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Edition 1.0 2007-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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Industrial communication networks – Profiles – Part 5-11: Installation of fieldbuses – Installation profiles for CPF 11

Réseaux de communication industriels – Profils – Partie 5-11: Installation des bus de terrain – Profils d'installation pour CPF 11

IEC 61784-5-11:2007-12(en-fr)

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CONTENTS

FOREWORD 4
INTRODUCTION 6
1 Scope 7
2 Normative references 7
3 Terms, definitions and abbreviated terms 7
4 CPF 11: Overview of installation profiles 7
5 Installation profile conventions 7
6 Conformance to installation profiles 8
Annex A (normative) CP 11/1 (TCnet) 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.4 Installation planning 9
A.4.1 Introduction 9
A.4.2 Planning requirements 9
A.4.3 Network capabilities 10
A.4.4 Selection and use of cabling components 12
A.4.5 Cabling planning documentation 16
A.4.6 Verification of cabling planning specification 16
A.5 Installation implementation 16
A.5.1 General requirements 16
A.5.2 Cable installation 16
A.5.3 Connector installation 17
A.5.4 Terminator installation 17
A.5.5 Device installation 17
A.5.6 Coding and labelling 17
A.5.7 Earthing and bonding of equipment and devices and shield cabling 17
A.5.8 As-implemented cabling documentation 18
A.6 Installation verification and installation acceptance test 18
A.6.1 Introduction 18
A.6.2 Installation verification 18
A.6.3 Installation acceptance test 19
A.7 Installation administration 19
A.8 Installation maintenance and installation troubleshooting 19

Bibliography 20

Figure 1 – Standards relationships 6

Table A. 1 – Network characteristics for balanced cabling based on Ethernet 11
Table A. 2 – Network characteristics for optical fibre cabling 11
Table A. 3 – Information relevant to copper cable: fixed cables 12
Table A. 4 – Information relevant to copper cable: cords 12
Table A. 5 – Information relevant to optical fibre cables 13
Table A. 6 – Connectors for balanced cabling CPs based on Ethernet 14

Withdrawn

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Table A. 7 – Optical fibre connecting hardware 14
Table A. 8 – Recommended minimum distances specific for CP 11/1 16

withdrawn

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INDUSTRIAL COMMUNICATION NETWORKS – PROFILES

Part 5-11: Installation of fieldbuses – Installation profiles for CPF 11

FOREWORD

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International Standard IEC 61784-5-11 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.

This bilingual version (2014-12) corresponds to the English version, published in 2007-12.

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.

The French version of this standard has not been voted upon.

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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
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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 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 (e.g. IEC 61784-5-11 for CPF 11), allows readers to work with standards of a convenient size.

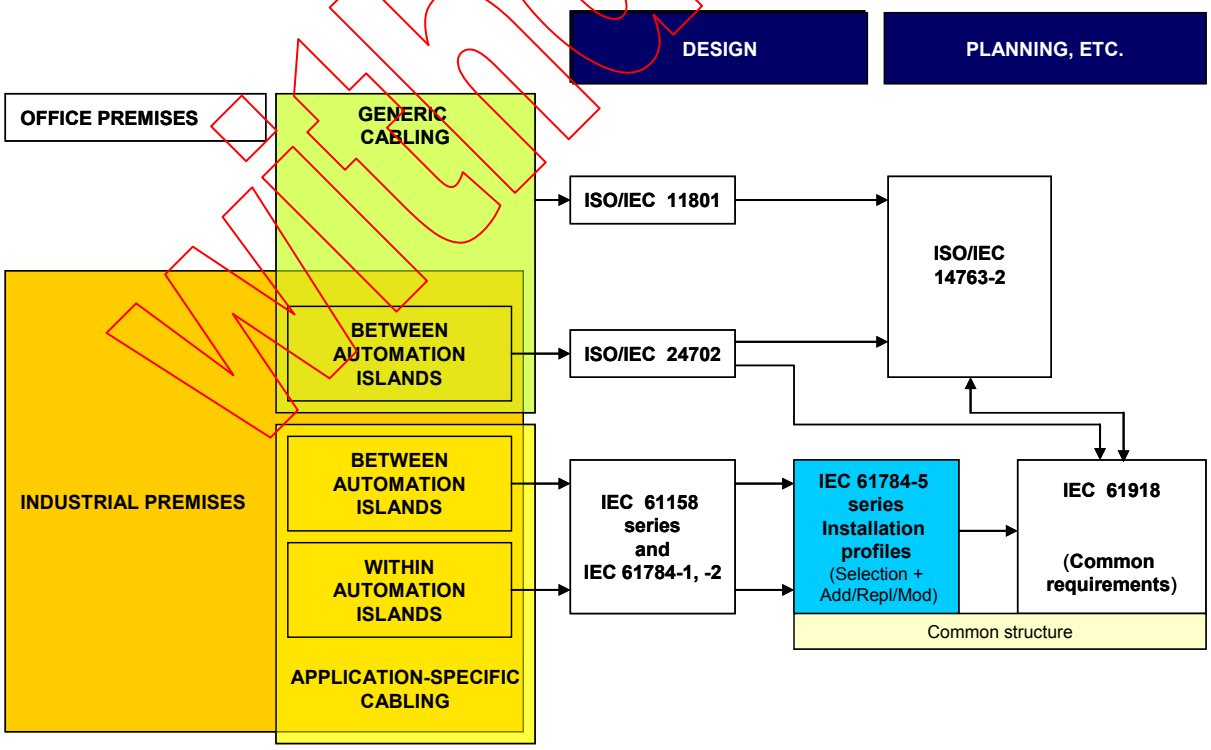

Figure 1 – Standards relationships

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INDUSTRIAL COMMUNICATION NETWORKS – PROFILES

Part 5-11: Installation of fieldbuses – Installation profiles for CPF 11

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1 Scope

This part of IEC 61784 specifies the installation profile for CPF 11 (TCnet[1]).

The installation profile is specified in the annex. This annex is 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 Clause A.2.

3 Terms, definitions and abbreviated terms

For the purpose of this document, the terms, definitions and abbreviated terms of IEC 61918:2007, Clause 3, apply.

4 CPF 11: Overview of installation profiles

CPF 11 consists of one CP (see IEC 61784-2).

The installation requirements for CP 11/1 are specified in Annex A.

5 Installation profile conventions

The numbering of the clauses and subclauses in the annexes of this standard corresponds to the numbering of IEC 61918:2007 main clauses and subclauses.

The annex clauses and subclauses of this standard supplement, modify, or replace the respective clauses and subclauses in IEC 61918:2007.

Where there is no corresponding subclause of IEC 61918:2007 in the normative annexes in this standard, the subclause of IEC 61918:2007 applies without modification.

The annex heading letter represents the installation profile assigned in Clause 4. The Annex heading number shall represent the corresponding numbering of IEC 61918:2007.

---

[1] TCnet is the technology name of the CPF11. TCnet is the trade name of TOSHIBA corporation, if used in Japan. 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. Use of the trade name requires permission of the trade name holder.

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EXAMPLE "Annex A.4.4" in IEC 61784-5-11 means that CP 11/1 specifies the Subclause 4.4 of IEC 61918:2007.

All main clauses of IEC 61918:2007 are cited and apply in full unless otherwise stated in each normative installation profile annex.

If all subclauses of a (sub)clause are omitted, then the corresponding IEC 61918 (sub)clause apply.

If in a (sub)clause it is written "Not applicable", then the corresponding IEC 61918 (sub)clause does not apply.

If in a (sub)clause it is written "Addition", then the corresponding IEC 61918 (sub)clause applies with the additions written in the profile.

If in a (sub)clause it is written "Replacement", then the text provided in the profile replaces the text of the corresponding IEC 61918 (sub)clause.

NOTE A replacement can also comprise additions.

If in a (sub)clause it is written "Modification", then the corresponding IEC 61918 (sub)clause applies with the modifications written in the profile.

If all (sub)clauses of a (sub)clause are omitted but in this (sub)clause it is written "(sub)clause x has "Addition" (or "Replacement", or "Modification") or is "Not applicable"", then (sub)clause x becomes valid as declared and all the other corresponding IEC 61918 (sub)clauses apply.

6 Conformance to installation profiles

Each installation profile within this standard includes part of the IEC 61918:2007. It may also include defined additional specifications.

A statement of compliance to an installation profile of this standard shall be stated[2] as either

Compliance to IEC 61784-5-11:2007[3] for CP 11/1 <name> or

Compliance to IEC 61784-5-11 (Ed.1.0) for CP 11/1 <name>

where the name within the angle brackets < > is optional and the angle brackets are not to be included.

NOTE The name may be the name of the profile, e.g. TCnet.

If the name is a trade name then the permission of the trade name holder shall be required.

Product standards shall not include any conformity assessment aspects (including quality management provisions), neither normative nor informative, other than provisions for product testing (evaluation and examination).

[2] In accordance with ISO/IEC Directives.

[3] The date should not be used when the edition number is used.

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Annex A
(normative)

CP 11/1 (TCnet) specific installation profile

A.1 Installation profile scope

This standard specifies the installation profile for Communication Profile CP 11/1 (TCnet). The CP 11/1 is specified in IEC 61784-2.

A.2 Normative references

Addition:

IEC 61754-18:2001, *Fibre optic connector interfaces – Part 18: Type MT-RJ connector family*

A.3 Installation profile terms, definitions, and abbreviated terms

A.4 Installation planning

A.4.1 Introduction

A.4.1.1 Objective

A.4.1.2 Cabling in industrial premises

A.4.1.3 The planning process

A.4.1.4 Specific requirements for CPs

Not applicable.

A.4.1.5 Specific requirements for generic cabling in accordance with ISO/IEC 24702

A.4.2 Planning requirements

A.4.2.1 Safety

A.4.2.1.1 General

A.4.2.1.2 Electrical safety

A.4.2.1.3 Functional safety

Not applicable.

A.4.2.1.4 Intrinsic safety

Not applicable.

A.4.2.1.5 Safety of optical fibre communication systems (OFCS)

A.4.2.2 Security

Not applicable.

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A.4.2.3 Environmental considerations and EMC

A.4.2.3.1 Description methodology

A.4.2.3.2 Use of the described environment to produce a bill of material

Addition:

Products certified as CP 11/1 shall be used for CP 11/1 network and be mentioned on the bill of material.

A.4.2.4 Specific requirements for generic cabling in accordance with ISO/IEC 24702

A.4.3 Network capabilities

A.4.3.1 Network topology

A.4.3.1.1 Common description

A.4.3.1.2 Basic physical topologies for passive networks

Modification:

For CP 11/1 network star topology applies.

A.4.3.1.3 Basic physical topologies for active networks

Modification:

For CP 11/1 network star topology applies.

A.4.3.1.4 Combination of basic topologies

Not applicable.

A.4.3.1.5 Specific physical topology requirements

Addition:

For CP 11/1 network only star topology applies.

For the branching devices in star topology network hubs fit and switches should not be applicable for highest performance.

Doubled redundant physical network is applicable.

A.4.3.1.6 Specific requirements for generic cabling in accordance with ISO 24702

A.4.3.2 Network characteristics

A.4.3.2.1 General

A.4.3.2.2 Network characteristics for balanced cabling not based on Ethernet

Not applicable.

A.4.3.2.3 Network characteristics for balanced cabling based on Ethernet

Replacement:

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Table A.1 provides values based on the template given in IEC 61918, Table 2.

Table A.1 – Network characteristics for balanced cabling based on Ethernet

Characteristic	CP 11/1
Supported data rates (Mbit/s)	100
Supported channel length (m) [b]	100
Number of connections in the channel (max.) [a] [b]	6
Patch cord length (m) [a]	100
Channel class per ISO/IEC 24702 (min.) [b]	D
Cable category per ISO/IEC 24702 (min.) [c]	5
Connecting HW category per ISO/IEC 24702 (min.)	5
Cable types	No requirement

[a] See 4.4.3.2.

[b] For the purpose of this table the channel definitions of ISO/IEC 24702 are applicable.

[c] Additional information is available in IEC 61156 series.

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A.4.3.2.4 Network characteristics for optical fibre cabling

Replacement:

Table A.2 provides values based on the template given in IEC 61918, Table 3

Table A.2 – Network characteristics for optical fibre cabling

CP 11/1		
Multimode silica	Standard	
	Attenuation coefficient at 1 310 nm	1,0 dB/km at 50/125 1,5 dB/km at 62,5/125
	Modal bandwidth (MHz x km) at 1 310 nm	600 MHz x km at 50/125 500 MHz x km at 62,5/125
	Alternative description	
	Core diameter (µm)	50, 62,5
	Outer diameter (µm)	125
	NA	0,21 ± 0,02 at 50/125 0,275 ± 0,02 at 62,5/125
	Minimum length (m)	0
	Maximum length (m)	2 000

A.4.3.2.5 Specific network characteristics

Not applicable.

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A.4.4 Selection and use of cabling components

A.4.4.1 Cable selection

A.4.4.1.1 Common description

A.4.4.1.2 Copper cables

Replacement:

Table A.3 provides values based on the template given in IEC 61918, Table 4.

Table A.3 – Information relevant to copper cable: fixed cables

Characteristic	CP 11/1
Nominal impedance of cable (tolerance)	100 Ω ± 15 Ω
DCR of conductors	< 9,38 Ω/100 m
DCR of shield	Not defined
Number of conductors	8
Shielding	Yes
Colour code for conductor	WH/OG, OG, WH/GN, BU, WH/BU, GN, WH/BN, BN
Jacket colour requirements	No requirement
Jacket material	No requirement
Resistance to harsh environment (e.g. UV, oil resist, LS0H)	No requirement
Agency ratings	No requirement

Replacement:

Table A.4 provides values based on the template given in IEC 61918, Table 5.

Table A.4 – Information relevant to copper cable: cords

Characteristic	CP 11/1
Nominal impedance of cable (tolerance)	100 Ω ± 15 Ω
DCR of conductors	< 9,38 Ω/100m
DCR of shield	Not defined
Number of conductors	8
Length	100m
Shielding	Yes
Colour code for conductor	WH/OG, OG, WH/GN, BU, WH/BU, GN, WH/BN, BN
Jacket colour requirements	No requirement
Jacket material	No requirement
Resistance to harsh environment (e.g. UV, oil resist, LS0H)	No requirement
Agency ratings	No requirement

A.4.4.1.3 Cable requirements for wireless installation

Not applicable.

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