

Industrial communication networks - Profiles - Part 5-8:
Installation of fieldbuses - Installation profiles for CPF 8

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 61784-5-8:2018 sisaldab Euroopa standardi EN IEC 61784-5-8:2018 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 61784-5-8:2018 consists of the English text of the European standard EN IEC 61784-5-8:2018.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 21.12.2018.	Date of Availability of the European standard is 21.12.2018.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 25.040.40, 35.100.40

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:
Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

**Industrial communication networks - Profiles - Part 5-8:
Installation of fieldbuses - Installation profiles for CPF 8
(IEC 61784-5-8:2018)**

Réseaux de communication industriels - Profils - Partie 5-8:
Installation des bus de terrain - Profils d'installation pour
CPF 8
(IEC 61784-5-8:2018)

Industrielle Kommunikationsnetze - Profile - Teil 5-8:
Feldbusinstallation - Installationsprofile für die
Kommunikationsprofilfamilie 8
(IEC 61784-5-8:2018)

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

European foreword

The text of document 65C/924/FDIS, future edition 2 of IEC 61784-5-8, 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 61784-5-8:2018.

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 (dop) 2019-07-04
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2021-10-04

This document supersedes EN 61784-5-8:2013.

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 61784-5-8:2018 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 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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61918	2018	Industrial communication networks - Installation of communication networks in industrial premises	EN IEC 61918	2018

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

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

CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references	9
3 Terms, definitions and abbreviated terms	9
4 CPF 8: Overview of installation profiles	9
5 Installation profile conventions	10
6 Conformance to installation profiles.....	10
Annex A (normative) CP 8/1 and CP 8/2 (CC-Link/V1 and CC-Link/V2) specific installation profile	12
A.1 Installation profile scope	12
A.2 Normative references.....	12
A.3 Installation profile terms, definitions, and abbreviated terms	12
A.3.1 Terms and definitions	12
A.3.2 Abbreviated terms	12
A.3.3 Conventions for installation profiles	12
A.4 Installation planning.....	12
A.4.1 General	12
A.4.2 Planning requirements.....	13
A.4.3 Network capabilities.....	13
A.4.4 Selection and use of cabling components	15
A.4.5 Cabling planning documentation	20
A.4.6 Verification of cabling planning specification.....	20
A.5 Installation implementation	20
A.5.1 General requirements	20
A.5.2 Cable installation.....	21
A.5.3 Connector installation	22
A.5.4 Terminator installation	22
A.5.5 Device installation	23
A.5.6 Coding and labelling	23
A.5.7 Earthing and bonding of equipment and devices and shield cabling	23
A.5.8 As-implemented cabling documentation.....	24
A.6 Installation verification and installation acceptance test	24
A.6.1 General	24
A.6.2 Installation verification	24
A.6.3 Installation acceptance test	25
A.7 Installation administration	25
A.8 Installation maintenance and installation troubleshooting	25
Annex B (normative) CP 8/3 (CC-Link/LT) 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 Abbreviated terms	26
B.3.3 Conventions for installation profiles	26
B.4 Installation planning.....	26

B.4.1	General	26
B.4.2	Planning requirements	27
B.4.3	Network capabilities	27
B.4.4	Selection and use of cabling components	30
B.4.5	Cabling planning documentation	37
B.4.6	Verification of cabling planning specification	37
B.5	Installation implementation	37
B.5.1	General requirements	37
B.5.2	Cable installation	37
B.5.3	Connector installation	38
B.5.4	Terminator installation	39
B.5.5	Device installation	39
B.5.6	Coding and labelling	39
B.5.7	Earthing and bonding of equipment and devices and shield cabling	39
B.5.8	As-implemented cabling documentation	40
B.6	Installation verification and installation acceptance test	40
B.6.1	General	40
B.6.2	Installation verification	40
B.6.3	Installation acceptance test	41
B.7	Installation administration	41
B.8	Installation maintenance and installation troubleshooting	41
Annex C (normative) CP 8/4 (CC-Link IE Controller Network) specific installation profile		42
C.1	Installation profile scope	42
C.2	Normative references	42
C.3	Installation profile terms, definitions, and abbreviated terms	42
C.3.1	Terms and definitions	42
C.3.2	Abbreviated terms	42
C.3.3	Conventions for installation profiles	42
C.4	Installation planning	42
C.4.1	General	42
C.4.2	Planning requirements	42
C.4.3	Network capabilities	43
C.4.4	Selection and use of cabling components	45
C.4.5	Cabling planning documentation	50
C.4.6	Verification of cabling planning specification	51
C.5	Installation implementation	51
C.5.1	General requirements	51
C.5.2	Cable installation	51
C.5.3	Connector installation	52
C.5.4	Terminator installation	53
C.5.5	Device installation	53
C.5.6	Coding and labelling	53
C.5.7	Earthing and bonding of equipment and devices and shield cabling	53
C.5.8	As-implemented cabling documentation	54
C.6	Installation verification and installation acceptance test	54
C.6.1	General	54
C.6.2	Installation verification	54
C.6.3	Installation acceptance test	55

C.7	Installation administration	55
C.8	Installation maintenance and installation troubleshooting	56
Annex D	(normative) CP 8/5 (CC-Link IE Field Network) specific installation profile	57
D.1	Installation profile scope	57
D.2	Normative references	57
D.3	Installation profile terms, definitions, and abbreviated terms	57
D.3.1	Terms and definitions	57
D.3.2	Abbreviated terms	57
D.3.3	Conventions for installation profiles	57
D.4	Installation planning	57
D.4.1	General	57
D.4.2	Planning requirements	57
D.4.3	Network capabilities	58
D.4.4	Selection and use of cabling components	59
D.4.5	Cabling planning documentation	64
D.4.6	Verification of cabling planning specification	65
D.5	Installation implementation	65
D.5.1	General requirements	65
D.5.2	Cable installation	65
D.5.3	Connector installation	66
D.5.4	Terminator installation	66
D.5.5	Device installation	67
D.5.6	Coding and labelling	67
D.5.7	Earthing and bonding of equipment and devices and shield cabling	67
D.5.8	As-implemented cabling documentation	68
D.6	Installation verification and installation acceptance test	68
D.6.1	General	68
D.6.2	Installation verification	68
D.6.3	Installation acceptance test	69
D.7	Installation administration	69
D.8	Installation maintenance and installation troubleshooting	69
Bibliography	70
Figure 1	– Standards relationships	8
Figure A.1	– Pass-through connector configuration	14
Figure A.2	– Bus t-branch topology	14
Figure A.3	– Wiring	17
Figure B.1	– Powered network topology	28
Figure B.2	– Bus t-branch topology	28
Figure B.3	– Flat cable cross section – with key	31
Figure B.4	– Flat cable cross section – without key	31
Figure B.5	– Flat cable polarity marking	31
Figure B.6	– Wiring	32
Figure B.7	– Flat cable connector and terminal cover	33
Table A.1	– Basic network characteristics for balanced cabling not based on Ethernet	15
Table A.2	– Bus t-branch network characteristics	15

Table A.3 – Information relevant to copper cable: fixed cables	16
Table A.4 – Connectors for copper cabling CPs not based on Ethernet.....	17
Table A.5 – Parameters for balanced cables	21
Table A.6 – Cable conductor assignments	22
Table B.1 – Basic network characteristics for balanced cabling not based on Ethernet	29
Table B.2 – CP 8/3 additional topology length limits.....	29
Table B.3 – Information relevant to copper cable: cords.....	31
Table B.4 – Connectors for copper cabling CPs not based on Ethernet.....	34
Table B.5 – Parameters for balanced cables	37
Table B.6 – Flat cable conductor assignments	38
Table C.1 – Network characteristics for balanced cabling based on Ethernet	44
Table C.2 – Network characteristics for optical fibre cabling	44
Table C.3 – Information relevant to copper cable: fixed cables.....	45
Table C.4 – Information relevant to optical fibre cables	46
Table C.5 – Connectors for balanced cabling CPs based on Ethernet	46
Table C.6 – Optical fibre connecting hardware	47
Table C.7 – Relationship between FOC and fibre types (CP 8/4)	47
Table C.8 – Parameters for balanced cables.....	51
Table C.9 – Parameters for silica optical fibre cables.....	51
Table D.1 – Network characteristics for balanced cabling based on Ethernet	59
Table D.2 – Information relevant to copper cable: fixed cables.....	60
Table D.3 – Connectors for balanced cabling CPs based on Ethernet.....	61
Table D.4 – Parameters for balanced cables.....	65

INTERNATIONAL ELECTROTECHNICAL COMMISSION

INDUSTRIAL COMMUNICATION NETWORKS – PROFILES –

Part 5-8: Installation of fieldbuses – Installation profiles for CPF 8

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 61784-5-8 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 published in 2013. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) The reference to ISO/IEC 24702 has been replaced with reference to the new ISO/IEC 11801-3;
- b) Annex C has been extended to cover the balanced cabling based on Ethernet that is applicable to CP8/4. Table C.1, Table C.3, Table C.5 and Table C.8 are added;

- c) Annex D has been extended to cover the M12-8 X-coding connector use that is applicable to CP/8/5. Table D.3 is revised.

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.

This document 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 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.

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 61918:2018 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 61918:2018 for the benefit of the persons representing the roles in the fieldbus installation process as defined in IEC 61918:2018 (planner, installer, verification personnel, validation personnel, maintenance personnel, administration personnel). By reading the installation profile in conjunction with IEC 61918:2018, 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 61784-5-8 for CPF 8), allows readers to work with standards of a convenient size.

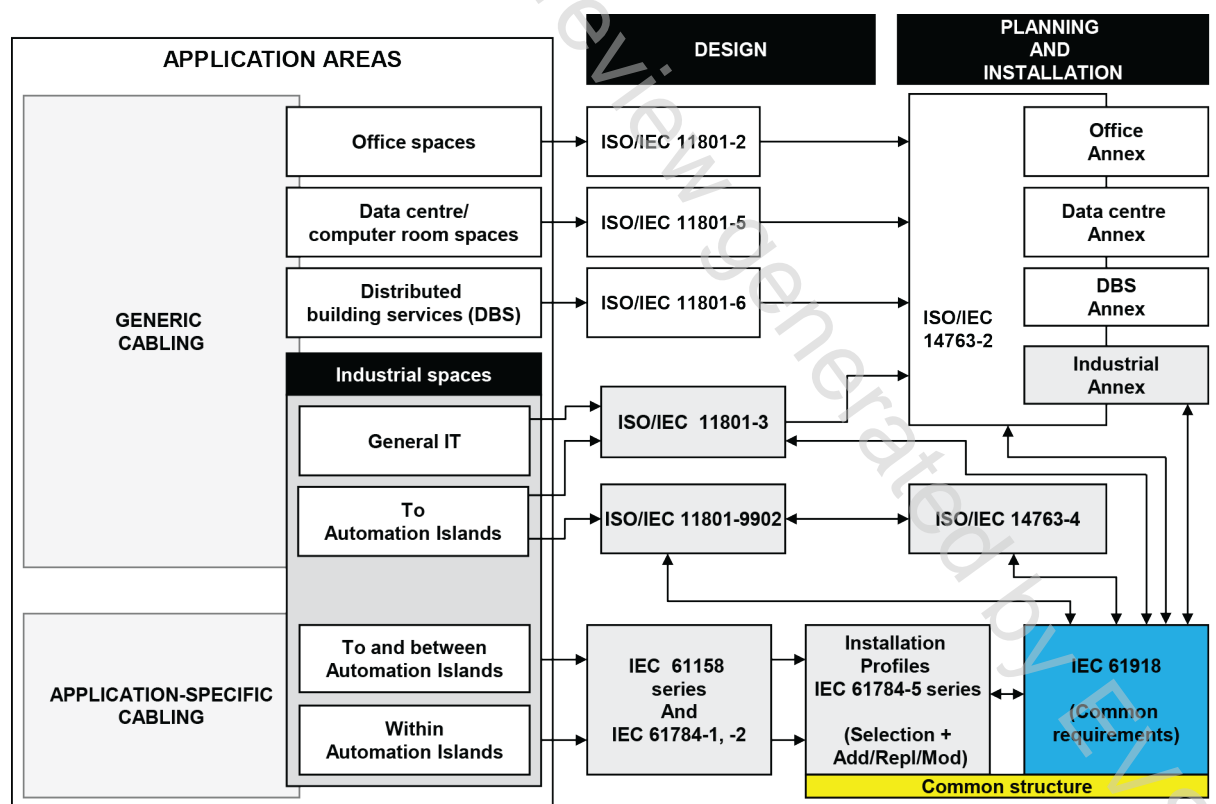


Figure 1 – Standards relationships