



# SLOVENSKI STANDARD

## SIST EN 61784-3-18:2011

01-september-2011

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### Industrijska komunikacijska omrežja - Profili - 3-18. del: Funkcijska varnost procesnih vodil - Dodatne specifikacije za CPF 18 (IEC 61784-3-18:2011)

Industrial communication networks - Profiles - Part 3-18: Functionnal safety fieldbuses - Additional specifications for CPF 18 (IEC 61784-3-18:2011)

Industrielle Kommunikationsnetze - Profile - Teil 3-18: Funktional sichere Übertragung bei Feldbussen - Zusätzliche Festlegungen für die Kommunikationsprofilfamilie 18 (IEC 61784-3-18:2011)

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Réseaux de communication industriels - Profils - Partie 3-18: Bus de terrain à sécurité fonctionnelle - Spécifications supplémentaires pour le CPF 18 (CEI 61784-3-18:2011)

Ta slovenski standard je istoveten z: EN 61784-3-18:2011

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#### ICS:

25.040.40	Merjenje in krmiljenje industrijskih postopkov	Industrial process measurement and control
35.100.05	Večslojne uporabniške rešitve	Multilayer applications

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 61784-3-18**

July 2011

ICS 13.110; 25.040.40; 35.100.05

English version

**Industrial communication networks -  
Profiles -  
Part 3-18: Functional safety fieldbuses -  
Additional specifications for CPF 18  
(IEC 61784-3-18:2011)**

Réseaux de communication industriels -  
Profils -  
Partie 3-18: Bus de terrain à sécurité  
fonctionnelle -  
Spécifications supplémentaires pour le  
CPF 18  
(CEI 61784-3-18:2011)

Industrielle Kommunikationsnetze -  
Profile -  
Teil 3-18: Funktional sichere Übertragung  
bei Feldbussen -  
Zusätzliche Festlegungen für die  
Kommunikationsprofilfamilie 18  
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Comité Européen de Normalisation Electrotechnique  
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**Management Centre: Avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of document 65C/639/FDIS, future edition 1 of IEC 61784-3-18, 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 61784-3-18 on 2011-05-25.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

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) 2012-02-25
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2014-05-25

Annex ZA has been added by CENELEC.

## Endorsement notice

The text of the International Standard IEC 61784-3-18:2011 was approved by CENELEC as a European Standard without any modification.

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

IEC 60204-1	NOTE	Harmonized as EN 60204-1:2011
IEC 61131-6	NOTE	Harmonized as EN 61131-6 <sup>1)</sup>
IEC 61158 series	NOTE	Harmonized in EN 61158 series.
IEC 61326-3-1	NOTE	Harmonized as EN 61326-3-1.
IEC 61326-3-2	NOTE	Harmonized as EN 61326-3-2.
IEC 61496 series	NOTE	Harmonized in EN 61496 series.
IEC 61508-1:2010	NOTE	Harmonized as EN 61508-1:2010.
IEC 61508-4:2010	NOTE	Harmonized as EN 61508-4:2010.
IEC 61508-5:2010	NOTE	Harmonized as EN 61508-5:2010.
IEC 61511 series	NOTE	Harmonized in EN 61511 series.
IEC 61784-1	NOTE	Harmonized as EN 61784-1.
IEC 61784-5 series	NOTE	Harmonized in EN 61784-5 series.
IEC 61800-5-2	NOTE	Harmonized as EN 61800-5-2.
IEC 62061	NOTE	Harmonized as EN 62061.
ISO 10218-1	NOTE	Harmonized as EN ISO 10218-1.
ISO 12100-1	NOTE	Harmonized as EN ISO 12100-1.
ISO 13849-1	NOTE	Harmonized as EN ISO 13849-1.

<sup>1)</sup> At draft stage.

ISO 13849-2 NOTE Harmonized as EN ISO 13849-2.

ISO 14121 NOTE Harmonized as EN ISO 14121.

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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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61158-3-22	-	Industrial communication networks - Fieldbus - specifications - Part 3-22: Data-link layer service definition - Type 22 elements	-	-
IEC 61158-4-22	-	Industrial communication networks - Fieldbus - specifications - Part 4-22: Data-link layer protocol specification - Type 22 elements	-	-
IEC 61158-5-22	-	Industrial communication networks - Fieldbus - specifications - Part 5-22: Application layer service definition - Type 22 elements	-	-
IEC 61158-6-22	-	Industrial communication networks - Fieldbus - specifications - Part 6-22: Application layer protocol specification - Type 22 elements	-	-
IEC 61508	Series	Functional safety of electrical/electronic/programmable electronic safety-related systems	EN 61508	Series
IEC 61508-2	2010	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems	EN 61508-2	2010
IEC 61784-2	2010	Industrial communication networks - Profiles - Part 2: Additional fieldbus profiles for real-time networks based on ISO/IEC 8802-3	EN 61784-2	2010
IEC 61784-3	2010	Industrial communication networks - Profiles - Part 3: Functional safety fieldbuses - General rules and profile definitions	EN 61784-3	2010
IEC 61918	-	Industrial communication networks - Installation of communication networks in industrial premises	EN 61918	-
ISO/IEC 10731	-	Information technology - Open Systems Interconnection - Basic reference model - Conventions for the definition of OSI services	-	-



IEC 61784-3-18

Edition 1.0 2011-04

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



**Industrial communication networks – Profiles**  
**Part 3-18: Functional safety fieldbuses – Additional specifications for CPF 18**

**Réseaux de communication industriels – Profils**  
**Partie 3-18: Bus de terrain de sécurité fonctionnelle – Spécifications**  
**supplémentaires pour le CPF 18**

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COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**INDUSTRIAL COMMUNICATION NETWORKS –  
PROFILES**
**Part 3-18: Functional safety fieldbuses –  
Additional specifications for CPF 18**

## 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.
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International Standard IEC 61784-3-18 has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial process measurement, control and automation.

This standard cancels and replaces IEC/PAS 61784-3-18 published in 2009. This first edition constitutes a technical revision.

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

FDIS	Report on voting
65C/639/FDIS	65C/649/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 61784-3 series, published under the general title *Industrial communication networks – Profiles – Functional safety fieldbuses*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability 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.

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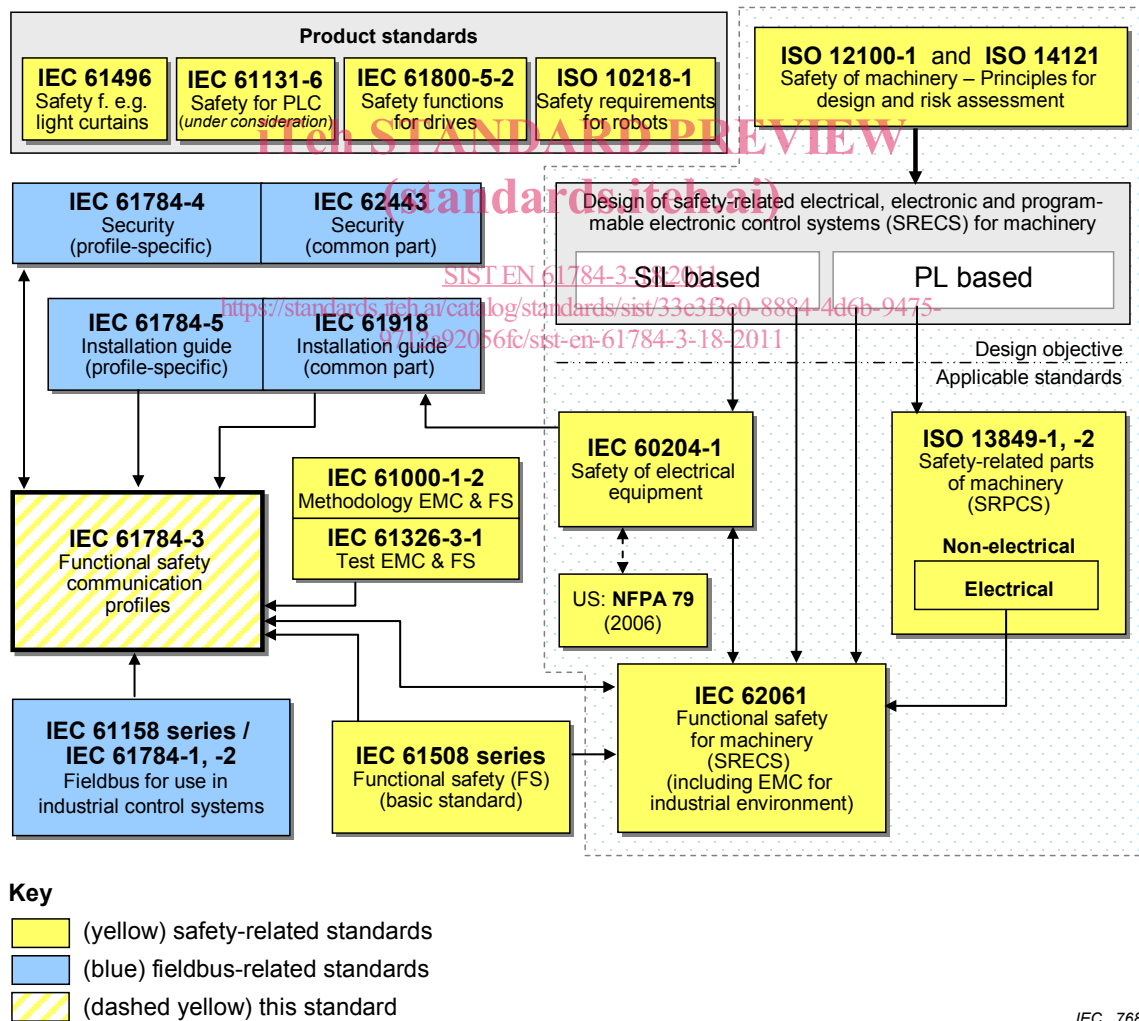
## 0 Introduction

### 0.1 General

The IEC 61158 fieldbus standard together with its companion standards IEC 61784-1 and IEC 61784-2 defines a set of communication protocols that enable distributed control of automation applications. Fieldbus technology is now considered well accepted and well proven. Thus many fieldbus enhancements are emerging, addressing not yet standardized areas such as real time, safety-related and security-related applications.

This standard explains the relevant principles for functional safety communications with reference to IEC 61508 series and specifies several safety communication layers (profiles and corresponding protocols) based on the communication profiles and protocol layers of IEC 61784-1, IEC 61784-2 and the IEC 61158 series. It does not cover electrical safety and intrinsic safety aspects.

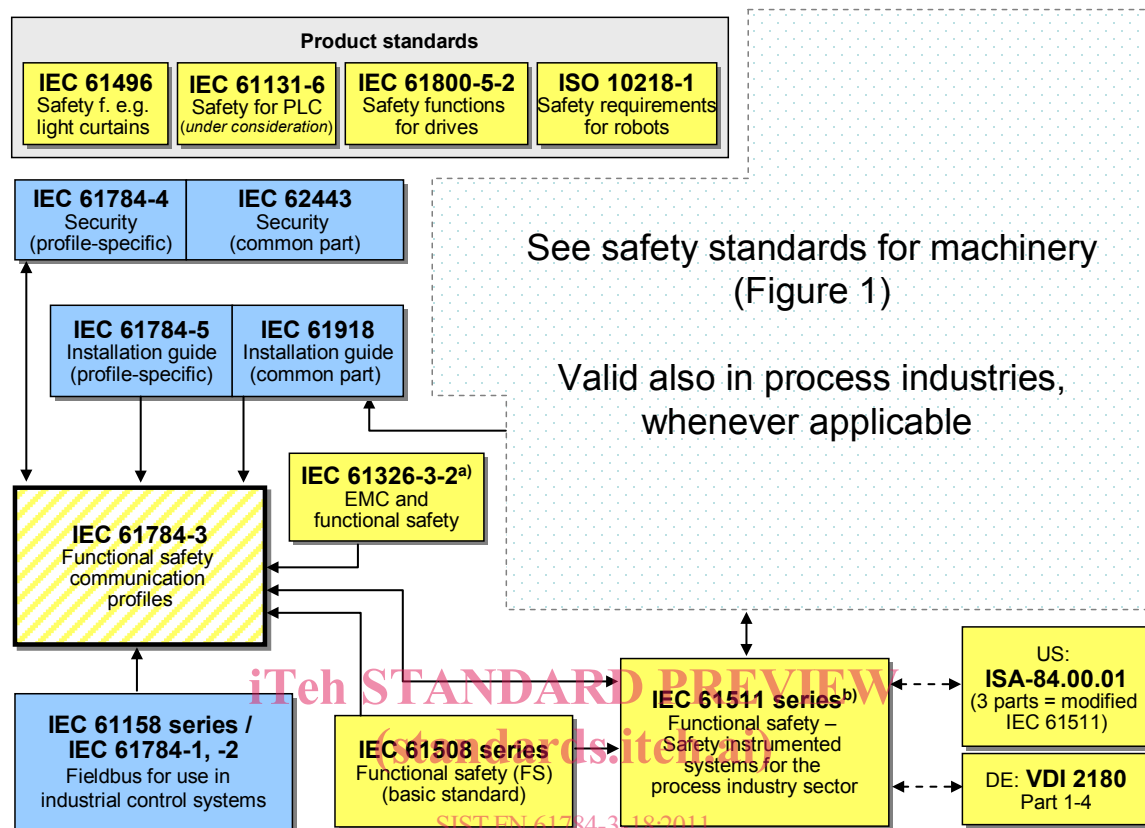
Figure 1 shows the relationships between this standard and relevant safety and fieldbus standards in a machinery environment.



NOTE Subclauses 6.7.6.4 (high complexity) and 6.7.8.1.6 (low complexity) of IEC 62061 specify the relationship between PL (Category) and SIL.

**Figure 1 – Relationships of IEC 61784-3 with other standards (machinery)**

Figure 2 shows the relationships between this standard and relevant safety and fieldbus standards in a process environment.



#### Key

- (yellow) safety-related standards
- (blue) fieldbus-related standards
- (dashed yellow) this standard

IEC 769/11

<sup>a</sup> For specified electromagnetic environments; otherwise IEC 61326-3-1.

<sup>b</sup> EN ratified.

**Figure 2 – Relationships of IEC 61784-3 with other standards (process)**

Safety communication layers which are implemented as parts of safety-related systems according to IEC 61508 series provide the necessary confidence in the transportation of messages (information) between two or more participants on a fieldbus in a safety-related system, or sufficient confidence of safe behaviour in the event of fieldbus errors or failures.

Safety communication layers specified in this standard do this in such a way that a fieldbus can be used for applications requiring functional safety up to the Safety Integrity Level (SIL) specified by its corresponding functional safety communication profile.

The resulting SIL claim of a system depends on the implementation of the selected functional safety communication profile within this system – implementation of a functional safety communication profile in a standard device is not sufficient to qualify it as a safety device.

This standard describes:

- basic principles for implementing the requirements of IEC 61508 series for safety-related data communications, including possible transmission faults, remedial measures and considerations affecting data integrity;
- individual description of functional safety profiles for several communication profile families in IEC 61784-1 and IEC 61784-2;
- safety layer extensions to the communication service and protocols sections of the IEC 61158 series.

## 0.2 Patent declaration

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning the functional safety communication profiles for family 18 as follows, where the [xx] notation indicates the holder of the patent right:

DE 10 2008 007 672.4-31 [PI] Verfahren und Vorrichtung zum Übertragen von Daten in einem Netzwerk

IEC takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the IEC that he/she is willing to negotiate licences either free of charge or under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with IEC. Information may be obtained from:

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