



**SLOVENSKI STANDARD**  
**SIST EN 61784-3-18:2011/A1:2017**  
**01-julij-2017**

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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/A1:2016)**

Industrial communication networks - Profiles - Part 3-18: Functional safety fieldbuses - Additional specifications for CPF 18 (IEC 61784-3-18:2011/A1:2016)

Industrielle Kommunikationsnetze - Profile - Teil 3-18: Funktional sichere Übertragung bei Feldbussen - Zusätzliche Festlegungen für die Kommunikationsprofilfamilie 18 (IEC 61784-3-18:2011/A1:2016)

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Réseaux de communication industriels - Profils - Partie 3-18: Bus de terrain de sécurité fonctionnelle - Spécifications supplémentaires pour le CPF 18 (IEC 61784-3-18:2011/A1:2016)

**Ta slovenski standard je istoveten z: EN 61784-3-18:2011/A1:2017**

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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

**SIST EN 61784-3-18:2011/A1:2017**      **en,fr,de**

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EUROPEAN STANDARD

EN 61784-3-18:2011/A1

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EUROPÄISCHE NORM

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English Version

Industrial communication networks - Profiles -  
Part 3-18: Functional safety fieldbuses - Additional specifications  
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Kommunikationsprofilfamilie 18  
(IEC 61784-3-18:2011/A1:2016)

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

**EN 61784-3-18:2011/A1:2017****European foreword**

This document (EN 61784-3-18:2011/A1:2017) consists of the text of IEC 61784-3-18:2011/A1:2016 prepared by SC 65C “Industrial networks” of IEC/TC 65 “Industrial process measurement, control and automation”.

The following dates are fixed:

- latest date by which the document has to be implemented (dop) 2018-01-16  
at national level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2020-01-16

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

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The text of the International Standard IEC 61784-3-18:2011/A1:2016 was approved by CENELEC as a European Standard without any modification.

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# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

AMENDMENT 1  
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**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**

INTERNATIONAL  
ELECTROTECHNICAL  
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## FOREWORD

This amendment has been prepared by subcommittee 65C: Industrial networks, of IEC technical committee 65: Industrial-process measurement, control and automation.

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

FDIS	Report on voting
65C/851/FDIS	65C/854/RVD

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

The committee has decided that the contents of this amendment and the base 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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## 5 General

### 5.2 Safety functional requirements

Add, in this subclause, at the end of the list, the following new items:

- For devices using protocol version 2 (see 7.1.3.4) it is required to add  $10^{-9}$  to the PFH of the device hardware to account for the communication channel.

NOTE In this way, the user of the device will not have to account for the number of logical connections within a safety function.

- The use of error correction mechanisms in the black channel is permitted.

## 7 Safety communication layer protocol

### 7.1.2.1 SPDO structure

Replace, in this subclause, the existing Table 4 by the following new table:

**Table 4 – SPDO PDU structure**

Octet offset	Data field	Description
0 to 2	PID	Packet ID
3	Length	Length of the complete packet in octets
4 to 4+n-1	Safety data 1	Mapped safety application process data
4+n to 5+n	SID 1	Safety ID of the sender
6+n to 6+n+m-1	Consecutive number 1	Consecutive number for sequencing and application monitoring where: $m = 1$ for protocol version 1 $m = 3$ for protocol version 2
7+n+m to 10+n+m	CRC 1	32 bit cyclic redundancy check covering data fields PID, safety data 1, SID 1 and consecutive number 1
11+n+m to 11+2n-1+m	Safety data 2	Copy of mapped safety application process data
11+2n+m to 12+2n+m	SID 2	Copy of SID 1
13+2n+m to 13+2n+2m-1	Consecutive number 2	Copy of consecutive number 1
14+2n+2m to 17+2n+2m	CRC 2	32 bit cyclic redundancy check covering data fields PID, safety data 2, SID 2 and consecutive number 2
NOTE 1 $n$ is the length in octets of the data field safety data 1 (safety data 2).		
NOTE 2 $m$ is the length of the consecutive number depending on the protocol version (see 7.1.3.4).		

### 7.1.2.4 Safety data

Replace, in this subclause, second paragraph:

“117 octets” by “115 octets for protocol version 2 or respectively 117 octets for protocol version 1”.

### 7.1.2.6 SPDO consecutive number

Replace, in this subclause, “an 8 bit” by “a”.

Add, at the end of this subclause, the following text:

The size of the consecutive number depends on the protocol version (see 7.1.3.4) and is 1 octet for protocol version 1 and 3 octets for protocol version 2.

**7.1.2.7 SPDO CRC**

Delete, in this subclause, first paragraph, "length".

**7.1.3.1.1 SHB request PDU****Table 5 – SHB request PDU structure**

Replace, in this subclause, the existing Table 5 by the following new table:

**Table 5 – SHB request PDU structure**

Octet offset	Data field	Description
0 to 2	PID	Packet ID
3	Length	Length of the complete packet in octets
4	SCL state 1	SALMT state (see Table 7)
5 to 5+n-1	Safety AP state 1	Safety application process state (implementation specific)
6+n to 7+n	SID 1	Safety ID of the sender
8+n to 8+n+m-1	Consecutive number 1	Consecutive number for sequencing and application monitoring where: $m = 1$ for protocol version 1 $m = 3$ for protocol version 2
9+n+m to 12+n+m	CRC 1	32 bit cyclic redundancy check covering data fields PID, SCL state 1, Safety AP state 1, SID 1 and consecutive number 1
13+n+m	SCL state 2	Copy of SALMT state 1
14+n+m to 14+2n+m-1	Safety AP state 2	Copy of safety application process state 1
15+2n+m to 16+2n+m	SID 2	Copy of SID 1
17+2n+m to 17+2n+2m-1	Consecutive number 2	Copy of consecutive number 1
18+2n+2m to 21+2n+2m	CRC 2	32 bit cyclic redundancy check covering data fields PID, SCL state 2, Safety AP state 2, SID 2 and consecutive number 2
NOTE 1 $n$ is the length in octets of the data field Safety AP state.		
NOTE 2 $m$ is the length of the consecutive number, depending on the protocol version (see 7.1.3.4).		



**7.1.3.1.2 SHB response PDU****Table 6 – SHB response PDU structure**

Replace, in this subclause, the existing Table 6 by the following new table:

**Table 6 – SHB response PDU structure**

Octet offset	Data field	Description
0 to 2	PID	Packet ID
3	Length	Length of the complete packet in octets
4 to 5	SID 1	Safety ID of the sender
6 to 6+m-1	Consecutive number 1	Consecutive number for sequencing and application monitoring where: $m = 1$ for protocol version 1 $m = 3$ for protocol version 2
7+m to 10+m	CRC 1	32 bit cyclic redundancy check covering data fields PID, SID 1 and consecutive number 1
11+m to 12+m	SID 2	Copy of SID 1
13+m to 13+2m-1	Consecutive number 2	Copy of consecutive number 1
14+2m to 17+2m	CRC 2	32 bit cyclic redundancy check covering data fields PID, SID 2 and consecutive number 2
NOTE $m$ is the length of the consecutive number, depending on the protocol version (see 7.1.3.4).		

**7.1.3.4 SHB safety communication layer state****Table 7 – SHB safety communication layer state encoding**

<https://standards.iteh.ai/catalog/standards/sist/e79ec4fc-9c21-48b9-ab51-3812461784-3-18/2011/a1/2017>

Replace, in this subclause, the existing Table 7 by the following new table:

**Table 7 – SHB safety communication layer state encoding**

Value	Description	Protocol
0x00	FS FAL is in BOOTUP state	Version 1
0x04	FS FAL is in STOPPED state	Version 1
0x05	FS FAL is in OPERATIONAL state	Version 1
0x7F	FS FAL is in PRE-OPERATIONAL state	Version 1
0x10	FS FAL is in BOOTUP state	Version 2
0x14	FS FAL is in STOPPED state	Version 2
0x15	FS FAL is in OPERATIONAL state	Version 2
0x1F	FS FAL is in PRE-OPERATIONAL state	Version 2

Add, in this subclause, after Table 7, as last paragraph:

The device shall support at least one protocol version. The FS FAL state shall be encoded according to Table 7 depending on the used protocol version. It is recommended to support all protocol versions.

**7.1.3.5 SHB safety AP state**

Replace, in the last sentence of this subclause: “116 octets” by “114 octets for protocol version 2 or respectively 116 octets for protocol version 1”.