# STN

### Priemyselné komunikačné siete Profily Časť 5-20: Inštalácia prevádzkových zberníc Inštalačné profily pre rad komunikačných profilov CPF 20

STN EN IEC 61784-5-20

18 4020

Industrial communication networks - Profiles - Part 5-20: Installation of fieldbuses - Installation profiles for CPF 20

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. 04/19

Obsahuje: EN IEC 61784-5-20:2018, IEC 61784-5-20:2018

### EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

EN IEC 61784-5-20

December 2018

ICS 25.040.40; 35.100.40

#### **English Version**

Industrial communication networks - Profiles - Part 5-20: Installation of fieldbuses - Installation profiles for CPF 20 (IEC 61784-5-20:2018)

Réseaux de communication industriels - Profils - Partie 5-20: Installation des bus de terrain - Profils d'installation pour CPF 20 (IEC 61784-5-20:2018) Industrielle Kommunikationsnetze - Profile - Teil 5-20: Feldbusinstallation - Installationsprofile für die Kommunikationsprofilfamilie 20 (IEC 61784-5-20:2018)

This European Standard was approved by CENELEC on 2018-10-04. 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

#### EN IEC 61784-5-20:2018 (E)

### **European foreword**

The text of document 65C/924/FDIS, future edition 1 of IEC 61784-5-20, 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 61784-5-20:2018.

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

  (dow) 2021-10-04

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.

#### **Endorsement notice**

The text of the International Standard IEC 61784-5-20:2018 was approved by CENELEC as a European Standard without any modification.

EN IEC 61784-5-20:2018 (E)

### **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.cenelec.eu.

PublicationYearTitleEN/HDYearIEC 619182018Industrial communication networks - Installation of EN IEC 619182018communication networks in industrial premises

The normative references of EN IEC 61918:2018, Clause 2, apply.

NOTE For profile specific normative references, see Clauses A.2 and B.2.



IEC 61784-5-20

Edition 1.0 2018-08

# INTERNATIONAL STANDARD



Industrial communication networks – Profiles –
Part 5-20: Installation of fieldbuses – Installation profiles for CPF 20





# THIS PUBLICATION IS COPYRIGHT PROTECTED Copyright © 2018 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Central Office 3, rue de Varembé CH-1211 Geneva 20 Switzerland Tel.: +41 22 919 02 11 info@iec.ch

www.iec.ch

#### About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

#### About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

#### IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

#### IEC publications search - webstore. iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

### IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

#### Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing 21 000 terms and definitions in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

#### IEC Glossary - std.iec.ch/glossary

67 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

#### IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.



IEC 61784-5-20

Edition 1.0 2018-08

# INTERNATIONAL STANDARD



Industrial communication networks – Profiles –
Part 5-20: Installation of fieldbuses – Installation profiles for CPF 20

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 25.040.40; 35.100.40

ISBN 978-2-8322-6011-1

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

### - 2 - IEC 61784-5-20:2018 © IEC 2018

### CONTENTS

FOREWO	)RD	4
INTRODU	JCTION	6
1 Scop	pe	7
2 Norn	native references	7
3 Term	ns, definitions, symbols and abbreviations	7
	20: Overview of installation profiles	
	allation profile conventions	
	formance to installation profiles	
Annex A	(normative) CP 20/1 (ADS-net/μΣΝΕΤWORK-1000) specific installation	
A.1	Installation profile scope	
A.2	Normative references	
A.3	Installation profile terms, definitions, and abbreviated terms	
A.3.	·	
A.3.2	2 Abbreviated terms	10
A.3.3	Conventions for installation profiles	10
A.4	Installation planning	11
A.4.	1 General	11
A.4.2		
A.4.3	- ·	
A.4.4	5 1	
A.4.5		
A.4.6	31 31	
A.5	Installation implementation	
A.5.	•	
A.5.2		
A.5.4 A.5.4		
A.5.4 A.5.5		
A.5.6		
A.5.7		
A.5.8		
A.6	Installation verification and installation acceptance test	
A.6.	·	
A.6.2		
A.6.3		
A.7	Installation administration	
A.8	Installation maintenance and installation troubleshooting	25
Annex B	(normative) CP 20/2 (ADS-net/NX) specific installation profile	26
B.1	Installation profile scope	26
B.2	Normative references	26
B.3	Installation profile terms, definitions, and abbreviated terms	26
B.3.	1 Terms and definitions	26
B.3.2	2 Abbreviated terms	26
B.3.3	'	
B.4	Installation planning	27

### IEC 61784-5-20:2018 © IEC 2018

- 3 -

B.4.1	General	27
B.4.2	Planning requirements	27
B.4.3	Network capabilities	27
B.4.4	Selection and use of cabling components	29
B.4.5	Cabling planning documentation	36
B.4.6	Verification of cabling planning specification	36
B.5 Ins	tallation implementation	36
B.5.1	General requirements	36
B.5.2	Cable installation	
B.5.3	Connector installation	
B.5.4	Terminator installation	
B.5.5	Device installation	
B.5.6	Coding and labelling	
B.5.7	Earthing and bonding of equipment and devices and shield cabling	
B.5.8	As-implemented cabling documentation	
	tallation verification and installation acceptance test	
B.6.1	General	
B.6.2	Installation verification	
B.6.3	Installation acceptance test	
	stallation administration	
	stallation maintenance and installation troubleshooting	
Bibliography.		42
Figure 1 – St	andards relationships	6
Table A.1 – N	Network characteristics for balanced cabling based on Ethernet	12
Table A.2 – N	Network characteristics for optical fibre cabling	13
Table A.3 – I	nformation relevant to copper cable: fixed cables	14
Table A.4 – I	nformation relevant to copper cable: cords	14
	nformation relevant to optical fibre cables	
	Connectors for balanced cabling CPs based on Ethernet	
	C	
	Optical fibre connecting hardware	
	Relationship between FOC and fibre types (CP 20/1)	
	Parameters for balanced cables	
Table A.10 –	Parameters for silica optical fibre cables	21
Table B.1 – N	Network characteristics for balanced cabling based on Ethernet	28
Table B.2 – N	Network characteristics for optical fibre cabling	29
Table B.3 – I	nformation relevant to copper cable: fixed cables	30
	nformation relevant to copper cable: cords	
	nformation relevant to optical fibre cables	
	Connectors for balanced cabling CPs based on Ethernet	
	Optical fibre connecting hardware	
	Relationship between FOC and fibre types (CP 20/2)	
	Parameters for balanced cables	
Table B.10 -	Parameters for silica optical fibre cables	37

- 4 - IFC 61

IEC 61784-5-20:2018 © IEC 2018

#### INTERNATIONAL ELECTROTECHNICAL COMMISSION

INDUSTRIAL COMMUNICATION NETWORKS – PROFILES –

# Part 5-20: Installation of fieldbuses – Installation profiles for CPF 20

#### **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 national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 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 61784-5-20 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation.

This standard is to be used in conjunction with IEC 61918:2018.

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

FDIS	Report on voting
65C/924/FDIS	65C/925/RVD

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

IEC 61784-5-20:2018 © IEC 2018

- 5 -

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

A list of all parts of the IEC 61784-5 series, published 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 document 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 document. At this date, the document will be

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

A bilingual version of this publication may be issued at a later date.

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.

- 6 - IEC 61784-5-20:2018 © IEC 2018

#### INTRODUCTION

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

IEC 61918:2018 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 document, see IEC 61158-1. Each CP installation profile is specified in a separate annex of this document. 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 document are defined in Clause 5. The provision of the installation profiles in one standard for each CPF (for example IEC 61784-5-20 for CPF 20) allows readers to work with standards of a convenient size.

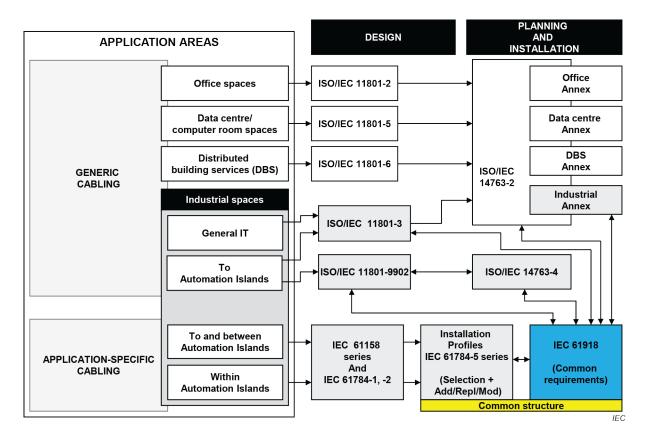


Figure 1 - Standards relationships

IEC 61784-5-20:2018 © IEC 2018

- 7 -

## INDUSTRIAL COMMUNICATION NETWORKS – PROFILES –

# Part 5-20: Installation of fieldbuses – Installation profiles for CPF 20

#### 1 Scope

This part of IEC 61784 specifies the installation profiles for CPF 20 (ADS-net<sup>1</sup>).

The installation profiles are specified in the annexes. These annexes are read in conjunction with IEC 61918:2018.

#### 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.

IEC 61918:2018, Industrial communication networks – Installation of communication networks in industrial premises

The normative references of IEC 61918:2018, Clause 2, apply.

NOTE For profile specific normative references, see Clauses A.2 and B.2.

koniec náhľadu – text ďalej pokračuje v platenej verzii STN

<sup>1</sup>  $\Delta$ S-net, ADS-net/ $\mu\Sigma$ NETWORK-1000 and ADS-net/NX are used to describe this document.