SLOVENSKI STANDARD
oSIST prEN IEC 62769-101-1:2018

01-december-2018

Vključitev procesne naprave (FDI) - 101-1. del: Profili - Procesno vodilo sklada H1

Field device Integration (FDI) - Part 101-1: Profiles - Foundation Fieldbus H1

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Intégration des appareils de terrain (FDI) - Partie 101-1: Profils - Foundation Fieldbus H1

Ta slovenski standard je istoveten z: **prEN IEC 62769-101-1:2018**

SIST-EN IEC 62769-101-1:2021
https://standards.iteh.ai/catalog/standards/sist/717bbd47-92f4-427d-af73-3faec3e639c3/sist-en-iec-62769-101-1-2021

ICS:

25.040.40	Merjenje in krmiljenje industrijskih postopkov	Industrial process measurement and control
35.240.50	Uporabniške rešitve IT v industriji	IT applications in industry

oSIST prEN IEC 62769-101-1:2018 **en,fr,de**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

oSIST prEN IEC 62769-101-1:2018

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN IEC 62769-101-1:2021
https://standards.iteh.ai/catalog/standards/sist/717bbd47-92f4-427d-af73-3faec3e639c3/sist-en-iec-62769-101-1-2021

oSIST prEN IEC 62769-101-1:2018

65E/620/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: **IEC 62769-101-1 ED2**	
DATE OF CIRCULATION: **2018-10-05**	CLOSING DATE FOR VOTING: **2018-12-28**
SUPERSEDES DOCUMENTS: **65E/539/RR**	

IEC SC 65E : DEVICES AND INTEGRATION IN ENTERPRISE SYSTEMS

SECRETARIAT: United States of America	SECRETARY: Mr Donald (Bob) Lattimer
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.

FUNCTIONS CONCERNED:

☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY

☒ SUBMITTED FOR CENELEC PARALLEL VOTING	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING
Attention IEC-CENELEC parallel voting The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN IEC 62769-101-1:2021
https://standards.iteh.ai/catalog/standards/sist/717bbd47-92f4-427d-af73-3faec3e639c3/sist-en-iec-62769-101-1-2021

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

Field device Integration (FDI) - Part 101-1: Profiles - Foundation Fieldbus H1

PROPOSED STABILITY DATE: 2023

NOTE FROM TC/SC OFFICERS:

Copyright © 2018 International Electrotechnical Commission, IEC. All rights reserved. It is permitted to download this electronic file, to make a copy and to print out the content for the sole purpose of preparing National Committee positions. You may not copy or "mirror" the file or printed version of the document, or any part of it, for any other purpose without permission in writing from IEC.

oSIST prEN IEC 62769-101-1:2018

CONTENTS

iTeh STANDARD PREVIEW
(standards.iteh.ai)

oSIST prEN IEC 62769-101-1:2018

iTeh STANDARD PREVIEW
(standards.iteh.ai)
oSIST prEN IEC 62769-101-1:2021
https://standards.iteh.ai/catalog/standards/sist/717bbd47-92f4-427d-af73-3faec3e639c3/sist-en-iec-62769-101-1-2021

oSIST prEN IEC 62769-101-1:2018

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

FIELD DEVICE INTEGRATION (FDI) –

Part 101-1: Profiles – Foundation Fieldbus H1

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.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62769-101-1 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation.

This second edition cancels and replaces the first edition published in 2015. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) support for generic protocol extension for faster adoption of other technologies;
b) support for Package Developers to build EDDs targeted for today's EDD bases system under a single development tool;

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

oSIST prEN IEC 62769-101-1:2018

FDIS	Report on voting
65E/XX/FDIS	65E/XX/RVD

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62769 series, published under the general title Field Device Integration (FDI), 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 "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

iTeh STANDARD PREVIEW

The National Committees are requested to note that for this document the stability date is 2023

(standards.iteh.ai)

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE.

SIST EN IEC 62769-101-1:2021
https://standards.iteh.ai/catalog/standards/sist/717bbd47-92f4-427d-af73-3faec3e639c3/sist-en-iec-62769-101-1-2021

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

oSIST prEN IEC 62769-101-1:2018

FIELD DEVICE INTEGRATION (FDI) –

Part 101-1: Profiles – Foundation Fieldbus H1

1 Scope

This part of IEC 62769 specifies an FDI profile of IEC 62769 for IEC 61784-1_CP 1/1 (FOUNDATION™ Fieldbus H1)[1].

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 61158-5-9:2007, *Industrial communication networks - Fieldbus specifications – Part 5-9: Application layer service definition – Type 9 elements*

IEC 61784-1, *Industrial communication networks—Profiles—Part 1: Fieldbus Profiles*

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

IEC 61784-3:2010, *Industrial communication networks – Profiles – Part 3: Functional safety fieldbuses – General rules and profile definitions*

IEC 61804 (all parts), *Function blocks (FB) for process control and Electronic Device Description Language (EDDL)*

IEC 62541-100, *OPC Unified Architecture – Part 100: OPC UA for Devices*

IEC 62769-1, *Field Device Integration (FDI) – Part 1: Overview*

IEC 62769-2, *Field Device Integration (FDI) – Part 2: FDI Client*

IEC 62769-3, *Field Device Integration (FDI) – Part 3: FDI Server*

IEC 62769-4, *Field Device Integration (FDI) – Part 4: FDI Packages*

IEC 62769-5, *Field Device Integration (FDI) – Part 5: FDI Information Model*

IEC 62769-6, *Field Device Integration (FDI) – Part 6: FDI Technology Mapping*

IEC 62769-7, *Field Device Integration (FDI) – Part 7: FDI Communication Devices*

3 Terms, definitions, abbreviated terms and conventions

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62769-1 apply.

[1] FOUNDATION™ Fieldbus is the trade name of the non-profit consortium Fieldbus Foundation. This information is given for the convenience of users of this standard and does not constitute an endorsement by IEC of the trademark holder or any of its products. Compliance does not require use of the trade name. Use of the trade name requires permission of the trade name holder.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN IEC 62769-101-1:2021
https://standards.iteh.ai/catalog/standards/sist/717bbd47-92f4-427d-af73-3faec3e639c3/sist-en-iec-62769-101-1-2021

oSIST prEN IEC 62769-101-1:2018

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at https://www.iso.org/obp
- IEC Electropedia: available at http://www.electropedia.org/

3.2 Abbreviated terms

For the purposes of this document, the following abbreviations apply:

CFF	common file format
CP	communication profile (see IEC 61784-1 or IEC 61784-2)
CPF	communication profile family (see IEC 61784-1 or IEC 61784-2)
EDD	Electronic Device Description (see IEC 61804)
FB	function block
IM	Information Model
SMIB	system management information base
VFD	virtual field device

iTeh STANDARD PREVIEW
(standards.iteh.ai)

3.3 Conventions

3.3.1 EDDL syntax

This part of IEC 62769 specifies content for the EDD component that is part of an FDI Communication Package. EDDL syntax uses the font Courier New. EDDL syntax is used for method signature, variable, data structure and component declarations.

SIST EN IEC 62769-101-1:2021
en-iec-62769-101-1-2021

3.3.2 XML syntax

XML syntax examples use the font Courier New. The XML syntax is used to describe XML document schema.

Example: <xsd:simpleType name="Example">.

3.3.3 Capitalizations

The IEC 62769 series uses capitalized terms to emphasize that these terms have an FDI specific meaning.

Some of these terms use an acronym as a prefix for example

- FDI Client, or
- FDI Server.

Some of these terms are compound terms such as:

- Communication Servers, or
- Profile Package.

Parameter names or attributes are concatenated to a single term, where the original terms start in this term with a capital letter such as:

- ProtocolSupportFile, or
- ProtocolType.

oSIST prEN IEC 62769-101-1:2018

Parameter names or attributes can also be constructed by using an underscore character to concatenate two or more terms such as:

- PROFILE_ID, or
- Profibus_PA_Network.

4 Profile for CP 1/1 (FOUNDATION™ H1)

4.1 General

This profile specifies the protocol specifics needed for FDI Packages describing communication servers, gateways and devices.

4.2 Catalog profile

4.2.1 Protocol support file

4.2.1.1 Capability file

Each CP 1/1 FDI Device Package shall contain a capability file. The capability file part is described in Table 1.

Table 1 – Capability File part

Parameter	Description
Content Type:	txt/plain
Root Namespace:	Not applicable
Source Relationship:	http://fdi-cooperation.com/2010/relationships/attachment-protocol
Filename:	Use file extension .CFF

iTeh STANDARD PREVIEW
(standards.iteh.ai)
oSIST prEN IEC 62769-101-1:2021
https://standards.iteh.ai/catalog/standards/sist/717bbd47-9214-427d-af73-3faec3e639c3/sist-en-iec-62769-101-1-2021

4.2.2 CommunicationProfile definition

IEC 62769-4 defines a CommunicationProfileT string type for the Catalog XML schema. Table 2 defines the CP 1/1 specific values for this string.

Table 2 – CommunicationProfile definition

CommunicationProfile	Description
foundation_h1	CP 1/1 device type with a function block application

4.2.3 Profile device

Not supported in this standard.

4.2.4 Protocol version information

IEC 62769-4 defines an element type named InterfaceT for the Catalog XML Schema. Element type InterfaceT contains an element named Version which is supposed to provide version information about the applied communication protocol profile. The value follows the IEC 62769-4 defined version information schema defined in element type VersionT.

The major version part of VersionT shall be set to the ITK_VER parameter. The minor and builds parts shall be set to 0.

EXAMPLE For ITK_VER 5, the value for InterfaceT is 5.0.0.

oSIST prEN IEC 62769-101-1:2018

4.3 Associating a Package with a CP 1/1 device

4.3.1 Device type identification mapping

CP 1/1 device types are uniquely identified by the parameters MANUFAC_ID, DEVICE_TYPE and DEV_REV found in the Resource Block. These parameters are used to associate a given device instance to an FDI Device Package. These parameters are mapped to the FDI Device Package Catalog according to Table 3.

Table 3 – Device type catalog mapping

Catalog Element	CP Mapping
Manufacturer element of InterfaceT (IEC 62769-4)	MANUFAC_ID String format “0xdddd” where dddd is the MANUFAC_ID number in hexadecimal format.
DeviceModel element of InterfaceT (IEC 62769-4)	DEVICE_TYPE String format “0xdddd” where dddd is the DEVICE_TYPE number in hexadecimal format.
DeviceRevision element ListOfSupportedDeviceRevisionsT (IEC 62769-4)	DEV_REV String format “x.0.0” where x is the DEV_REV in decimal format (no leading zeros).

4.3.2 Device type revision mapping

Each device type is identified according to 4.3.1. A device may also include a parameter COMPATIBILITY_REV from the Resource Block. This parameter specifies the lowest device version (DEV_REV) that a new device can replace while maintaining compatibility with a prior FDI Device Package.

4.4 Information Model mapping

4.4.1 ProtocolType definition

Table 4 defines the ProtocolType used to identify CP 1/1 network communications.

Table 4 – ProtocolType Foundation_H1 definition

Attribute	Value				
BrowseName	Foundation_H1				
IsAbstract	False				
References	**NodeClass**	**BrowseName**	**DataType**	**TypeDefinition**	**ModellingRule**
Inherits the properties of ProtocolType defined in IEC 62541-100.					

4.4.2 DeviceType mapping

Each device type inherits the properties of the DeviceType. The mapping of the inherited properties from the DeviceType is defined in Table 5.

Table 5 – Inherited DeviceType Property mapping

Property	CP Mapping
SerialNumber	DEV_ID (System Management Information Base)
RevisionCounter	-1 (not defined)
Manufacturer	String obtained from FDI package catalog (ManufacturerName from PackageT)
Model	String obtained from FDI package catalog (Name of DeviceTypeT, which is a localized name)

oSIST prEN IEC 62769-101-1:2018

Property	CP Mapping
DeviceManual	entry text string (not supported) [a]
DeviceRevision	DEV_REV (Resource Block)
SoftwareRevision	SOFTWARE_REV (if available, otherwise empty string)
HardwareRevision	HARDWARE_REV (if available, otherwise empty string)

[a] Device manuals are exposed as attachments of the FDI Device Package.

4.4.3 FunctionalGroup Identification definition

As defined in IEC 62541-100, each device representation in the FDI Server hosted Information Model shall contain a protocol specific FunctionalGroup called Identification. This FunctionalGroup organizes variables found in the Resource Block of the device type instance. The FunctionalGroup Identification for CP 1/1 is defined in Table 6.

Table 6 – Identification Parameters

BrowseName	DataType	Optional/Mandatory
MANUFAC_ID	UInt32	Mandatory
DEV_TYPE	UInt16	Mandatory
DEV_REV	UInt8	Mandatory
HARDWARE_REV	String	Optional
SOFTWARE_REV	String	Optional
COMPATIBILITY_REV	UInt8	Optional
CAPABILITY_LEV	UInt8	Optional
ITK_VER	UInt16	Mandatory
SIF_ITK_VER	UInt16	Optional
FD_VER	UInt16	Optional

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN IEC 62769-101-1:2021
https://standards.iteh.ai/catalog/standards/sist/717bbd47-92f0-...-af73-3faee3e639e3/sist-...-62769-101-1-2021

4.4.4 BlockType property mapping

CP 1/1 device types are block-oriented according to IEC 62541-100. IEC 62769-5 specifies the mapping of EDDL BLOCK_A elements to block types and instances

The BLOCK_A maps as a subtype of the topology element BlockType and inherits the properties per IEC 62541-100. The mapping of the inherited properties of the BlockType is specified in Table 7.

Table 7 – Inherited BlockType property mapping

Property	CP Mapping (Block ParameterSet)
RevisionCounter	ST_REV
ActualMode	MODE_BLK.ACTUAL
PermittedMode	MODE_BLK.PERMITTED
NormalMode	MODE_BLK.NORMAL
TargetMode	MODE_BLK.TARGET

4.4.5 Mapping to Block ParameterSet

The ParameterSet is relative to each Block. The ParameterSet includes the CHARACTERISTICS records of the block and all the parameters found in the PARAMETERS, LOCAL_PARAMETERS and LIST_ITEMS.

The browse name of the parameters found in the PARAMETERS and LOCAL_PARAMETERS is the member name in the respective lists. For example, ST_REV is the browse name of the Static