

## SLOVENSKI STANDARD SIST EN 61784-5-14:2014

01-april-2014

Nadomešča:

SIST EN 61784-5-14:2012

Industrijska komunikacijska omrežja - Profili - 5-14. del: Inštalacija procesnih vodil - Inštalacijski profili za CPF 14 (IEC 61784-5-14:2013)

Industrial communication networks - Profiles -- Part 5-14: Installation of fieldbuses - Installation profiles for CPF 14

Industrielle Kommunikationsnetze - Profile A Teil 5-14 Feldbusinstallation - Installationsprofile für die Kommunikationsprofilfamilie 14 (Standards Iteh al)

Réseaux de communication industriels: Rrofils-5- Partie 5-14: Installation des bus de terrain - Profils d'installation pour Profils d'astandards/sist/d139876c-8906-4de5-a78a-e383cece4d98/sist-en-61784-5-14-2014

Ta slovenski standard je istoveten z: EN 61784-5-14:2013

ICS:

25.040.40 Merjenje in krmiljenje Industrial process

industrijskih postopkov measurement and control

35.100.40 Transportni sloj Transport layer

SIST EN 61784-5-14:2014 en,fr,de

SIST EN 61784-5-14:2014

# iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 61784-5-14:2014 https://standards.iteh.ai/catalog/standards/sist/d139876c-8906-4de5-a78a-e383cece4d98/sist-en-61784-5-14-2014

## **EUROPEAN STANDARD**

## EN 61784-5-14

## NORME EUROPÉENNE EUROPÄISCHE NORM

December 2013

ICS 25.040.40; 35.100.40

Supersedes EN 61784-5-14:2012

English version

Industrial communication networks Profiles Part 5-14: Installation of fieldbuses Installation profiles for CPF 14
(IEC 61784-5-14:2013)

Réseaux de communication industriels -Profils -Partie 5-14: Installation des bus de terrain -Profils d'installation pour CPF 14 (CEI 61784-5-14:2013)

Industrielle Kommunikationsnetze - Profile - Teil 5-14: Feldbusinstallation - Installationsprofile für die Kommunikationsprofilfamilie 14

## iTeh STANDARD PKE 61784-5-14:2013) (standards.iteh.ai)

#### SIST EN 61784-5-14:2014

This European Standard was approved by CENELEC on 2013 10-18. 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## **CENELEC**

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B - 1000 Brussels

### **Foreword**

The text of document 65C/738/FDIS, future edition 2 of IEC 61784-5-14, 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 61784-5-14:2013.

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
- latest date by which the national standards conflicting with the document have to be withdrawn

This document supersedes EN 61784-5-14:2012.

IEC 61784-5-14:2013 includes the following significant technical changes with respect to EN 61784-5-14:2012:

- requirements for CP 14/3 have been added;
- recommendations for the applications about the linear/ring topology networks have been added;
- Table A.2 and Table A.6 have been updated.

iTeh STANDARD PREVIEW

This standard is to be used in conjunction with EN 61918:2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights. https://standards.iteh.ai/catalog/standards/sist/d139876c-8906-4de5-a78a-

e383cece4d98/sist-en-61784-5-14-2014

### **Endorsement notice**

The text of the International Standard IEC 61784-5-14:2013 was approved by CENELEC as a European Standard without any modification.

## Annex ZA (normative)

# Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

## Annex ZA of EN 61918:2013 applies, except as follows:

Publication Year Title EN/HD Year

### Addition to Annex ZA of EN 61918:2013:

IEC 61918 2013 Industrial communication networks - EN 61918 2013

Installation of communication networks in

industrial premises

# iTeh STANDARD PREVIEW (standards.iteh.ai)

<u>SIST EN 61784-5-14:2014</u> https://standards.iteh.ai/catalog/standards/sist/d139876c-8906-4de5-a78a-e383cece4d98/sist-en-61784-5-14-2014 SIST EN 61784-5-14:2014

# iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 61784-5-14:2014 https://standards.iteh.ai/catalog/standards/sist/d139876c-8906-4de5-a78a-e383cece4d98/sist-en-61784-5-14-2014



## IEC 61784-5-14

Edition 2.0 2013-09

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



Industrial communication networks AProfiles -REVIEW
Part 5-14: Installation of fieldbuses - Installation profiles for CPF 14

Réseaux de communication industriels 4 Profils –
Partie 5-14: Installation des buside terrain profils d'installation pour CPF 14

e383cece4d98/sist-en-61784-5-14-2014

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE
CODE PRIX

V

ICS 25.040.40; 35.100.40

ISBN 978-2-8322-1070-3

Warning! Make sure that you obtained this publication from an authorized distributor.

Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.

## CONTENTS

FOI	REWORD	4
INT	RODUCTION	6
1	Scope	7
2	Normative references	7
3	Terms, definitions and abbreviated terms	7
4	CPF 14: Overview of installation profiles	7
5	Installation profile conventions	7
6	Conformance to installation profiles	8
Anr	nex A (Normative) CP 14/1, 14/2 and 14/3 (EPA) specific installation profile	9
A.1	Installation profile scope	9
A.2	Normative references	9
A.3	Installation profile terms, definitions, and abbreviated terms	9
	A.3.1 Terms and definitions	9
	A.3.2 Abbreviated terms	9
	A.3.3 Conventions for installation profiles	
A.4	Installation planning A.4.1 General iTeh STANDARD PREVIEW	9
	A.4.2 Planning requirements standards.iteh.ai) A.4.3 Network capabilities	9
	A.4.4 Selection and use of cabling components  A.4.5 Cabling planning documentation standards/sist/d139876c-8906-4de5-878a	۱۵ ۲۵
	A.4.6 Verification of cabling planning specification 5-14-2014	
A.5	Installation implementation	
	A.5.1 General requirements	
	A.5.2 Cable installation	
	A.5.3 Connector installation	25
	A.5.4 Terminator installation	
	A.5.5 Device installation	
	A.5.6 Coding and labelling	
	A.5.7 Earthing and bonding of equipment and devices and shield cabling	
Δ 6	A.5.8 As-implemented cabling documentation  Installation verification and installation acceptance test	
Λ.0	A.6.1 General	
	A.6.2 Installation verification	
	A.6.3 Installation acceptance test	
A.7	Installation administration	
A.8	Installation maintenance and installation troubleshooting	32
Figi	ure 1 – Standards relationships	6
Fig	ure A.1 – Example of EPA explosion-proof system	10
Fig	ure A.2 – Earth of zener safety barrier	11
Fig	ure A.3 – Earth of isolated safety barrier	11
Figi	ure A.4 – Three stars coupled to a ring topology	12
Figi	ure A.5 – Five daisy chain lines coupled to a ring topology	12

Figure A.6 – Five sub-rings coupled to a ring topology	13
Figure A.7 – Example of power with Ethernet	15
Figure A.8 – Example of power supply over 0,2 A	16
Figure A.9 – Example of power with Ethernet in linear/ring topology network	16
Figure A.10 – Examples of earthing method for the linear/ring topologies network	22
Figure A.11 – Pin assignment of sub-D connector	25
Figure A.12 – Example of a 4-pin open style connector	27
Figure A.13 – Example of a 6-pin open style connector	28
Figure A.14 – Example of an 8-pin open style connector	29
Table A.1 – Network characteristics for balanced cabling based on Ethernet	14
Table A.2 – Network characteristics for optical fibre cabling	14
Table A.3 – Information relevant to copper cable	16
Table A.4 – Information relevant to copper cable: fixed cables	17
Table A.5 – Information relevant to copper cable: cords	17
Table A.6 – Information relevant to optical fibre cables	18
Table A.7 – Connectors for balanced cabling CPs based on Ethernet	19
Table A.8 – Optical fibre connecting hardware	19
Table A.9 - Relationship between FOC and fibre type (CP 14/1, CP 14/2 and CP 14/3)	20
Table A.10 – Specific connectors for balanced cabling based on Ethernet	20
Table A.11 – Requirements of sub-D and open style connector	
Table A.12 – Parameters for balanced cables 1784.5-14:2014.	23
Table A.13 – Parameters for silica optical fibre cables e383ccce4d98/sist-en-61/84-5-14-2014	24
Table A.14 – Parameters for POF optical fibre cables	24
Table A.15 – Parameters for hard cladded silica optical fibre cables	24
Table A.16 – Signal lines assignment of sub-D connector	26
Table A.17 – Signal lines assignment of sub-D connector for 1 000 Base Ethernet	26
Table A.18 – Signal lines assignment for a 4-pin open style connector	27
Table A.19 – Signal lines assignment for a 6-pin open style connector	28
Table A.20 – Signal lines assignment for an 8-pin open style connector(10/100 Mbps)	29
Table A 21 - Signal lines assignment for an 8-nin open style connector(1 000 Mbit/s)	30

### INTERNATIONAL ELECTROTECHNICAL COMMISSION

## INDUSTRIAL COMMUNICATION NETWORKS – PROFILES –

# Part 5-14: Installation of fieldbuses – Installation profiles for CPF 14

#### **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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their snational and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.

  e383cccc4d98/sist-en-61784-5-14-2014
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61784-5-14 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation.

This second edition cancels and replaces the first edition issued in 2010. It constitutes a technical revision.

The main technical changes with regard to the previous edition are as follows:

- requirements for CP 14/3 have been added,
- recommendations for the applications about the linear/ring topology networks have been added,
- Table A.2 and Table A.6 have been updated.

This standard is to be used in conjunction with IEC 61918:2013.

61784-5-14 © IEC:2013

**-5-**

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

FDIS	Report on voting
65C/738/FDIS	65C/743/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of IEC 61784-5 series, under the general title *Industrial communication* networks – *Profiles* – *Installation of fieldbuses*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

## iTeh STANDARD PREVIEW

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer. https://standards.itch.ai/catalog/standards/sist/d139876c-8906-4de5-a78a-

e383cece4d98/sist-en-61784-5-14-2014

### INTRODUCTION

This International Standard is one of a series produced to facilitate the use of communication networks in industrial control systems.

IEC 61918:2013 provides the common requirements for the installation of communication networks in industrial control systems. This installation profile standard provides the installation profiles of the communication profiles (CP) of a specific communication profile family (CPF) by stating which requirements of IEC 61918 fully apply and, where necessary, by supplementing, modifying, or replacing the other requirements (see Figure 1).

For general background on fieldbuses, their profiles, and relationship between the installation profiles specified in this standard, see IEC 61158-1.

Each CP installation profile is specified in a separate annex of this standard. Each annex is structured exactly as the reference standard IEC 61918 for the benefit of the persons representing the roles in the fieldbus installation process as defined in IEC 61918 (planner, installer, verification personnel, validation personnel, maintenance personnel, administration personnel). By reading the installation profile in conjunction with IEC 61918, these persons immediately know which requirements are common for the installation of all CPs and which are modified or replaced. The conventions used to draft this standard are defined in Clause 5.

The provision of the installation profiles in one standard for each CPF (for example IEC 61784-5-14 for CPF 14), allows readers to work with standards of a convenient size.

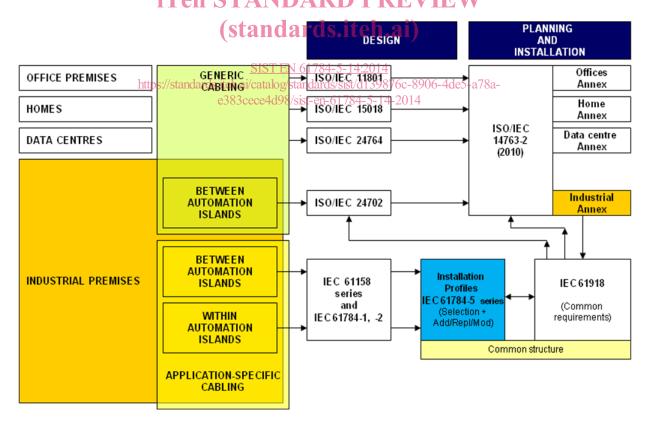


Figure 1 – Standards relationships