SVENSK STANDARD SS-EN 61784-1

Fastställd	Utgåva	Sida	Ansvarig kommitté
2009-02-23	1	1 (1+269)	SEK TK 65

Industriell processtyrning – Profiler – Del 1: Fältbussprofiler

Industrial communication networks – Profiles – Part 1: Fieldbus profiles

Som svensk standard gäller europastandarden EN 61784-1:2008. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61784-1:2008.

Nationellt förord

Europastandarden EN 61784-1:2008

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC

IEC 61784-1, Second edition, 2007 - Industrial communication networks - Profiles - Part 1: Fieldbus profiles

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 61491, utgåva 1, 1998, gäller ej fr o m 2011-02-01. SS-EN 61491, utgåva 1, 1998 ersätts även delvis av SS-EN 61158-2, utgåva 1, 2008, SS-EN 61158-3-16, utgåva 1, 2008 och SS-EN 61158-5-16, utgåva 1, 2008.

ICS 35.240.50; 35.100.20

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61784-1

June 2008

ICS 35.240.50; 35.100.20

Supersedes EN 61491:1998 (partially) and EN 61784-1:2004

English version

Industrial communication networks - Profiles - Part 1: Fieldbus profiles

(IEC 61784-1:2007)

Réseaux de communication industriels - Profils - Partie 1: Profils pour les bus de terrain (CEI 61784-1:2007)

Industrielle Kommunikationsnetze - Profile - Teil 1: Feldbusprofile (IEC 61784-1:2007)

This European Standard was approved by CENELEC on 2008-05-01. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. EN 61784-1:2008 E

SEK Svensk Elstandard

Foreword

The text of document 65C/294/FDIS, future edition 2 of IEC 61784-1, 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 61784-1 on 2008-05-01.

This European Standard supersedes EN 61784-1:2004 + corrigendum December 2004.

This standard also partially replaces EN 61491:1998 which is at present being revised (to be issued as a Technical Report).

EN 61784-1:2008 includes the following significant technical changes from EN 61784-1:2004:

– partition of EN 61158 Parts 3, 4 ,5, and 6 into multiple parts numbered for example EN 61158-6-1, -6-2, -6-3, …;

– deletion of Type 6 fieldbus in EN 61158 series and CPF 7 for lack of market relevance;

– addition of new types of fieldbuses in EN 61158 series leading to new CPF 8, 9, and 16.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2009-02-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2011-05-01

Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 61784-1:2007 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60793	NOTE	Harmonized in EN 60793 series (partially modified).
IEC 61131-3	NOTE	Harmonized as EN 61131-3:2003 (not modified).
ISO/IEC 9506-1	NOTE	Harmonized as EN ISO/IEC 29506-1:1993 (not modified).
ISO/IEC 9506-2	NOTE	Harmonized as EN ISO/IEC 29506-2:1990 (not modified).

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60079-11	- [1)]	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"	EN 60079-11	2007 [2)]
IEC 60079-14	2002	Electrical apparatus for explosive gas atmospheres - Part 14: Electrical installations in hazardous areas (other than mines)	EN 60079-14	2003
IEC 60079-25	- [1)]	Electrical apparatus for explosive gas atmospheres - Part 25: Intrinsically safe systems	EN 60079-25 + corr. April	2004 [2)] 2006
IEC 60079-27	- [1)]	Explosive atmospheres - Part 27: Fieldbus intrinsically safe concept (FISCO)	EN 60079-27	2008
IEC 61010	Series	Safety requirements for electrical equipment for measurement, control, and laboratory use	EN 61010	Series
IEC 61131-2	- [1)]	Programmable controllers - Part 2: Equipment requirements and tests	EN 61131-2	2007
IEC 61158	Series	Industrial communication networks - Fieldbus specifications	EN 61158	Series
IEC 61784-2	- [1)]	Industrial communication networks - Profiles - Part 2: Additional fieldbus profiles for real-time networks based on ISO/IEC 8802-3	EN 61784-2	2008
IEC 61784-5-2	- [1)]	Industrial communication networks - Profiles - Part 5-2: Installation of fieldbuses - Installation profiles for CPF 2	EN 61784-5-2	2008
IEC 61918 (mod)	- [1)]	Industrial communication networks - Installation of communication networks in industrial premises	EN 61918	2008
IEC 62026-3	- [1)]	Low-voltage switchgear and controlgear - Controller-device interfaces (CDIs) - Part 3: DeviceNet	EN 62026-3	- [3)]

[1)] Undated reference.

[2)] Valid edition at date of issue.

[3)] At draft stage.

Publication	Year	Title	EN/HD	Year
ISO/IEC 7498-1	- [1)]	Information technology - Open Systems Interconnection - Basic Reference Model: The Basic Model	EN ISO/IEC 7498-1	1995 [2)]
ISO/IEC 7498-2	- [1)]	Information processing systems - Open systems interconnection - Basic reference model - Part 2: Security architecture	-	-
ISO/IEC 7498-3	- [1)]	Information technology - Open systems interconnection - Basic reference model - Part 3: Naming and addressing	-	-
ISO/IEC 8802-2	1998	Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 2: Logical link control	-	-
ISO/IEC 8802-3	2000	Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications	-	-
ISO 11898-1	- [1)]	Road vehicles - Controller area network (CAN) - Part 1: Data link layer and physical signalling	-	-
ISO 11898-2	- [1)]	Road vehicles - Controller area network (CAN) - Part 2: High-speed medium access unit	-	-
ISO 15745-3	- [1)]	Industrial automation systems and integration - Open systems application integration framework - Part 3: Reference description for IEC 61158 based control systems	-	-
ISO 15745-4 A1	2003 2006	Industrial automation systems and integration - Open systems application integration framework - Part 4: Reference description for Ethernet-based control systems	-	-
ANSI TIA/EIA-232-F	1997	Interface between data terminal equipment and data circuit - Terminating equipment employing serial binary data interchange	-	-
ANSI TIA/EIA-422-B	1994	Electrical characteristics of balanced voltage digital interface circuits	-	-
ANSI TIA/EIA-485-A	1998	Electrical Characteristics of Generators and Receivers for Use in Balanced Digital Multipoint Systems	-	-
IEEE 802.3	2002	IEEE Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) - Access Method and Physical Layer Specifications	-	-

Publication	Year	Title	EN/HD	Year
IETF RFC	- [1)]	Internet Engineering Task Force - Request for Comments	-	-
IETF RFC 768	- [1)]	User Datagram Protocol	-	-
IETF RFC 791	- [1)]	Internet Protocol - DARPA Internet Program Protocol Specification	-	-
IETF RFC 792	- [1)]	Internet Control Message Protocol - DARPA Internet Program Protocol Specification	-	-
IETF RFC 793	- [1)]	Transmission Control Protocol - DARPA Internet Program Protocol Specification	-	-
IETF RFC 826	- [1)]	Ethernet Address Resolution Protocol - Converting Network Protocol Addresses to 48.bit Ethernet Address for Transmission on Ethernet Hardware	-	-
IETF RFC 894	- [1)]	Standard for the Transmission of IP Datagrams over Ethernet Networks	-	-
IETF RFC 1112	- [1)]	Host Extensions for IP Multicasting	-	-
IETF RFC 1122	- [1)]	Requirements for Internet Hosts - Communication Layers	-	-
IETF RFC 1123	- [1)]	Requirements for Internet Hosts - Application and Support	-	-
IETF RFC 1127	- [1)]	A Perspective on the Host Requirements RFCs	-	-
IETF RFC 2236	- [1)]	Internet Group Management Protocol - Version 2	-	-

CONTENTS

INTRODUCTION

This part of IEC 61784 provides a set of Communication Profiles (CP) in the sense of ISO/IEC TR 10000-1. These answer the need of identifying the protocol families co-existing within the IEC 61158 series, as a result of the international harmonization of fieldbus technologies available on the market. More specifically, these profiles help to correctly state the compliance to the IEC 61158 series, and to avoid the spreading of divergent implementations, which would limit its use, clearness and understanding. Additional profiles to address specific market concerns, such as functional safety or information security, may be addressed by future parts of this standard.

This standard contains several Communication Profile Families (CPF), which specify one or more communication profiles. Such profiles identify, in a strict sense, protocol subsets of the IEC 61158 series via protocol specific communication profiles. They do not define device-type-specific communication profiles for the purpose of guiding manufacturers in feature set selection – for example, in selecting the minimum set of communication services and protocol to implement a specific class of devices, such as generic slaves or transmitters ("implementation profiles"). Neither do they define device profiles that specify communication profiles together with application functions needed to answer the need of a specific application ("application profiles").

It is agreed that these latter classes of profiles would help the use of the IEC 61158 series of standards; the profiles defined in this document are a necessary step to achieve that task.

It is also important to clarify that interoperability — defined as the ability of two or more network systems to exchange information and to make mutual use of the information that has been exchanged (see 3.2.1 of ISO/IEC TR 10000-1) — can be directly achieved on the same link only for those devices complying to the same communication profile.

Profiles contained in this International Standard are constructed of references to IEC 61158-2 and the IEC 61158-3, IEC 61158-4, IEC 61158-5 and IEC 61158-6 series, and other IS, TS or worldwide-accepted standards, as appropriate[1]. Each profile is required to reference at least one (sub)part of IEC 61158-2 through IEC 61158-6.

Two or more Profiles, which are related to a common family, are specified within a "Communication Profile Family" (CPF).

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[1] International Standardised Profiles may contain normative references to specifications other than International Standards; see ISO/IEC JTC 1 N 4047.

INDUSTRIAL COMMUNICATION NETWORKS – PROFILES –

Part 1: Fieldbus profiles

1 Scope

This part of IEC 61784 defines a set of protocol specific communication profiles based primarily on the IEC 61158 series, to be used in the design of devices involved in communications in factory manufacturing and process control.

Each profile selects specifications for the communications protocol stack at a device. It contains a minimal set of required services at the Application Layer and specification of options in intermediate layers defined through references. If no Application Layer is included, then a minimal set of required services at the Data-link layer is specified. The appropriate references to the protocol specific types are given in each communication profile family or associated profiles.

NOTE All profiles are based on standards or draft standards or International Standards published by the IEC or from standards or International Standards established by other standards bodies or open standards processes.

The structure of communication profile families is specified in Figure 1.

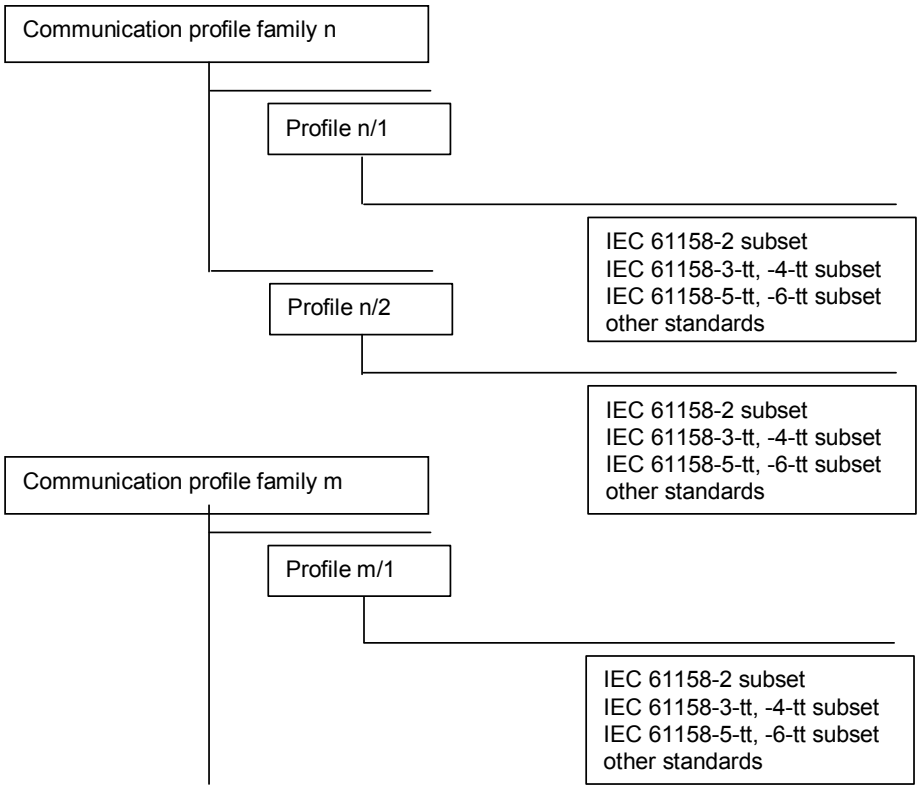

Figure 1 — Communication profile families and profiles

Each profile selects an appropriate consistent and compatible subset of services and protocols from the total available set that is defined and modeled in IEC 61158. For the selected subset of services and protocols, the profile also describes any possible or necessary constrains in parameter values.

Table 1 shows the communication profile families that are defined in this standard.

Table 1 – Relations of Communication Profile Families to type numbers

IEC 61784-1 contents			Corresponding IEC 61158 Types	
CPF	**Clause**	**Communication Profile Families** (Note 1)	**Type**	
1	5	FOUNDATION® Fieldbus	1, 5, 9	(see Note 2)
2	6	CIP™	2	
3	7	PROFIBUS & PROFINET	3, 10	(see Note 3)
4	8	P-NET®	4	
5	9	WorldFIP®	7	
6	10	INTERBUS®	8	
7	11	Has been removed based for lack of market relevance	6	
8	12	CC-Link	18	
9	13	HART	20	
16	14	SERCOS	16	

NOTE 1 See the specific CPF clauses for information on the respective trademark holders.

NOTE 2 CP 1/1 has a denigrated PhL device profile subclass, which uses a variant of a Type 3 PhL.

NOTE 3 CP 3/2 has a denigrated PhL device profile subclass, which uses a variant of a Type 1 PhL.

NOTE 4 Other CPFs can be found in IEC 61784-2.

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 to the IEC 61158 series, only the edition published contemporaneously with this edition of these profiles applies. For all other undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60079-11, *Electrical apparatus for explosive gas atmospheres – Part 11: Intrinsic safety "i"*

IEC 60079-14:2002, *Electrical apparatus for explosive gas atmospheres – Part 14: Electrical installations in hazardous areas (other than mines)*

IEC 60079-25, *Electrical apparatus for explosive gas atmospheres – Part 25: Intrinsically safe systems*

IEC 60079-27, *Electrical apparatus for explosive gas atmospheres – Part 27: Fieldbus intrinsically safe concept (FISCO) and fieldbus non-incendive concept (FNICO)*

IEC 61010 (all parts), *Safety requirements for electrical equipment for measurement, control and laboratory use*

IEC 61131-2, *Programmable controllers – Part 2: Equipment requirements and tests*

IEC 61158 (all parts), *Industrial communication networks – Fieldbus specifications*

IEC 61784-2, *Industrial communication networks – Profiles – Part 2: Additional fieldbus profiles for real-time networks based on ISO/IEC 8802-3*

IEC 61784-5-2, *Industrial communication networks – Profiles – Part 5-2: Installation of fieldbuses – Installation profiles for CPF 2*