizational measures aimed at mitigating the specific security risk for the communication subset identified during the security design of the whole automation system.

Delete the EXAMPLE.

Replace the existing third paragraph of 4.2.2 with the following new text:

IEC 62443 breaks down the design of security within a system to security levels based on risk level. For each level there are different measures. For this purpose, cabling, planning and installation play a role in implementing countermeasures and are central to achieving physical and environmental security countermeasures, in accordance with Clause 4 and Clause 5, in general, and requirements described in 4.4.9.1 (Routing of cables), 4.4.9.6.(Installing redundant communication cables), 4.4.11 (Mechanical protection of cabling components), 5.2.1.2 (Protecting communication cables against potential mechanical damage), in particular.

Moreover, the first security level defined in IEC 62443 requires that a protection against unintentional failures be implemented. An important contribution to this protection comes from the application of the rules for installation verification and installation acceptance tests, installation administration and installation maintenance and troubleshooting, described in Clause 6, Clause 7 and Clause 8, which reduce the risk of intermittent system malfunction due to incorrect cabling (e.g. insufficient implemented protection from electromagnetic interferences, instable connections, etc.).

#### 4.2.3.2 Use of the described environment to produce a bill of material

Add, after Figure 7, the following new text:

Passive optical components in the harsh industrial environment should be protected with suitable mitigation techniques or tested according to IEC 61753-1.



#### 4.3.1.4 Combination of basic topologies

Add, after Figure 10, the following new text and new Figure 53:

A mesh configuration is composed of linear configurations where the active nodes are partially (as in Figure 53, with one linear configuration in green and a second one in blue) or totally directly interconnected.

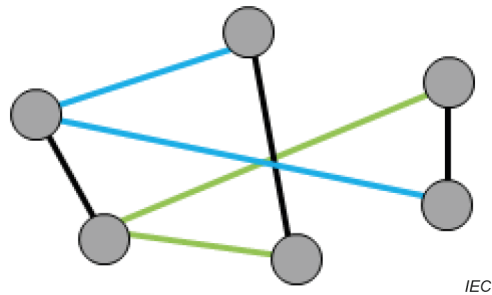


Figure 53 – Example of mesh topology

#### 4.4.1.4 Optical fibre cables

Replace, at the end of the fourth paragraph of 4.4.1.4, "IEC 60793-2-10: type A1a.3" with "IEC 60793-2-10, type A1a.3 (A1-OM4)".

#### 4.4.2.3 Connecting hardware for copper cabling CPs not based on Ethernet

Replace, in the NOTE to Table 8, "may" with "can".

#### 4.4.3.2.1 Common description

##### d) Balanced 1-pair cabling

Replace the existing bullet d) of 4.4.3.2.1 added by IEC 61918:2018/AMD1:2022 with the following new bullet d):

##### d) Balanced 1-pair reference implementation and cabling

For 1-pair reference implementation and cabling, the requirements specified in Annex Q apply.

#### Figure 43 – Pin and pair grouping assignments for two eight position IEC 60603-7 subparts and four position IEC 60603 series to IEC 61076-2-101 connectors

Replace the existing title of Figure 43 with the following new title:

#### Figure 43 – Pin and pair grouping assignments for two eight position IEC 60603-7 subparts and four position IEC 60603-7 series to IEC 61076-2-101 connectors

## Annex D Connector tables

Replace, in the third paragraph of Annex D, "to Table D.13" with "to Table D.15".

Replace, in the fourth paragraph of Annex D, at the end of bullet a), " – " with " - ".

Add, in the bullet list of CPF, at the end of the CPF 8 bullet, the following new text:

and CP 8/6 (CC-Link IE TSN)

Add, in the bullet list of CPF, at the end of the CPF 19 bullet, the following new text:

, CP 19/3 ( $\Sigma$ -LINK II) and CP 19/4 (MECHATROLINK-4)

Add, at the end of the bullet list of CPF, the following new bullet:

- **CPF 22** (AUTBUS): CP 22/1 (AUTBUS).

**Table D.3 – 8-way modular connector**

Replace existing Table D.3 with the following new table:

| CP   | Pin            |    |    |   |   |    |   |   | Housing |
|--|----------------|----|----|---|---|----|---|---|---------|
|  | 1              | 2  | 3  | 4 | 5 | 6  | 7 | 8 |         |
| CP 1/1   | -              | -  | -  | - | - | -  | - | - | -       |
| CP 1/2   | T568A or T568B |    |    |   |   |    |   |   | Drain   |
| CP 2/1   | -              | -  | -  | - | - | -  | - | - | -       |
| CP 2/2   | T568A or T568B |    |    |   |   |    |   |   | Drain   |
| CP 2/3   | -              | -  | -  | - | - | -  | - | - | -       |
| CP 3/1   | -              | -  | -  | - | - | -  | - | - | -       |
| CP 3/2   | -              | -  | -  | - | - | -  | - | - | -       |
| CP 3/3 <sup>a</sup><br>CP 3/4 <sup>a</sup><br>CP 3/5 <sup>a</sup><br>CP 3/6 <sup>a</sup> | YE             | OG | WH | - | - | BU | - | - | Drain   |
| CP 4/1   | -              | -  | -  | - | - | -  | - | - | -       |
| CP 4/3   | T568A or T568B |    |    |   |   |    |   |   | Drain   |
| CP 6/1<br>CP 6/3   | -              | -  | -  | - | - | -  | - | - | -       |
| CP 6/2   | T568B          |    |    |   |   |    |   |   | Drain   |
| CP 8/1<br>CP 8/2   | -              |    |    |   |   |    |   |   | -       |
| CP 8/3   | -              |    |    |   |   |    |   |   | -       |
| CP 8/4<br>CP 8/5<br>CP 8/6   | T568B          |    |    |   |   |    |   |   | Drain   |
| CP 10/1  | T568B          |    |    |   |   |    |   |   | Drain   |
| CP 11/1<br>CP 11/2   | T568B          |    |    |   |   |    |   |   | Drain   |
| CP 11/3  | -              | -  | -  | - | - | -  | - | - | -       |
| CP 12/1 <sup>b</sup><br>CP 12/2 <sup>b</sup>   | YE             | OG | WH | - | - | BU | - | - | Drain   |
| CP 13/1  | T568B          |    |    |   |   |    |   |   | Drain   |
| CP 14/1<br>CP 14/2   | T568B          |    |    |   |   |    |   |   | Drain   |
| CP 14/3  | -              | -  | -  | - | - | -  | - | - | -       |
| CP 15/1<br>CP 15/2   | T568A or T568B |    |    |   |   |    |   |   | Drain   |
| CP 16/1<br>CP 16/2   | -              |    |    |   |   |    |   |   | -       |
| CP 16/3  | YE             | OG | WH | - | - | BU | - | - | Drain   |
| CP 17/1  | T568B          |    |    |   |   |    |   |   | Drain   |
| CP 18/1<br>CP 18/2   | YE             | OG | WH | - | - | BU | - | - | Drain   |
| CP 19/1  | -              | -  | -  | - | - | -  | - | - | -       |
| CP 19/2 <sup>c</sup>   | BU             | WH | OG | - | - | YE | - | - | Drain   |
| CP 19/3  | -              | -  | -  | - | - | -  | - | - | -       |
| CP 19/4  | BU             | WH | OG | - | - | YE | - | - | Drain   |

| CP      | Pin            |   |   |   |   |   |   |   | Housing |
|---------|----------------|---|---|---|---|---|---|---|---------|
|         | 1              | 2 | 3 | 4 | 5 | 6 | 7 | 8 |         |
| CP 20/1 | T568A or T568B |   |   |   |   |   |   |   | Drain   |
| CP 20/2 |                |   |   |   |   |   |   |   |         |
| CP 21/1 | T568A or T568B |   |   |   |   |   |   |   | Drain   |
| CP 22/1 | -              |   |   |   |   |   |   |   |         |

<sup>a</sup> With four pair cabling, use T568A or T568B  
<sup>b</sup> With four pair cabling, use T568B  
<sup>c</sup> With crossover pairing pins: 1-3, 2-6, 3-1, 6-2.

**Table D.5 – M12-4 D-coding connector**

Replace existing Table D.5 with the following new table:

| CP      | Pin   |       |       |    |   | Housing |
|---------|-------|-------|-------|----|---|---------|
|         | 1     | 2     | 3     | 4  |   |         |
| CP 1/1  | -     | -     | -     | -  | - | -       |
| CP 1/2  | -     | -     | -     | -  | - | -       |
| CP 2/1  | -     | -     | -     | -  | - | -       |
| CP 2/2  | WH/OG | OG    | WH/GN | GN |   | Drain   |
| CP 2/3  | -     | -     | -     | -  | - | -       |
| CP 3/1  | -     | -     | -     | -  | - | -       |
| CP 3/2  | -     | -     | -     | -  | - | -       |
| CP 3/3  | YE    | WH    | OG    | BU |   | Drain   |
| CP 3/4  |       |       |       |    |   |         |
| CP 3/5  |       |       |       |    |   |         |
| CP 3/6  |       |       |       |    |   |         |
| CP 4/1  | -     | -     | -     | -  | - | -       |
| CP 4/3  | -     | -     | -     | -  | - | -       |
| CP 6/1  | -     | -     | -     | -  | - | -       |
| CP 6/3  | -     | -     | -     | -  | - | -       |
| CP 6/2  | WH/OG | OG    | WH/GN | GN |   | Drain   |
| CP 8/1  | -     | -     | -     | -  | - | -       |
| CP 8/2  | -     | -     | -     | -  | - | -       |
| CP 8/3  | -     | -     | -     | -  | - | -       |
| CP 8/4  | -     | -     | -     | -  | - | -       |
| CP 8/5  | -     | -     | -     | -  | - | -       |
| CP 8/6  | WH/OG | WH/GN | OG    | GN |   | Drain   |
| CP 10/1 | -     | -     | -     | -  | - | -       |
| CP 11/1 | -     | -     | -     | -  | - | -       |
| CP 11/2 |       |       |       |    |   |         |
| CP 11/3 |       |       |       |    |   |         |
| CP 12/1 | YE    | WH    | OG    | BU |   | Drain   |
| CP 12/2 |       |       |       |    |   |         |
| CP 13/1 | YE    | WH    | OG    | BU |   | Drain   |
| CP 14/1 | WH/OG | OG    | WH/GN | GN |   | Drain   |
| CP 14/2 |       |       |       |    |   |         |
| CP 14/3 | -     | -     | -     | -  | - | -       |
| CP 15/1 | WH/OG | OG    | WH/GN | GN |   | Drain   |
| CP 15/2 |       |       |       |    |   |         |
| CP 16/1 | -     | -     | -     | -  | - | -       |
| CP 16/2 | -     | -     | -     | -  | - | -       |
| CP 16/3 | YE    | WH    | OG    | BU |   | Drain   |
| CP 17/1 | -     | -     | -     | -  | - | -       |
| CP 18/1 | YE    | WH    | OG    | BU |   | Drain   |
| CP 18/2 |       |       |       |    |   |         |
| CP 19/1 | -     | -     | -     | -  | - | -       |