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**Industrial communication networks – Profiles –
Part 3-19: Functional safety fieldbuses – Additional specifications for CPF 19**

**Réseaux de communication industriels – Profils –
Partie 3-19: Bus de terrain de sécurité fonctionnelle – Spécifications
supplémentaires pour CPF 19**



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IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INDUSTRIAL COMMUNICATION NETWORKS –
PROFILES –****Part 3-19: Functional safety fieldbuses –
Additional specifications for CPF 19****FOREWORD**

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The text of this International Standard is based on the following documents:

Draft	Report on voting
65C/1276/CDV	65C/1298/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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 document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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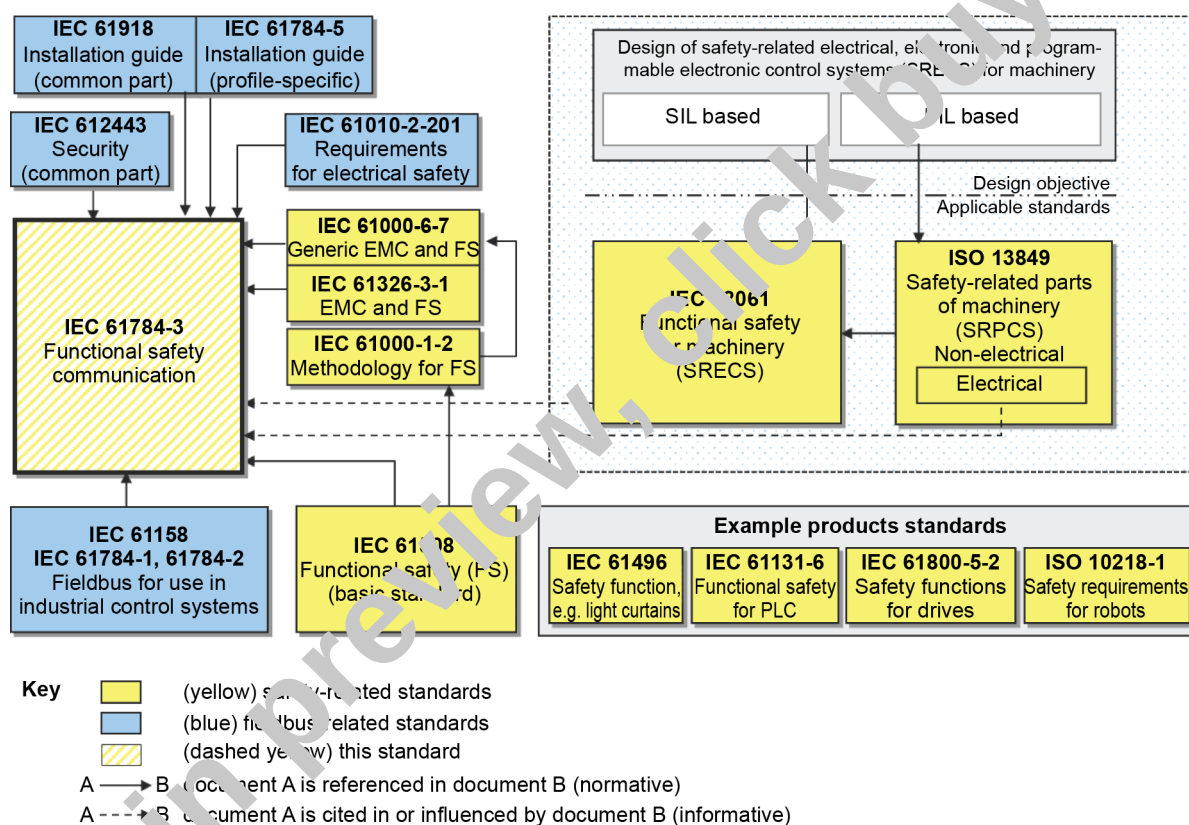
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INTRODUCTION

The IEC 61158 fieldbus standard series together with its companion standards series 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, fieldbus enhancements continue to emerge, addressing applications for areas such as real time and safety-related applications.

The IEC 61784-3 series explains the relevant principles for functional safety communications with reference to the IEC 61508 series and specifies several safety communication layers (profiles and corresponding protocols) based on the communication profiles and protocol layers of the IEC 61784-1, IEC 61784-2 and IEC 61158 series. It does not cover electrical safety and intrinsic safety aspects. It also does not cover security aspects, nor does it provide any requirements for security.

Figure 1 shows the relationships between the IEC 61784-3 series and relevant safety and fieldbus standards in a machinery environment.

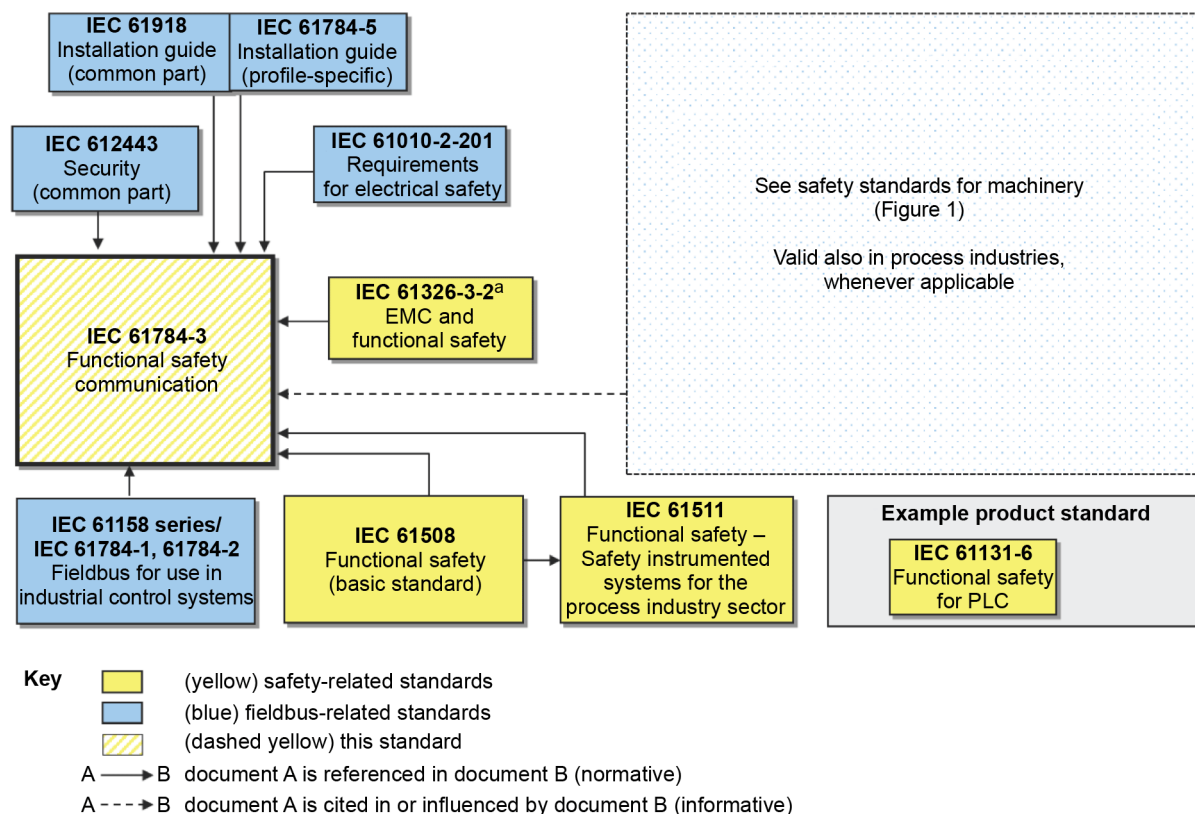


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NOTE 1 IEC 62061 specifies the relationship between PL (Category) and SIL.

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

Figure 2 shows the relationships between the IEC 61784-3 series and relevant safety and fieldbus standards in a process environment.



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^a For specified electromagnetic environments; otherwise IEC 61326-3-1 or IEC 61000-6-7.

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 the 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 the IEC 61784-3 series 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 (FSCP) within this system – implementation of a functional safety communication profile in a standard device is not sufficient to qualify it as a safety device.

The IEC 61784-3 series describes:

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

INDUSTRIAL COMMUNICATION NETWORKS – PROFILES –

Part 3-19: Functional safety fieldbuses – Additional specifications for CPF 19

1 Scope

This part of IEC 61784-3 specifies a safety communication layer (services and protocol) based on IEC 61784-1-19, IEC 61784-2-19 and the IEC 61158 series (Type 24 and Type 27). It identifies the principles for functional safety communications defined in IEC 61784-3 that are relevant for this safety communication layer. This safety communication layer is intended for implementation in safety devices only.

NOTE 1 It does not cover electrical safety and intrinsic safety aspects. Electrical safety relates to hazards such as electrical shock. Intrinsic safety relates to hazards associated with potentially explosive atmospheres.

This document defines mechanisms for the transmission of safety-relevant messages among participants within a distributed network using fieldbus technology in accordance with the requirements of the IEC 61508 series¹ for functional safety. These mechanisms can be used in various industrial applications such as process control, manufacturing automation and machinery.

This document provides guidelines for both developers and assessors of compliant devices and systems.

NOTE 2 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 according to this document in a standard device is not sufficient to qualify it as a safety device.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 61131-2, *Industrial-process measurement and control – Programmable controllers – Part 2: Equipment requirements and tests*

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

IEC 61158-6-24, *Industrial communication networks – Fieldbus specifications – Part 6-24: Application layer protocol specification – Type 24 elements*

IEC 61158-6-27, *Industrial communication networks – Fieldbus specifications – Part 6-27: Application layer protocol specification – Type 27 elements*

IEC 61326-3-1, *Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 3-1: Immunity requirements for safety-related systems and for equipment intended to perform safety-related functions (functional safety) – General industrial applications*

¹ In the following pages of this document, "IEC 61508" will be used for "the IEC 61508 series".