



IEC 61784-5-6

Edition 1.0 2007-12

# INTERNATIONAL STANDARD

---

**Industrial communication networks – Profiles –  
Part 5-6: Installation of fieldbuses – Installation profiles for CPF 6**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

PRICE CODE

**X**

---

ICS 35.100.05 25.040.40

ISBN 2-8318-9404-2

## CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references.....	8
3 Terms, definitions and abbreviated terms.....	8
4 CPF 6: Overview of installation profiles.....	8
5 Installation profile conventions.....	8
6 Conformance to installation profiles.....	10
Annex A (Normative) CPF 6 Type 8 network 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.....	12
A.3.3 Conventions for installation profiles.....	12
A.4 Installation planning.....	13
A.4.1 Introduction.....	13
A.4.2 Planning requirements.....	13
A.4.3 Network capabilities.....	14
A.4.4 Selection and use of cabling components.....	19
A.4.5 Cabling planning documentation.....	26
A.4.6 Verification of cabling planning specification.....	26
A.5 Installation implementation.....	26
A.5.1 General requirements.....	26
A.5.2 Cable installation.....	26
A.5.3 Connector installation.....	28
A.5.4 Terminator installation.....	30
A.5.5 Device installation.....	30
A.5.6 Coding and labeling.....	30
A.5.7 Earthing and bonding of equipment and devices and shield cabling.....	30
A.5.8 As implemented cabling documentation.....	30
A.6 Installation verification and installation acceptance test.....	31
A.6.1 Introduction.....	31
A.6.2 Installation verification.....	31
A.6.3 Installation acceptance test.....	32
A.7 Installation administration.....	32
A.8 Installation maintenance and installation Troubleshooting.....	33
Annex B (Normative) CP 6/2 Ethernet network specific installation profile.....	34
B.1 Installation profile scope.....	34
B.2 Normative references.....	34
B.3 Installation profile terms, definitions, and abbreviated terms.....	34
B.3.1 Terms and definitions.....	34
B.3.2 Abbreviated terms.....	34
B.3.3 Conventions for installation profiles.....	34
B.4 Installation planning.....	35
B.4.1 Introduction.....	35

B.4.2	Planning requirements .....	35
B.4.3	Network capabilities .....	36
B.4.4	Selection and use of cabling components .....	39
B.4.5	Cabling planning documentation .....	45
B.4.6	Verification of cabling planning specification .....	45
B.5	Installation implementation .....	45
B.5.1	General requirements .....	45
B.5.2	Cable installation .....	45
B.5.3	Connector installation .....	47
B.5.4	Terminator installation .....	48
B.5.5	Device installation .....	48
B.5.6	Coding and labeling .....	48
B.5.7	Earthing and bonding of equipment and devices and shield cabling .....	49
B.5.8	As-implemented cabling documentation .....	49
B.6	Installation verification and installation acceptance test .....	49
B.6.1	Introduction .....	49
B.6.2	Installation verification .....	49
B.6.3	Installation acceptance test .....	49
B.7	Installation administration .....	49
B.8	Installation maintenance and installation Troubleshooting .....	49
	Bibliography .....	50
Table A.1	– Basic network characteristics for balanced cabling not based on Ethernet .....	17
Table A.2	– Network characteristics for optical fibre cabling .....	18
Table A.3	– Information relevant to balanced cable: fixed cables .....	19
Table A.4	– Information relevant to balanced cable: cords .....	20
Table A.5	– Remote bus fibre optic cord length .....	22
Table A.6	– Connectors for balanced cabling CPs not based on Ethernet .....	23
Table A.7	– Optical fibre connecting hardware .....	23
Table A.8	– Colour code for balanced cables used by Type 8 networks .....	24
Table A.9	– Parameters for balanced cables .....	27
Table A.10	– Parameters for silica optical fibre cables .....	27
Table A.11	– Parameters for POF optical fibre cables .....	27
Table A.12	– Parameters for hard cladded silica optical fibre cables .....	28
Table A.13	– Pin assignment of the terminal connector .....	30
Table B.1	– Network characteristics for balanced cabling based on Ethernet .....	37
Table B.2	– Network characteristics for optical fibre cabling .....	38
Table B.3	– Information relevant to balanced cable: fixed cables .....	39
Table B.4	– Information relevant to balanced cable: cords .....	40
Table B.5	– Information relevant to optical fibre cables .....	41
Table B.6	– Connectors for balanced cabling CPs based on Ethernet .....	42
Table B.7	– Optical fibre connecting hardware .....	42
Table B.8	– Dimensions of the sealed SC-RJ free connector .....	43
Table B.9	– Dimensions of the sealed SC-RJ fixed adaptor .....	44
Table B.10	– Typical parameters for copper cables .....	46

Table B.11 – Typical parameters for Silica fibre cables .....	46
Table B.12 – POF fibre cables.....	46
Table B.13 – Hard cladded silica fibre cables .....	47
Table B.14 – Connector pin assignment .....	48
Figure 1 – Standards relationships .....	7
Figure A.1 – Type 8 network structure example .....	15
Figure A.2 – Example of a Type 8 network configuration.....	16
Figure A.3 – Sub-D connector pin assignments.....	29
Figure A.4 – M23 circular connector pin assignments .....	29
Figure A.5 – M12 circular connector pin assignments .....	30
Figure A.6 – Terminal connector at the device .....	30
Figure B.1 – Sealed SC-RJ free connector .....	43
Figure B.2 – Sealed SC-RJ fixed adaptor.....	44
Figure B.3 – Terminal connector at the device .....	48
Figure B.4 – Pin numbering.....	48

Currently in preview, click buy full version

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## INDUSTRIAL COMMUNICATION NETWORKS – PROFILES

## Part 5-6: Installation of fieldbuses – Installation profiles for CPF 6

## 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 provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 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 61784-5-6 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 61918:2007.

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

FDIS	Report on voting
65C/471/FDIS	65C/482/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 the 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 maintenance result 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.

Currently in preview, click buy full version

## INTRODUCTION

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

IEC 61918:2007 (Ed. 1.0) 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/TR 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 CPFs 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 (e.g. IEC 61784-5-6 for CPF 6), allows readers to work with standards of a convenient size.

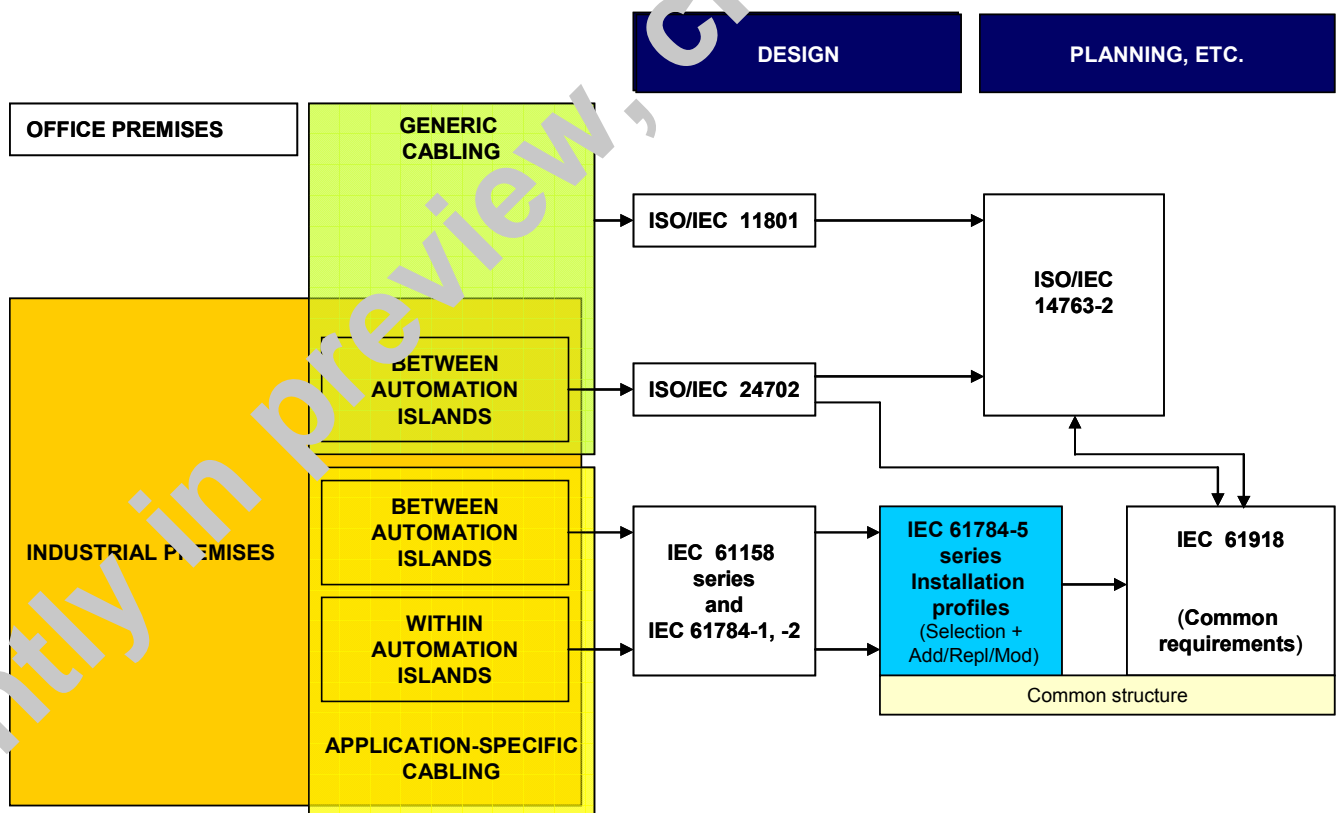


Figure 1 – Standards relationships

## INDUSTRIAL COMMUNICATION NETWORKS – PROFILES

### Part 5-6: Installation of fieldbuses – Installation profiles for CPF 6

#### 1 Scope

This part of IEC 61784 specifies the installation profiles for the media specified in CPF 6 (INTERBUS)<sup>1</sup>.

The installation profiles are specified in the annexes. These annexes are read in conjunction with IEC 61918:2007.

#### 2 Normative references

The following referenced documents are indispensable for the application 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 61918:2007, *Industrial communication networks – Installation of communication networks in industrial premises*

The normative references of IEC 61918:2007, Clause 2, apply. For profile specific normative references see A.2, and B.2.

---

<sup>1</sup> INTERBUS is a trade name of INTERBUS Club, an independent organisation of users and vendors of INTERBUS products. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by IEC of the trademark holder or any of its products. Compliance to this profile does not require use of the trade name INTERBUS. Use of the trade name INTERBUS requires permission of the trade name holder.