ICS 35.100.20, 35.240.50 SLOVENSKÁ TECHNICKÁ NORMA Júl 2023

| STN | **Priemyselné siete<br>Profily<br>Časť 1-3: Profily prevádzkových zberníc<br>Skupina komunikačných profilov 3** | **STN<br>EN IEC 61784-1-3<br><br>18 4020** |
|---|---|---|

Industrial networks - Profiles - Part 1-3: Fieldbus profiles - Communication Profile Family 3

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 06/23

Táto norma čiastočne nahrádza normu STN EN IEC 61784-1 z októbra 2019. Súbežná platnosť do 26. 4. 2026.

Obsahuje: EN IEC 61784-1-3:2023, IEC 61784-1-3:2023

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN IEC 61784-1-3

April 2023

ICS 35.240.50; 35.100.20

Supersedes EN IEC 61784-1:2019 (partially)

English Version

# Industrial networks - Profiles - Part 1-3: Fieldbus profiles - Communication Profile Family 3 (IEC 61784-1-3:2023)

Réseaux industriels - Profils - Part 1-3: Profils de bus de terrain - Famille de profils de communication 3 (IEC 61784-1-3:2023)

Industrielle Kommunikationsnetze - Profile - Teil 1-3: Feldbusprofile - Kommunikationsprofilfamilie (CPF) 3 (IEC 61784-1-3:2023)

This European Standard was approved by CENELEC on 2023-04-26. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

# European foreword

The text of document 65C/1207/FDIS, future edition 1 of IEC 61784-1-3, 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 61784-1-3:2023.

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) 2024-01-26
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2026-04-26

This document, together with other parts of the same series, partially supersedes EN IEC 61784-1:2019 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

## Endorsement notice

The text of the International Standard IEC 61784-1-3:2023 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standard indicated:

| | |
|---|---|
| IEC 60079-14 | NOTE Approved as EN 60079-14 |
| IEC 60793 (series) | NOTE Approved as EN IEC 60793 (series) |
| IEC 61131-3 | NOTE Approved as EN 61131-3 |
| IEC 61158-1 | NOTE Approved as EN IEC 61158-1 |
| 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) |
| IEC 61158-5-10 | NOTE Approved as EN IEC 61158-5-10 |
| IEC 61158-6 (series) | NOTE Approved as EN 61158-6 (series) |
| IEC 61158-6-10 | NOTE Approved as EN IEC 61158-6-10 |
| IEC 61784-1 (series) | NOTE Approved as EN IEC 61784-1 (series) |
| IEC 61784-2 (series) | NOTE Approved as EN IEC 61784-2 (series) |

# Annex ZA
(normative)

## Normative references to international publications with their corresponding European publications

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 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

| Publication | Year | Title | EN/HD | Year |
|---|---|---|---|---|
| IEC 60079-11 | - | Electrical apparatus for explosive gas atmospheres - Part 11: Intrinsic safety "i" | EN 60079-11 | - |
| IEC 60079-25 | - | Explosive atmospheres - Part 25: Intrinsically safe electrical systems | EN IEC 60079-25 | - |
| IEC 61010 | series | Safety requirements for electrical equipment for measurement, control, and laboratory use | EN IEC 61010 | series |
| IEC 61131-2 | - | Industrial-process measurement and control - Programmable controllers - Part 2: Equipment requirements and tests | EN 61131-2 | - |
| IEC 61158 | series | Industrial communication networks - Fieldbus specifications | EN IEC 61158 | series |
| IEC 61158-2 | 2023 | Industrial communication networks - Fieldbus specifications - Part 2: Physical layer specification and service definition | EN IEC 61158-2 | 2023 |
| IEC 61158-3-3 | 2014 | Industrial communication networks - Fieldbus specifications - Part 3-3: Data-link layer service definition - Type 3 elements | EN 61158-3-3 | 2014 |
| IEC 61158-4-3 | 2019 | Industrial communication networks - Fieldbus specifications - Part 4-3: Data-link layer protocol specification - Type 3 elements | EN IEC 61158-4-3 | 2019 |
| IEC 61158-5-3 | 2014 | Industrial communication networks - Fieldbus specifications - Part 5-3: Application layer service definition - Type 3 elements | EN 61158-5-3 | 2014 |
| IEC 61158-6-3 | 2019 | Industrial communication networks - Fieldbus specifications - Part 6-3: Application layer protocol specification - Type 3 elements | EN IEC 61158-6-3 | 2019 |

**EN IEC 61784-1-3:2023 (E)**

| | | | | |
|---|---|---|---|---|
| IEC 61784-1-0 | 2023 | Industrial networks - Profiles - Part 1-0: Fieldbus profiles - General concepts and terminology | EN IEC 61784-1-0 | 2023 |
| IEC 61784-2-3 | 2023 | Industrial networks - Profiles - Part 2-3: Additional real-time fieldbus profiles based on ISO/IEC/IEEE 8802-3 - CPF 3 | EN IEC 61784-2-3 | 2023 |
| ISO 15745-3 | 2003 | Industrial automation systems and integration - Open systems application integration framework - Part 3: Reference description for IEC 61158 based control systems | - | - |
| TIA-485-A | 1998 | Electrical Characteristics of Generators and Receivers for Use in Balanced Digital Multipoint Systems | - | - |

# IEC 61784-1-3

Edition 1.0 2023-03

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

## Industrial networks – Profiles – Part 1-3: Fieldbus profiles – Communication Profile Family 3

## Réseaux industriels – Profils – Partie 1-3: Profils de bus de terrain – Famille de profils de communication 3

IEC 61784-1-3:2023-03(en-fr)

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IEC 61784-1-3

Edition 1.0 2023-03

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

## Industrial networks – Profiles – Part 1-3: Fieldbus profiles – Communication Profile Family 3

## Réseaux industriels – Profils – Partie 1-3: Profils de bus de terrain – Famille de profils de communication 3

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

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# CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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# INDUSTRIAL NETWORKS – PROFILES –

## Part 1-3: Fieldbus profiles – Communication Profile Family 3

## FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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Attention is drawn to the fact that the use of some of the associated protocol types is restricted by their intellectual-property-right holders. In all cases, the commitment to limited release of intellectual-property-rights made by the holders of those rights permits a layer protocol type to be used with other layer protocols of the same type, or in other type combinations explicitly authorized by their respective intellectual property right holders.

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

IEC 61784-1-3 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.

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. The main document types developed by IEC are described in greater detail at 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 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[1]. 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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[1] 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 1-3: Fieldbus profiles – Communication Profile Family 3

## 1 Scope

This part of IEC 61784-1 defines Communication Profile Family 3 (CPF 3). CPF 3 specifies a set of protocol specific communication profiles (CPs) based on the IEC 61158 series (Type 3 and Type 10) and other standards, to be used in the design of devices involved in communications in factory manufacturing and process control.

NOTE 1 All CPs are based on standards or draft standards or International Standards published by the IEC or on standards or International Standards established by other standards bodies or open standards processes.

NOTE 2 Some CPs of CPF 3 are specified in IEC 61784-2-3.

Each CP selects an appropriate consistent and compatible subset of services and protocols from the relevant set that is defined and modelled in the IEC 61158 series. For the selected subset of services and protocols, the profile also describes any possible or necessary constraints in parameter values.

## 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 60079-11, *Explosive atmospheres – Part 11: Equipment protection by intrinsic safety "i"*

IEC 60079-25, *Explosive atmospheres – Part 25: Intrinsically safe electrical systems*

IEC 61010 (all parts), *Safety requirements for electrical equipment for measurement, control and laboratory use*

IEC 61131-2, *Industrial-process measurement and control − Programmable controllers – Part 2: Equipment requirements and tests*

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

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

IEC 61158-3-3:2014, *Industrial communication networks – Fieldbus specifications – Part 3-3: Data-link layer service definition – Type 3 elements*

IEC 61158-4-3:2019, *Industrial communication networks – Fieldbus specifications – Part 4-3: Data-link layer protocol specification – Type 3 elements*

IEC 61158-5-3:2014, *Industrial communication networks – Fieldbus specifications – Part 5-3: Application layer service definition – Type 3 elements*

IEC 61158-6-3:2019, *Industrial communication networks – Fieldbus specifications – Part 6-3: Application layer protocol specification – Type 3 elements*

IEC 61784-1-0:2023, *Industrial networks – Profiles – Part 1-0: Fieldbus profiles – General concepts and terminology*

IEC 61784-2-3:2023, *Industrial networks – Profiles – Part 2-3: Additional real-time fieldbus profiles based on ISO/IEC/IEEE 8802-3 – CPF 3*

ISO 15745-3:2003, *Industrial automation systems and integration – Open systems application integration framework – Part 3: Reference description for IEC 61158-based control systems*

TIA-485-A:1998, *Electrical Characteristics of Generators and Receivers for Use in Balanced Digital Multipoint Systems*