

Industrial networks - Profiles - Part 1-0: Fieldbus  
profiles - General concepts and terminology

## EESTI STANDARDI EESSÕNA

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|---|--|
| See Eesti standard EVS-EN IEC 61784-1-0:2023 sisaldab Euroopa standardi EN IEC 61784-1-0:2023 ingliskeelset teksti. | This Estonian standard EVS-EN IEC 61784-1-0:2023 consists of the English text of the European standard EN IEC 61784-1-0:2023.                        |
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English Version

Industrial networks - Profiles - Part 1-0: Fieldbus profiles -  
General concepts and terminology  
(IEC 61784-1-0:2023)

Réseaux industriels - Profils - Partie 1-0: Profils de bus de  
terrain - Concepts généraux et terminologie  
(IEC 61784-1-0:2023)

Industrielle Kommunikationsnetze - Profile - Teil 1-0:  
Feldbusprofile - Allgemeine Konzepte und Terminologie  
(IEC 61784-1-0:2023)

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## European foreword

The text of document 65C/1207/FDIS, future edition 1 of IEC 61784-1-0, prepared by SC 65C "Industrial networks" of IEC/TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61784-1-0:2023.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2024-01-28
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2026-04-28

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IEC 61158-1 NOTE Approved as EN IEC 61158-1  
IEC 61158-2 NOTE Approved as EN IEC 61158-2  
IEC 61158-3 (series) NOTE Approved as EN 61158-3 (series)  
IEC 61158-4 (series) NOTE Approved as EN 61158-4 (series)  
IEC 61158-5 (series) NOTE Approved as EN 61158-5 (series)  
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IEC 61784-2 (series) NOTE Approved as EN IEC 61784-2 (series)

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Industrial networks – Profiles –  
Part 1-0: Fieldbus profiles – General concepts and terminology**

**Réseaux industriels – Profils –  
Partie 1-0: Profils de bus de terrain – Concepts généraux et terminologie**



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# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

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**Industrial networks – Profiles –  
Part 1-0: Fieldbus profiles – General concepts and terminology**

**Réseaux industriels – Profils –  
Partie 1-0: Profils de bus de terrain – Concepts généraux et terminologie**

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**INDUSTRIAL NETWORKS –  
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General concepts and terminology****FOREWORD**

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NOTE Combinations of protocol types are specified in the IEC 61784-1 series and the IEC 61784-2 series.

IEC 61784-1-0 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation. It is an International Standard.

This first edition, together with the other parts of the same series, cancels and replaces the fifth edition of IEC 61784-1 published in 2019. This first edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC 61784-1:2019:

- a) split of the original IEC 61784-1 into several subparts, one subpart for the material of a generic nature, and one subpart for each Communication Profile Family specified in the original document;
- b) move most contents of the original scope into a new dedicated subclause;
- c) addition of a new Communication Profile Family (CPF 22).

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

| Draft         | Report on voting |
|---------------|------------------|
| 65C/1207/FDIS | 65C/1236/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 International Standard 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).

A list of all parts of the IEC 61784-1 series, published under the general title *Industrial networks – Profiles – Part 1: Fieldbus profiles*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

## INTRODUCTION

The IEC 61784-1 series provides a set of Communication Profiles (CP) in the sense of ISO/IEC TR 10000-1. These answer the need of identifying the protocol families co-existing within the IEC 61158 series, as a result of the international harmonization of fieldbus technologies available on the market. More specifically, these profiles help to correctly state the compliance with the IEC 61158 series, and to avoid the spreading of divergent implementations, which would limit its use, clearness and understanding. Additional profiles to address specific market concerns, such as functional safety or information security, can be addressed by future parts of the IEC 61784-1 series.

The IEC 61784-1 series contains several Communication Profile Families (CPF), which specify one or more communication profiles. Such profiles identify, in a strict sense, protocol subsets of the IEC 61158 series via protocol specific communication profiles. They do not define device profiles that specify communication profiles together with application functions needed to answer the need of a specific application ("application profiles").

It is agreed that these latter classes of profiles would facilitate the use of the IEC 61158 series of standards; the profiles defined in the IEC 61784-1 series are a necessary step to achieve that task.

It is also important to clarify that interoperability – defined as the ability of two or more network systems to exchange information and to make mutual use of the information that has been exchanged (see ISO/IEC TR 10000-1) – can be directly achieved on the same link only for those devices complying with the same communication profile.

Profiles contained in the IEC 61784-1 series are constructed of references to IEC 61158-2 and the IEC 61158-3, IEC 61158-4, IEC 61158-5 and IEC 61158-6 series, and other IS, TS or worldwide-accepted standards, as appropriate<sup>1</sup>. Each profile is required to reference at least one part of the IEC 61158 series in addition to IEC 61158-1.

Two or more Profiles, which are related to a common family, are specified within a "Communication Profile Family" (CPF).

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<sup>1</sup> International Standardised Profiles may contain normative references to specifications other than International Standards; see ISO/IEC JTC 1 N 4047: *The Normative Referencing of Specifications other than International Standards in JTC 1 International Standardized Profiles – Guidelines for ISP Submitters*.

## INDUSTRIAL NETWORKS – PROFILES –

### Part 1-0: Fieldbus profiles – General concepts and terminology

#### 1 Scope

The IEC 61784-1 series defines several Communication Profile Families (CPF). Each CPF specifies a set of protocol specific communication profiles (CPs) based primarily on the IEC 61158 series, to be used in the design of devices involved in communications in factory manufacturing and process control.

This part of IEC 61784-1 defines a common terminology for all CPFs and conventions to be used in the specification of the CPs. It also provides a compliance statement and an overview of the structure and contents of the CPFs in the IEC 61784-1 series.

NOTE The added value of the IEC 61784-1 series is explained in Annex A.

#### 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.

NOTE All parts of the IEC 61158 series, as well as the IEC 61784-1 series and the IEC 61784-2 series are maintained simultaneously. Cross-references to these documents within the text therefore refer to the editions as dated in this list of normative references.

IEC 61158 (all parts), *Industrial communication networks – Fieldbus specifications*

IEC 61784-1 (all parts), *Industrial networks – Profiles – Part 1: Fieldbus profiles*

IEC 61784-1-1:2023, *Industrial networks – Profiles – Part 1-1: Fieldbus profiles – Communication Profile Family 1*

IEC 61784-1-2:2023, *Industrial networks – Profiles – Part 1-2: Fieldbus profiles – Communication Profile Family 2*

IEC 61784-1-3:2023, *Industrial networks – Profiles – Part 1-3: Fieldbus profiles – Communication Profile Family 3*

IEC 61784-1-4:2023, *Industrial networks – Profiles – Part 1-4: Fieldbus profiles – Communication Profile Family 4*

IEC 61784-1-5:2023, *Industrial networks – Profiles – Part 1-5: Fieldbus profiles – Communication Profile Family 5*

IEC 61784-1-6:2023, *Industrial networks – Profiles – Part 1-6: Fieldbus profiles – Communication Profile Family 6*

IEC 61784-1-8:2023, *Industrial networks – Profiles – Part 1-8: Fieldbus profiles – Communication Profile Family 8*

IEC 61784-1-9:2023, *Industrial networks – Profiles – Part 1-9: Fieldbus profiles – Communication Profile Family 9*

IEC 61784-1-16:2023, *Industrial networks – Profiles – Part 1-16: Fieldbus profiles – Communication Profile Family 16*

IEC 61784-1-19:2023, *Industrial networks – Profiles – Part 1-19: Fieldbus profiles – Communication Profile Family 19*

IEC 61784-1-22:2023, *Industrial networks – Profiles – Part 1-22: Fieldbus profiles – Communication Profile Family 22*

### **3 Terms, definitions, abbreviated terms, symbols, and conventions**

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

For the purposes of this document, all terms and definitions provided in the IEC 61158 series apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

#### **3.2 Abbreviations and symbols**

##### **3.2.1 IEC 61158 abbreviations and symbols**

For the purposes of this document, all abbreviations and symbols defined in the IEC 61158 series apply. The following abbreviations, found within the IEC 61158 series, are repeated here for use by those who wish to understand the general structure of the IEC 61784-1 series without referring to the IEC 61158 series.

|       |                                |
|-------|--------------------------------|
| AL    | Application layer              |
| APDU  | Application protocol data unit |
| AR    | Application relationship       |
| ASE   | Application service element    |
| DL-   | Data-link layer (as a prefix)  |
| DLL   | Data-link layer                |
| DLSDU | Data-link service data unit    |
| PhL   | Physical layer                 |
| TPDU  | Transport protocol data unit   |

##### **3.2.2 Other abbreviations and symbols**

|     |                              |
|-----|------------------------------|
| CP  | communication profile        |
| CPF | communication profile family |
| MAU | medium attachment unit       |