

Industrial communication networks — Profiles —

Part 5-6: Installation of fieldbuses — Installation profiles for CPF 6

ICS 25.040.40; 35.100.05

National foreword

This British Standard is the UK implementation of EN 61784-5-6:2008. It is identical to IEC 61784-5-6:2007.

The UK participation in its preparation was entrusted to Technical Committee AMT/7, Industrial communications: process measurement and control, including fieldbus.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Installation profiles for CPF 6
(IEC 61784-5-6:2007)**

Réseaux de communication industriels -
Profils -
Partie 5-6: Installation des bus de terrain -
Profils d'installation pour CPF 6
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Industrielle Kommunikationsnetze -
Profile -
Teil 5-6: Feldbusinstallation -
Installationsprofile
für die Kommunikationsprofilfamilie 6
(IEC 61784-5-6:2007)

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

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CENELEC

European Committee for Electrotechnical Standardization
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Foreword

The text of document 65C/471/FDIS, future edition 1 of IEC 61784-5-6, 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 was approved by CENELEC as EN 61784-5-6 on 2008-05-01.

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- | | | |
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Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61784-5-6:2007 was approved by CENELEC as a European Standard without any modification.

CONTENTS

INTRODUCTION.....	6
1 Scope.....	7
2 Normative references.....	7
3 Terms, definitions and abbreviated terms.....	7
4 CPF 6: Overview of installation profiles.....	7
5 Installation profile conventions.....	7
6 Conformance to installation profiles.....	9
Annex A (Normative) CPF 6 Type 8 network specific installation profile.....	10
A.1 Installation profile scope.....	10
A.2 Normative references.....	10
A.3 Installation profile terms, definitions, and abbreviated terms.....	10
A.3.1 Terms and definitions.....	10
A.3.2 Abbreviated terms.....	11
A.3.3 Conventions for installation profiles.....	11
A.4 Installation planning.....	12
A.4.1 Introduction.....	12
A.4.2 Planning requirements.....	12
A.4.3 Network capabilities.....	13
A.4.4 Selection and use of cabling components.....	18
A.4.5 Cabling planning documentation.....	25
A.4.6 Verification of cabling planning specification.....	25
A.5 Installation implementation.....	25
A.5.1 General requirements.....	25
A.5.2 Cable installation.....	25
A.5.3 Connector installation.....	27
A.5.4 Terminator installation.....	29
A.5.5 Device installation.....	29
A.5.6 Coding and labeling.....	29
A.5.7 Earthing and bonding of equipment and devices and shield cabling.....	29
A.5.8 As-implemented cabling documentation.....	29
A.6 Installation verification and installation acceptance test.....	30
A.6.1 Introduction.....	30
A.6.2 Installation verification.....	30
A.6.3 Installation acceptance test.....	31
A.7 Installation administration.....	31
A.8 Installation maintenance and installation Troubleshooting.....	32
Annex B (Normative) CP 6/2 Ethernet network specific installation profile.....	33
B.1 Installation profile scope.....	33
B.2 Normative references.....	33
B.3 Installation profile terms, definitions, and abbreviated terms.....	33
B.3.1 Terms and definitions.....	33
B.3.2 Abbreviated terms.....	33
B.3.3 Conventions for installation profiles.....	33
B.4 Installation planning.....	34
B.4.1 Introduction.....	34
B.4.2 Planning requirements.....	34

B.4.3	Network capabilities	35
B.4.4	Selection and use of cabling components	38
B.4.5	Cabling planning documentation	44
B.4.6	Verification of cabling planning specification	44
B.5	Installation implementation	44
B.5.1	General requirements	44
B.5.2	Cable installation	44
B.5.3	Connector installation	46
B.5.4	Terminator installation	47
B.5.5	Device installation	47
B.5.6	Coding and labeling	47
B.5.7	Earthing and bonding of equipment and devices and shield cabling	48
B.5.8	As-implemented cabling documentation	48
B.6	Installation verification and installation acceptance test	48
B.6.1	Introduction	48
B.6.2	Installation verification	48
B.6.3	Installation acceptance test	48
B.7	Installation administration	48
B.8	Installation maintenance and installation Troubleshooting	48
Annex ZA (normative) Normative references to international publications with their corresponding European publications		50
Bibliography		49
Table A.1 – Basic network characteristics for balanced cabling not based on Ethernet		16
Table A.2 - Network characteristics for optical fibre cabling		17
Table A.3 – Information relevant to balanced cable: fixed cables		18
Table A.4 – Information relevant to balanced cable: cords		19
Table A.5 – Remote bus fibre optic cable length		21
Table A.6 – Connectors for balanced cabling CPs not based on Ethernet		22
Table A.7 – Optical fibre connecting hardware		22
Table A.8 – Colour code for balanced cables used by Type 8 networks		23
Table A.9 – Parameters for balanced cables		26
Table A.10 – Parameters for silica optical fibre cables		26
Table A.11 – Parameters for POF optical fibre cables		26
Table A.12 – Parameters for hard claddeed silica optical fibre cables		27
Table A.13 – Pin assignment of the terminal connector		29
Table B.1 – Network characteristics for balanced cabling based on Ethernet		36
Table B.2 - Network characteristics for optical fibre cabling		37
Table B.3 – Information relevant to balanced cable: fixed cables		38
Table B.4 – Information relevant to balanced cable: cords		39
Table B.5 — Information relevant to optical fibre cables		40
Table B.6 – Connectors for balanced cabling CPs based on Ethernet		41
Table B.7 – Optical fibre connecting hardware		41
Table B.8 – Dimensions of the sealed SC-RJ free connector		42
Table B.9 – Dimensions of the sealed SC-RJ fixed adaptor		42

Table B.10 – Typical parameters for copper cables.....	45
Table B.11 – Typical parameters for Silica fibre cables	45
Table B.12 – POF fibre cables.....	45
Table B.13 – Hard cladde silca fibre cables	46
Table B.14 – Connector pin assignment	47
Figure 1 – Standards relationships	6
Figure A.1 – Type 8 network structure example	14
Figure A.2 – Example of a Type 8 network configuration.....	15
Figure A.3 – Sub-D connector pin assignments.....	28
Figure A.4 – M23 circular connector pin assignments	28
Figure A.5 – M12 circular connector pin assignments	29
Figure A.6 – Terminal connector at the device	29
Figure B.1 – Sealed SC-RJ free connector	42
Figure B.2 – Sealed SC-RJ fixed adaptor.....	43
Figure B.3 – Terminal connector at the device	47
Figure B.4 – Pin numbering	47

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 61784-5-6 for CPF 6), allows readers to work with standards of a convenient size.

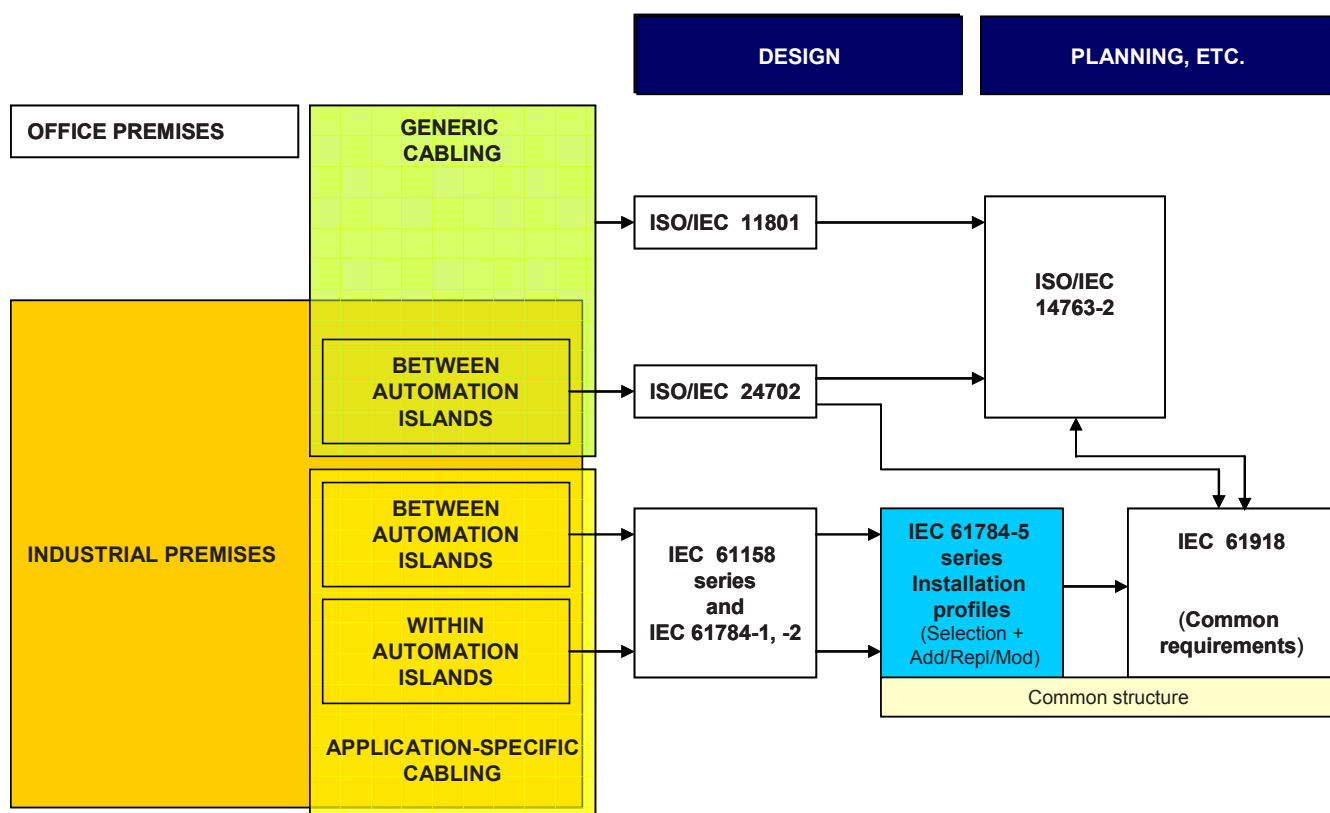


Figure 1 – Standards relationships

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)¹.

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.

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. For profile specific terms, definitions and abbreviated terms see A.3 and B.3 .

4 CPF 6: Overview of installation profiles

CPF 6 consists of seven CPs (see IEC 61784-1 for CP 6/1, CP 6/2, CP 6/3, see 61784-2 for CP 6/4, CP 6/5, CP 6/6, see 61784-3-6 for FSCP 6/7).

The CPF 6 Type 8 network (non Ethernet based) installation profile is specified in Annex A.

The CP 6/2 Ethernet specific installation profile file is specified in Annex B

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.

¹ 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.

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.

EXAMPLE “Annex A.4.4” in IEC 61784-5-6 means that the installation profile for the Type 8 network profiles 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 applies.

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 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 IEC 61918:2007. It may also include defined additional specifications.

A statement of compliance to the installation profile specified in Annex A shall be stated² as

Compliance to IEC 61784-5-6:2007 for CPF 6 Type 8 Network <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. INTERBUS.

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

A statement of compliance to the installation profile specified in Annex B shall be stated² as

Compliance to IEC 61784-5-6:2007 for CP 6/2 Ethernet Network

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.

Annex A (Normative)

CPF 6 Type 8 network specific installation profile

A.1 Installation profile scope

Addition:

This annex specifies the installation profile for Type 8 networks and the related Communication Profiles:

- CP 6/1, CP 6/2, CP 6/3 - specified in IEC 61784-1;
- CP 6/4, CP 6/5, CP 6/6 - specified in IEC 61784-2;
- FSCP 6/7 - specified in IEC 61784-3-6.

A.2 Normative references

Addition:

IEC 60794-1-2:2003, *Optical fibre cables – Part 1-2: Generic specification – Basic optical cable test procedures*

IEC 61156-1 (Ed. 2.0), *Multicore and symmetrical pair/quad cables for digital communications – Part 1: Generic specification*

IEC 61156-5 (Ed. 1.0), *Multicore and symmetrical pair/quad cables for digital communications – Part 5: Symmetrical pair/quad cables with transmission characteristics up to 600 MHz – Horizontal floor wiring – Sectional specification*

NOTE EN 50377-6-1 is under consideration as IEC 61754-24.

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

A.3.1 Terms and definitions

Addition:

A.3.1.1

bus coupler

a device that divides the Type 8 network into segments by opening the ring and integrating another ring at this point

A.3.1.2

local bus

a ring segment of a Type 8 network with alternate media specifications, which is coupled to a remote bus via a bus coupler

A.3.1.3

local bus device

device that operates as a slave on a local bus

A.3.1.4

master

device that controls the data transfer on the Type 8 network and initiates the media access of the slaves by sending messages and that constitutes the interface to the control system

A.3.1.5

remote bus

a ring segment of a network

A.3.1.6

remote bus

device operating as a slave on a remote bus

A.3.1.7

remote bus link

connection of two remote bus devices

A.3.1.8

ring segment

one section of a Type 8 network

A.3.1.9

slave

a device that accesses the medium only after it has been initiated by the preceding slave or master

A.3.2 Abbreviated terms

Addition:

BC	Bus coupler
COM	Ground line
/DI	Incoming interface: send data line – Outgoing interface: receive data line –
DI	Incoming interface: send data line + Outgoing interface: receive data line +
/DO	Incoming interface: receive data line – Outgoing interface: send data line –
DO	Incoming interface: receive data line + Outgoing interface: send data line +
PELV	Protective Extra Low Voltage
POF	Plastic Optical Fibre
SELV	Safety Extra Low Voltage

A.3.3 Conventions for installation profiles

Not applicable.

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 24702

Not applicable.

A.4.2 Planning requirements

A.4.2.1 Safety

A.4.2.1.1 General

A.4.2.1.2 Electrical safety

Addition:

Power distribution system shall comply with IEC 60364-1 312.2.1 TN-S systems, i.e. earthed by bonding of bodies with separated conductors for neutral (N) and protection earth (PE). Otherwise there are additional efforts necessary to avoid currents on the shield, i.e. an a.c. earthed system on one end in a network with balanced cables or a network built with FO-cables. For networks built with OF-cables the power distribution system should comply with IEC 60364-1 312.2.1 TN S systems.

PELV is the default version for the power supply with extra-low-voltage, but SELV is also possible. Temporary connected devices shall be powered by PELV or SELV

A.4.2.1.3 Functional safety

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

A.4.2.3 Environmental considerations and EMC

A.4.2.3.1 Description methodology

Addition:

To make fieldbus installation work easier for inexperienced planners, the user shall determine suitability of the components for the targeted environment through agreements with the component providers. The planner shall also observe the related technical data from the active devices. Depending on the expected environment he should define additional requirements.

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

Addition:

The planner shall take into account the mating or terminating interface of devices to be connected to the fieldbus network.

The planner also shall take care about the environmental conditions of the whole Type 8 network and select suitable mitigation techniques in addition to meet the respective requirements. Products necessary for mitigation also shall be mentioned in the bill of material.

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

Not applicable.

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

Not applicable.

A.4.3.1.3 Basic physical topologies for active networks

Modification:

For Type 8 networks only the ring topology specified in IEC 61158-2:2007 shall be used.

NOTE The Type 8 ring topology is achieved with specific cables and resembles a linear tree topology. Further explanation of the physical layer of Type 8 networks can be found in IEC 61158-2.

A.4.3.1.4 Combination of basic topologies

Replacement:

The combination of several topologies is possible according to A.4.4.1.5

A.4.3.1.5 Specific physical topology requirements for CPs

Addition:

The general structure is a ring topology with special cables to build tree like configurations. Bus couplers allow a branch from the remote bus to the local bus or to a further remote bus. Figure A.1 shows a Type 8 network structure example. There is no limit for the sub-leveling of remote buses. Only one local bus can be connected to a remote bus. A maximum from 63 devices can be connected to one local bus.

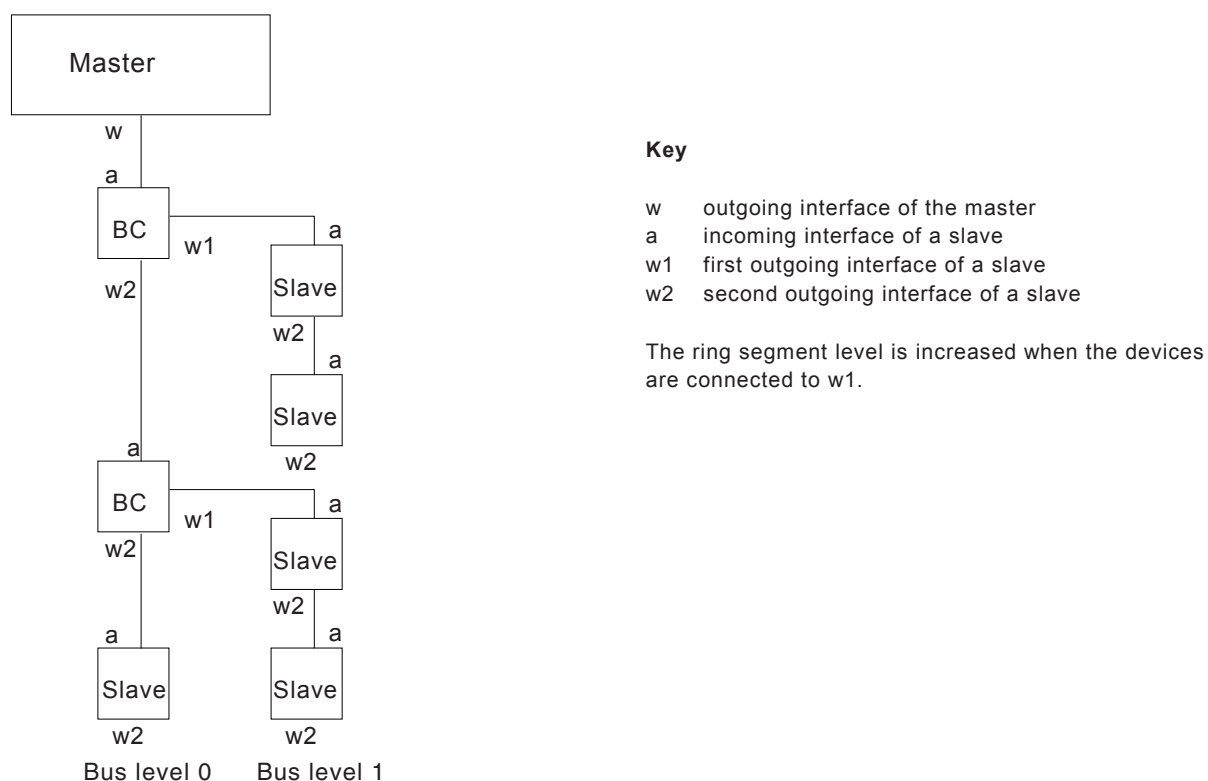


Figure A.1 – Type 8 network structure example

The remote bus link length (i.e. the cable between two devices on a remote bus link) shall be between 0 m and the maximum length for the used bit rate (see Table A.1). The local bus link length (i.e. the cable between two devices on a local bus link) shall be between 0 m and 10 m. Figure A.2 shows a Type 8 network configuration example with bus length indications.

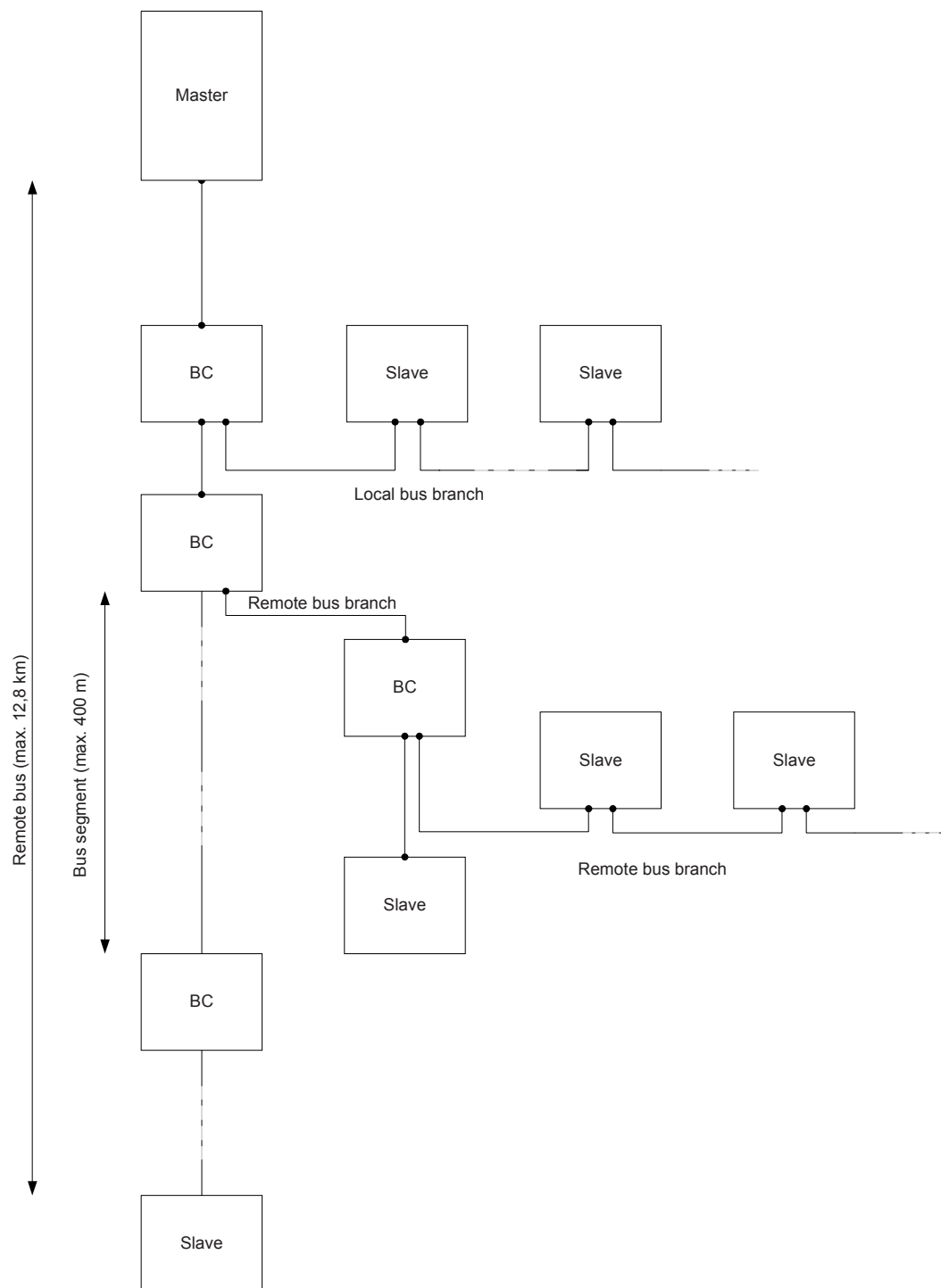


Figure A.2 – Example of a Type 8 network configuration

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

Not applicable.