

© Copyright SEK. Reproduction in any form without permission is prohibited.

Industriell processtyrning – Profiler – Del 5-19: Installation av fältbussar – Installationsprofiler för CPF 1 (MECHATROLINK)

*Industrial communication networks –
Profiles –
Part 5-19: Installation of fieldbuses –
Installation profiles for CPF 19*

Som svensk standard gäller europastandarden EN 61784-5-19:2013. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61784-5-19:2013.

Nationellt förord

Europastandarden EN 61784-5-19:2013

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 61784-5-19, First edition, 2013 - Industrial communication networks - Profiles - Part 5-19: Installation of fieldbuses - Installation profiles for CPF 19**

utarbetad inom International Electrotechnical Commission, IEC.

Standarden ska användas tillsammans med SS-EN 61918, utgåva 2, 2014.

ICS 25.040.40; 35.100.40

Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

SEK är Sveriges röst i standardiseringssarbetet inom elområdet

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

Stora delar av arbetet sker internationellt

Utdriften av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringssarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringssverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtidens standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

SEK Svensk Elstandard

Box 1284
164 29 Kista
Tel 08-444 14 00
www.elstandard.se

English version

**Industrial communication networks -
Profiles -
Part 5-19: Installation of fieldbuses -
Installation profiles for CPF 19
(IEC 61784-5-19:2013)**

Réseaux de communication industriels -
Profils -
Partie 5-19: Installation des bus de terrain
- Profils d'installation pour CPF 19
(CEI 61784-5-19:2013)

Industrielle Kommunikationsnetze -
Profile -
Teil 5-19: Feldbusinstallation -
Installationsprofile für die
Kommunikationsprofilfamilie 19
(IEC 61784-5-19:2013)

This European Standard was approved by CENELEC on 2013-10-14. 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 1 of IEC 61784-5-19, 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 61784-5-19:2013.

The following dates are fixed:

- latest date by which the document has to be (dop) 2014-07-14
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) 2016-10-14

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.

Endorsement notice

The text of the International Standard IEC 61784-5-19:2013 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:

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
--------------------	-------------	--------------	--------------	-------------

Addition to Annex ZA of EN 61918:2013:

IEC 61918	2013	Industrial communication networks - Installation of communication networks in industrial premises	EN 61918	2013
-----------	------	---	----------	------

CONTENTS

INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	8
3 Terms, definitions and abbreviated terms	8
4 CPF19: Overview of installation profiles	8
5 Installation profile conventions	8
6 Conformance to installation profiles.....	9
Annex A (normative) CP 19/1 (MECHATROLINK-II) specific installation profile	11
A.1 Installation profile scope.....	11
A.2 Normative references	11
A.3 Installation profile terms, definitions, and abbreviated terms.....	11
A.3.1 Terms and definitions	11
A.3.2 Abbreviated terms	11
A.3.3 Conventions for installation profiles	11
A.4 Installation planning	12
A.4.1 General	12
A.4.2 Planning requirements.....	12
A.4.3 Network capabilities	12
A.4.4 Selection and use of cabling components	14
A.4.5 Cabling planning documentation.....	21
A.4.6 Verification of cabling planning specification	21
A.5 Installation implementation	22
A.5.1 General requirements	22
A.5.2 Cable installation.....	22
A.5.3 Connector installation.....	23
A.5.4 Terminator installation.....	24
A.5.5 Device installation	24
A.5.6 Coding and labelling	24
A.5.7 Earthing and bonding of equipment and devices and shield cabling.....	24
A.5.8 As-implemented cabling documentation.....	25
A.6 Installation verification and installation acceptance test.....	25
A.6.1 General	25
A.6.2 Installation verification.....	25
A.6.3 Installation acceptance test	26
A.7 Installation administration.....	26
A.8 Installation maintenance and installation troubleshooting	27
Annex B (normative) CP 19/2 (MECHATROLINK-III) specific installation profile	29
B.1 Installation profile scope.....	29
B.2 Normative references	29
B.3 Installation profile terms, definitions, and abbreviated terms	29
B.3.1 Terms and definitions	29
B.3.2 Abbreviated terms	29
B.3.3 Conventions for installation profiles	29

B.4 Installation planning	29
B.4.1 General	29
B.4.2 Planning requirements.....	29
B.4.3 Network capabilities	30
B.4.4 Selection and use of cabling components	31
B.4.5 Cabling planning documentation.....	36
B.4.6 Verification of cabling planning specification	36
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	38
B.5.5 Device installation	38
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.....	39
B.6 Installation verification and installation acceptance test	39
B.6.1 General	39
B.6.2 Installation verification.....	39
B.6.3 Installation acceptance test	40
B.7 Installation administration.....	40
B.8 Installation maintenance and installation troubleshooting	40
Bibliography.....	41
 Figure 1 – Standards relationships.....	7
Figure A.1 – Topology of CP 19/1 network	13
Figure A.2 – Network expansion using repeater	13
Figure A.3 – Structure of cable	15
Figure A.4 – Dimensions of single port device connector	17
Figure A.5 – Dimensions of dual ports device connector	17
Figure A.6 – Dimensions of cable connector	18
Figure A.7 – Cable connector with inductors	18
Figure A.8 – Terminator connection in cable connector housing	19
Figure A.9 – Wiring example	23
Figure A.10 – Terminator installed in M-II cable connector	24
Figure A.11 – Division of network segment by changing terminator location.....	28
Figure B.1 – Dimensions of IMI device connector.....	33
Figure B.2 – Dimensions of IMI cable connector	34
 Table A.1 – Basic network characteristics for balanced cabling not based on Ethernet	13
Table A.2 – Number of devices and maximum segment length.....	14
Table A.3 – Information relevant to copper cable: fixed cables.....	15
Table A.4 – Additional cable specifications	15
Table A.5 – Connectors for copper cabling CPs not based on Ethernet.....	16
Table A.6 – Parameters for balanced cables	22
Table A.7 – Pin assignment and wire colour coding for CP 19/1 connector	24

Table A.8 – Typical problems in a network with balanced cabling	27
Table B.1 – Network characteristics for balanced cabling based on Ethernet	31
Table B.2 – Information relevant to copper cable: fixed cables.....	31
Table B.3 – Information relevant to copper cable: cords.....	32
Table B.4 – Connectors for balanced cabling CPs based on Ethernet	33
Table B.5 – Parameters for balanced cables	37
Table B.6 – Pin assignment and wire colour coding for CP 19/2 connector	38

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 61784-5-19 for CPF 19), allows readers to work with standards of a convenient size.

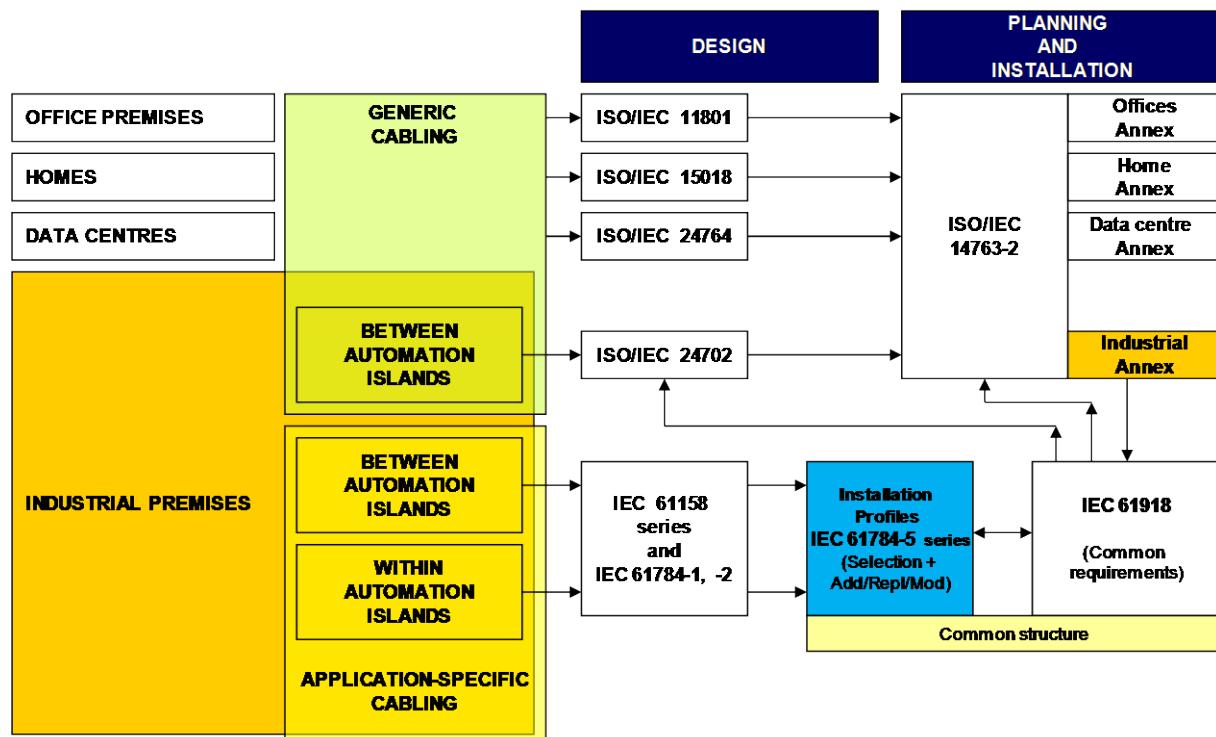


Figure 1 – Standards relationships

INDUSTRIAL COMMUNICATION NETWORKS – PROFILES –

Part 5-19: Installation of fieldbuses – Installation profiles for CPF 19

1 Scope

This part of IEC 61784 specifies the installation profiles for CPF 19 (MECHATROLINK™¹).

The installation profiles are specified in the annexes. These annexes are read in conjunction with IEC 61918:2013.

2 Normative references

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.

IEC 61918:2013, *Industrial communication networks – Installation of communication networks in industrial premises*

The normative references of IEC 61918:2013, Clause 2, apply. For profile specific normative references, see Clause A.2.

¹ MECHATROLINK™ is a trade name of YASKAWA ELECTRIC CORPORATION. This information is given for the convenience of users of this document and does not constitute an endorsement by IEC of the trade names holder or any of its products. Compliance to this profile does not require use of the trade names. Use of the trade name MECHATROLINK requires permission of the trade name holder.