



SLOVENSKI STANDARD
SIST EN IEC 62453-71:2024

01-april-2024

Specifikacija vmesnika orodja procesne naprave - 71. del: OPC UA informacijski model za orodje procesne naprave (IEC 62453-71:2023)

Field device tool (FDT) interface specification - Part 71: OPC UA Information Model for FDT (IEC 62453-71:2023)

Field Device Tool (FDT)-Schnittstellenspezifikation - Teil 71: OPC UA Information Modell für FDT (IEC 62453-71:2023)

Spécification des interfaces des outils des dispositifs de terrain (FDT) - Partie 71: Modèle d'information de l'OPC UA pour outils FDT

Ta slovenski standard je istoveten z: EN IEC 62453-71:2023

[SIST EN IEC 62453-71:2024](https://standards.sist.si/standards/sist/62453-71:2024/iec/62453-71:2023)

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

SIST EN IEC 62453-71:2024

en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN IEC 62453-71

December 2023

ICS 25.040

English Version

**Field device tool (FDT) interface specification - Part 71: OPC UA
Information Model for FDT
(IEC 62453-71:2023)**

Spécification des interfaces des outils des dispositifs de terrain (FDT) - Partie 71: Modèle d'information de l'OPC UA pour outils FDT
(IEC 62453-71:2023)

Field Device Tool (FDT)-Schnittstellenspezifikation - Teil 71: OPC UA Information Modell für FDT
(IEC 62453-71:2023)

This European Standard was approved by CENELEC on 2023-12-06. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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

[SIST EN IEC 62453-71:2024](https://standards.iteh.ai)

<https://standards.iteh.ai/catalog/standards/sist/56cf233b-87bd-4a2e-87e0-dafabbd8f7be/sist-en-iec-62453-71-2024>



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN IEC 62453-71:2023 (E)

European foreword

The text of document 65E/806/CDV, future edition 1 of IEC 62453-71, prepared by SC 65E "Devices and integration in enterprise systems" of IEC/TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62453-71:2023.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2024-09-06 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2026-12-06 document have to be withdrawn

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

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 62453-71:2023 was approved by CENELEC as a European Standard without any modification.

iTeh Standards
https://standards.iteh.ai/
Document Preview

[SIST EN IEC 62453-71:2024](https://standards.iteh.ai/catalog/standards/sist/56cf233b-87bd-4a2e-87e0-dafabbd8f7be/sist-en-iec-62453-71-2024)

<https://standards.iteh.ai/catalog/standards/sist/56cf233b-87bd-4a2e-87e0-dafabbd8f7be/sist-en-iec-62453-71-2024>

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62453-1	2023	Field device tool (FDT) interface specification - Part 1: Overview and guidance	EN IEC 62453-1	— ¹
IEC 62453-2	2022	Field device tool (FDT) interface specification - Part 2: Concepts and detailed description	EN IEC 62453-2	2022
IEC 62541-3	2020	OPC Unified Architecture - Part 3: Address Space Model	EN IEC 62541-3	2020
IEC 62541-5	2020	OPC Unified Architecture - Part 5: Information Model	EN IEC 62541-5	2020
IEC 62541-6	-	OPC Unified Architecture - Part 6: Mappings	EN IEC 62541-6	-
IEC 62541-7	-	OPC unified architecture - Part 7: Profiles	EN IEC 62541-7	-
IEC 62541-8	-	OPC Unified Architecture - Part 8: Data Access	EN IEC 62541-8	-
IEC 62541-100	2015	OPC Unified Architecture - Part 100: Device Interface	EN 62541-100	2015

¹ Under preparation. Stage at time of publication: prEN IEC 62453-1:2022.



IEC 62453-71

Edition 1.0 2023-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Field device tool (FDT) interface specification –
Part 71: OPC UA Information Model for FDT**

**Spécification des interfaces des outils des dispositifs de terrain (FDT) –
Partie 71: Modèle d'information de l'OPC UA pour outils FDT**

[SIST EN IEC 62453-71:2024](https://standards.iteh.ai/catalog/standards/sist/56cf233b-87bd-4a2e-87e0-dafabbd8f7bc/sist-en-iec-62453-71-2024)

<https://standards.iteh.ai/catalog/standards/sist/56cf233b-87bd-4a2e-87e0-dafabbd8f7bc/sist-en-iec-62453-71-2024>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 25.040

ISBN 978-2-8322-7619-8

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	7
INTRODUCTION.....	9
0.1 General.....	9
0.2 Presentation of FDT.....	9
0.3 Presentation of OPC Unified Architecture.....	9
0.4 Presentation of OPC UA Device Integration.....	10
1 Scope.....	12
2 Normative references.....	12
3 Terms, definitions and abbreviated terms.....	12
3.1 Terms and definitions.....	12
3.2 Abbreviated terms.....	13
4 Conventions used in this document.....	13
4.1.1 Document conventions.....	13
4.1.2 Conventions for FDT methods.....	13
4.1.3 Conventions for Node descriptions.....	13
4.1.4 NodeIds and BrowseNames.....	16
4.1.5 Common Attributes.....	17
4.1.6 Graphical notation.....	19
5 Concept.....	20
5.1 System architecture.....	20
6 FDT specific OPC UA ObjectTypes.....	21
6.1 General.....	21
6.2 FdtDeviceType.....	21
6.3 FdtFunctionalGroupType.....	23
6.4 IFdtDeviceHealthType interface.....	23
6.5 IFdtSupportInfoType interface.....	23
6.5.1 Overview.....	23
6.6 Document types.....	24
6.6.1 FdtDocumentType.....	24
6.6.2 FdtDocumentFile.....	24
6.6.3 FdtDocumentUrl.....	25
6.7 FdtProtocolType.....	25
6.8 FdtTransferServiceType.....	26
6.9 FdtIoSignalInfoType.....	26
7 OPC UA EventTypes.....	27
7.1 Overview.....	27
7.2 FdtAuditEventType.....	28
7.3 FdtStartMethodEventType.....	28
7.4 FdtEndMethodEventType.....	28
7.5 FdtAuditWriteUpdateEventType.....	29
8 OPC UA VariableTypes.....	29
8.1 FdtParameter.....	29
9 OPC UA DataTypes.....	31
9.1 DataRefType.....	31
9.2 FdtDeviceClassificationType.....	31
9.3 SemanticInfoType.....	32

9.4	Enumeration datatypes	32
9.4.1	AlarmType	32
9.4.2	ApplicationIdEnumeration	33
9.4.3	ClassificationDomainId	33
9.4.4	ClassificationId	34
9.4.5	DocumentClassification	36
9.4.6	FunctionExecutionResultState	36
9.4.7	IECDatatype	37
9.4.8	RangeType	38
9.4.9	SignalTypeEnumeration	38
9.4.10	SubstitutionType	38
9.4.11	SupportedTransfer	39
10	OPC UA ReferenceTypes – HasIOSignalRef	39
11	Mapping of DataTypes	40
11.1	Primitive data types – DeviceHealthEnumeration	40
11.2	Mapping to OPC DI types	40
11.2.1	Device type	40
11.2.2	TopologyElementType	45
11.2.3	FunctionalGroupType	46
11.2.4	Identification FunctionalGroup	47
11.2.5	Device data and device methods	48
11.2.6	Methods	49
11.2.7	Variable	52
11.2.8	Device support information	54
11.2.9	FdtProtocolType	56
12	Profiles and Conformance Units	56
12.1	Conformance Units	56
12.2	Profiles	57
12.2.1	Profile list	57
12.2.2	Server Facets	57
12.2.3	Client Facets	58
13	Namespaces	59
13.1	Namespace metadata	59
13.2	Handling of OPC UA namespaces	60
Annex A (normative) FDT namespace and identifiers		61
Annex B (informative) Use cases		62
B.1	General	62
B.2	Use case: List topology	62
B.3	Use case: Identify device	63
B.4	Get list of available device parameters	64
B.4.1	Use case: Browse device parameters	64
B.4.2	Use case: Get attributes of a device parameter	65
B.5	Use case: Get Device Status	66
B.6	Use case: Get Device Diagnostics	67
B.7	Read parameters	68
B.7.1	Use case: Read offline data	68
B.7.2	Use case: Read online data	69
B.8	Use case: Write device parameters	70

B.9 Use case: Audit trail.....	71
Bibliography.....	72
Figure 1 – OPC UA Devices Example	11
Figure 2 – The OPC UA Information Model Notation	19
Figure 3 – System architecture according to IEC 62453-42	21
Figure 4 – FdtDeviceType overview	22
Figure 5 – FdtProtocolType overview	25
Figure 6 – FdtTransferServiceType overview	26
Figure 7 – FdtIoSignalInfoType overview	27
Figure 8 – Audit event type overview	28
Figure 9 – Example for sources of DeviceType information	41
Figure 10 – Example for sources of TopologyType information	45
Figure 11 – Example for mapping of data and function information	49
Figure 12 – Example for source of function information	50
Figure 13 – Example for source of static function information	51
Table 1 – Examples of DataTypes.....	14
Table 2 – Example for type definition	15
Table 3 – Examples of other characteristics.....	15
Table 4 – <some>Type Additional References	15
Table 5 – <some>Type Additional sub-components	16
Table 6 – <some>Type Attribute values for child Nodes.....	16
Table 7 – Common Node Attributes	17
Table 8 – Common Object Attributes.....	18
Table 9 – Common Variable Attributes.....	18
Table 10 – Common VariableType Attributes	18
Table 11 – Common Method Attributes	19
Table 12 – FdtDeviceType definition	22
Table 13 – FdtFunctionalGroupType definition	23
Table 14 – IFdtDeviceHealthType definition.....	23
Table 15 – IFdtSupportInfoType definition.....	24
Table 16 – IFdtSupportInfoType additional subcomponents	24
Table 17 – FdtDocumentType definition	24
Table 18 – FdtDocumentFile definition	25
Table 19 – FdtDocumentUrl definition	25
Table 20 – FdtProtocolType definition.....	26
Table 21 – FdtTransferServiceType definition	26
Table 22 – FdtIoSignalInfoType definition	27
Table 23 – FdtAuditEventType definition	28
Table 24 – FdtStartMethodEventType definition	28
Table 25 – FdtEndMethodEventType definition	29
Table 26 – FdtAuditWriteUpdateEventType definition.....	29

Table 27 – FdtParameter definition	30
Table 28 – DataRefType structure	31
Table 29 – DataRefType definition	31
Table 30 – FdtDeviceClassificationType structure	31
Table 31 – FdtDeviceClassificationType definition	32
Table 32 – SemanticInfoType structure	32
Table 33 – SemanticInfoType definition	32
Table 34 – AlarmType items	32
Table 35 – AlarmType definition.....	33
Table 36 – ApplicationIdEnumeration items	33
Table 37 – ApplicationIdEnumeration definition.....	33
Table 38 – ClassificationDomainId items.....	34
Table 39 – ClassificationDomainId definition.....	34
Table 40 – ClassificationId items	34
Table 41 – ClassificationId definition.....	36
Table 42 – DocumentClassification items.....	36
Table 43 – DocumentClassification definition.....	36
Table 44 – FunctionExecutionResultState items.....	36
Table 45 – FunctionExecutionResultState definition.....	37
Table 46 – IECDatatype items	37
Table 47 – IECDatatype definition.....	37
Table 48 – RangeType items	38
Table 49 – RangeType definition.....	38
Table 50 – SignalTypeEnumeration items	38
Table 51 – SignalTypeEnumeration definition	38
Table 52 – SubstitutionType items	39
Table 53 – SubstitutionType definition	39
Table 54 – SupportedTransfer items	39
Table 55 – SupportedTransfer definition	39
Table 56 – HasIOSignalRef definition	40
Table 57 – Mapping for DeviceHealthEnumeration	40
Table 58 – DeviceType mapping	42
Table 59 – Device information mapping	43
Table 60 – Offline device parameter mapping	44
Table 61 – Online device parameter mapping	44
Table 62 – TopologyElementType mapping.....	46
Table 63 – FunctionalGroupType mapping.....	47
Table 64 – Mapping for FunctionalGroup Identification.....	47
Table 65 – Method node information mapping.....	50
Table 66 – Method node information mapping for static function	51
Table 67 – TransferService mapping.....	52
Table 68 – Mapping of FDT data items.....	52
Table 69 – FdtParameter mapping	53

Table 70 – Mapping of simple data types	54
Table 71 – Device Type Image mapping	55
Table 72 – ProtocolSupport mapping	55
Table 73 – FdtloSignallInfoType node information mapping	56
Table 74 – FdtProtocolType node information mapping	56
Table 75 – Conformance Units for FDT	57
Table 76 – Profile URIs for FDT	57
Table 77 – FDT Base Server Profile	58
Table 78 – FDT General Server Facet	58
Table 79 – FDT General Client Facet	59
Table 80 – NamespaceMetadata Object for this document	59
Table 81 – Namespaces used in a FDT Server	60
Table 82 – Namespaces used in this document	60

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[SIST EN IEC 62453-71:2024](https://standards.iteh.ai/catalog/standards/sist/56cf233b-87bd-4a2e-87e0-dafabbd8f7be/sist-en-iec-62453-71-2024)

<https://standards.iteh.ai/catalog/standards/sist/56cf233b-87bd-4a2e-87e0-dafabbd8f7be/sist-en-iec-62453-71-2024>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIELD DEVICE TOOL (FDT) INTERFACE SPECIFICATION –

Part 71: OPC UA Information Model for FDT

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) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 62453-71 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation. It is an International Standard.

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

Draft	Report on voting
65E/806/CDV	65E/897A/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/standardsdev/publications.

A list of all parts in the IEC 62453 series, published under the general title *Field device tool (FDT) interface specification*, 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

- reconfirmed,
- withdrawn, or
- revised.

IMPORTANT – The "colour inside" logo on the cover page of this document 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.

iTeh Standards (<https://standards.iteh.ai>) Document Preview

[SIST EN IEC 62453-71:2024](https://standards.iteh.ai/catalog/standards/sist/56cf233b-87bd-4a2e-87e0-dafabbd8f7be/sist-en-iec-62453-71-2024)

<https://standards.iteh.ai/catalog/standards/sist/56cf233b-87bd-4a2e-87e0-dafabbd8f7be/sist-en-iec-62453-71-2024>