

INTERNATIONAL STANDARD



Field device integration (FDI®) –
Part 2: Client

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

[IEC 62769-2:2023](#)

<https://standards.iteh.ai/catalog/standards/iec/48917252-4576-41b8-b403-48c8a908b941/iec-62769-2-2023>



THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2023 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

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

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

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

International Standards
Document Preview
standards.iteh.ai

[IEC 62769-2:2023](http://iec.62769-2-2023)

<https://standards.iteh.ai/catalog/standards/iec/48917252-4576-41b8-b403-48c8a908b941/iec-62769-2-2023>



IEC 62769-2

Edition 3.0 2023-04
REDLINE VERSION

INTERNATIONAL STANDARD



Field device integration (FDI®) –
Part 2: Client

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

[IEC 62769-2:2023](https://standards.iteh.ai/catalog/standards/iec/48917252-4576-41b8-b403-48c8a908b941/iec-62769-2-2023)

<https://standards.iteh.ai/catalog/standards/iec/48917252-4576-41b8-b403-48c8a908b941/iec-62769-2-2023>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 25.040.40; 35.100.05

ISBN 978-2-8322-6803-2

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	10
INTRODUCTION.....	10
1 Scope.....	13
2 Normative references	13
3 Terms, definitions, abbreviated terms, acronyms and conventions.....	14
3.1 Terms and definitions.....	14
3.1.1 Terms used for Services	15
3.1.2 Terms used for Device Access Services	15
3.2 Abbreviated terms and acronyms	16
3.3 Conventions.....	16
4 Overview	16
5 FDI® Client	17
5.1 Device Access Services	17
5.1.1 General	17
5.1.2 Device Model.....	18
5.1.3 Node model	19
5.1.4 Services	25
5.1.5 Base Property Services	30
5.1.6 Device Model Services	31
5.1.7 Locking Services	43
5.1.8 Direct Access Services.....	45
5.1.9 Data types.....	48
5.2 Hosting Services.....	53
5.2.1 General	53
5.2.2 Services	53
5.2.3 Parameter type definitions	66
6 UIP	68
6.1 UIP Services	68
6.1.1 Services	68
6.1.2 Parameter type definitions	72
6.2 UIP instantiation rules.....	73
6.3 UIP state machine.....	74
6.3.1 States.....	74
6.3.2 State transitions	74
6.4 UIP permissions and restrictions.....	75
6.4.1 Introduction Overview.....	75
6.4.2 Access to local file system.....	75
6.4.3 Export / Import of files	75
6.4.4 Inter-Process Communication (IPC).....	76
6.4.5 Open files based on MIME Type	76
6.4.6 Access to ressources.....	76
6.5 UIP deployment	76
6.5.1 UIP downloads from FDI® Server	76
6.5.2 UIP management on FDI® Client.....	78
7 Actions	78
7.1 General.....	78

<https://standards.iteh.ai/>
 IEC 62769-2:2023
<https://standards.iteh.ai/catalog/standards/sic/48917252-4576-41b8-b403-48c8a9086941/iec-62769-2-2023>

7.2	Sequence diagram	79
7.3	FDI® Action schema definition	81
7.4	Interactive transfer to device	82
8	User Interface Description (UID)	83
8.1	Overview	83
8.2	UID execution	86
Annex A (normative)	XML schema	89
A.1	General	89
A.2	AbortRequestT	89
A.3	AccessT	89
A.4	AcknowledgementRequestT	90
A.5	ActionListT	90
A.6	AbortingNotificationT	91
A.7	ActionRequestT	91
A.8	ActionResponseT	92
A.9	ActionT	93
A.10	AxisListT	94
A.11	AxisT	94
A.12	BitEnumerationItemListT	95
A.13	BitEnumerationItemT	96
A.14	ButtonListT	96
A.15	ChartT	96
A.16	ChartTypeT	97
A.17	ColorNameT	98
A.18	ColorT	99
A.19	ColorValueT	99
A.20	ColumnBreakT	99
A.21	DateTimeDataT	100
A.22	DelayMessageRequestT	100
A.23	DiagramLineT	101
A.24	EnumerationItemListT	102
A.25	EnumerationItemT	102
A.26	FormatSpecifierT	103
A.27	GraphT	103
A.28	GridT	104
A.29	HandlingT	104
A.30	ImageT	105
A.31	InfoRequestT	106
A.32	InputRequestT	106
A.33	InputResponseT	107
A.34	InputValueT	107
A.35	InputValueTypeT	108
A.36	LabelHelpT	108
A.37	LabelT	109
A.38	LineTypeT	109
A.39	ListOfActionArgumentsT	110
A.40	MenuT	111
A.41	MenuReferenceT	112
A.42	MenuStyleT	113

A.43	NumericDataT	113
A.44	NumericTemplateT	114
A.45	OptionListT	115
A.46	OrientationT	115
A.47	ParameterInputRequestT	115
A.48	ParameterListT	116
A.49	ParameterT	116
A.50	PluginT	118
A.51	RangeListT	119
A.52	RangeT	119
A.53	ResponseT	120
A.54	RowBreakT	120
A.55	ScalingT	120
A.56	SelectionRequestT	121
A.57	SelectionResponseT	121
A.58	SeparatorT	122
A.59	SizeT	122
A.60	ParameterClassT	122
A.61	ActionClassT	125
A.62	SourceListT	126
A.63	SourceT	127
A.64	StringDataT	127
A.65	StringTemplateT	128
A.66	StringOptionListT	128
A.67	StringOptionT	129
A.68	StringT	129
A.69	TimeScaleT	130
A.70	UidLayoutInformation	130
A.71	UidRequestT	131
A.72	UidResponseT	131
A.73	UiElementSizeableT	132
A.74	UiElementT	132
A.75	UiTemplateT	133
A.76	VariantT	134
A.77	VariantOptionListT	135
A.78	VariantOptionT	135
A.79	VectorListT	136
A.80	VectorT	136
A.81	WaveformListT	137
A.82	WaveformT	137
A.83	WaveformTypeT	138
A.84	WaveformTypeHorizontalT	138
A.85	WaveformTypeVerticalT	138
A.86	WaveformTypeYTT	139
A.87	WaveformTypeXYT	140
A.88	WaveformKeyPointListT	141
A.89	WaveformVectorT	141
A.90	WaveformVectorElementListT	142
A.91	WaveformVectorElementT	142

iteh Standards

<https://standards.iteh.ai/>

Document Preview

IEC 62769-2:2023

<https://standards.iteh.ai/catalog/standards/iec/62769-2/2023-11/62769-2-2023-11-15-4683-4688-90889-11-15-62769-2-2023>

Annex B (informative) Action example.....	144
Annex C (informative) Typical FDI® Client use cases	155
C.1 General.....	155
C.2 Bulk operations	155
C.3 Progress bar support	155
Bibliography.....	157
Figure 1 – FDI® architecture diagram	13
Figure 2 – Overall structure of a Device	18
Figure 3 – Structure of Blocks.....	19
Figure 4 – Device Model NodeClasses.....	19
Figure 5 – Example: Variable hierarchy representing a RECORD.....	23
Figure 6 – Variable hierarchy representing a VALUE_ARRAY of RECORDs.....	24
Figure 7 – UIP state machine.....	74
Figure 8 – FDI® Action sequence diagram.....	80
Figure 9 – Sequence diagram interactive transfer to device	83
Figure 10 – User Interface Descriptions	85
Figure 11 – User Interface Description sequence diagram	87
Figure B.1 – Action example (step 1)	149
Figure B.2 – Action example (step 2)	150
Figure B.3 – Action example (step 3)	151
Figure B.4 – Action example (step 4)	152
Figure B.5 – Action example (step 5)	153
Figure B.6 – Action example (step 6)	154
Figure C.1 – Progress bar support	156
Table 1 – BaseNodeClass Attributes.....	20
Table 2 – Object NodeClass Attributes.....	20
Table 3 – Variable NodeClass Attributes	21
Table 4 – Parsing of the initial bytes	22
Table 4 – Service Definition Table	25
Table 6 – StatusCode Bit Assignments	26
Table 7 – DataValue InfoBits	27
Table 9 – Operation level result codes	28
Table 5 – Service result codes	28
Table 6 – GetDeviceAccessInterfaceVersion Service parameters.....	30
Table 7 – GetOnlineAccessAvailability Service parameters.....	31
Table 8 – Browse Service parameters.....	32
Table 9 – CancelBrowse Service parameters	32
Table 10 – Read Service parameters	33
Table 11 – Read Service result codes.....	33
Table 12 – Read operation result codes.....	34
Table 13 – CancelRead Service parameters	35

Table 14 – Write Service parameters	36
Table 15 – Write operation result codes	36
Table 16 – CancelWrite Service parameters	37
Table 17 – CreateSubscription Service parameters	38
Table 18 – CreateSubscription Service result codes	38
Table 19 – Subscribe Service parameters	39
Table 20 – Subscribe operation result codes	41
Table 21 – Unsubscribe Service Parameters	41
Table 22 – Unsubscribe operation result codes	41
Table 23 – DeleteSubscription Service parameters	42
Table 24 – DataChangeCallback Service parameters	43
Table 25 – DataChangeCallback result codes	43
Table 26 – InitLock Service parameters	44
Table 27 – InitLock Service result codes	44
Table 28 – ExitLock Service parameters	45
Table 29 – ExitLock Service result codes	45
Table 30 – InitDirectAccess Service parameters	46
Table 31 – InitDirectAccess Service result codes	46
Table 32 – ExitDirectAccess Service parameters	47
Table 33 – ExitDirectAccess Service result codes	47
Table 34 – Transfer Service parameters	47
Table 35 – Transfer Service result codes	48
Table 36 – Base data types	48
Table 37 – Identifiers assigned to Attributes	49
Table 38 – NodeSpecifier	49
Table 39 – DataValue	50
Table 40 – InnerErrorInfo	51
Table 41 – LocalizedText Definition	51
Table 42 – LocaleId Examples	52
Table 43 – Range Data Type Structure	52
Table 44 – EUInformation Data Type Structure	53
Table 45 – EnumValueType Definition	53
Table 46 – GetClientTechnologyVersion Service parameters	54
Table 47 – OpenUserInterface Service parameters	54
Table 48 – CloseUserInterface Service parameters	55
Table 49 – LogAuditTrailMessage Service parameters	55
Table 50 – SaveUserSettings Service parameters	56
Table 51 – LoadUserSettings Service parameters	56
Table 52 – Trace Service parameters	57
Table 53 – ShowMessageBox Service parameters	57
Table 54 – ShowProgressBar Service parameters	58
Table 55 – UpdateShowProgressBar Service parameters	58
Table 56 – EndShowProgressBar Service parameters	59

<https://standards.itec.ai/> <https://standards.itec.ai/standards/iec/48917252-4576-41b8-b403-48c8a908b941/iec-62769-2023>

Table 57 – StandardUIActionItemsChange Service parameters.....	59
Table 58 – SpecificUIActionItemsChange Service parameters	60
Table 59 – InitExportFile Service parameters.....	61
Table 60 – WriteExportFile Service parameters	61
Table 61 – FinishExportFile Service parameters	62
Table 62 – InitImportFile Service parameters.....	62
Table 63 – ReadImportFile Service parameters.....	63
Table 64 – FinishImportFile Service parameters	63
Table 65 – InitOpenDefaultApplication Service parameters	64
Table 66 – WriteOpenDefaultApplication Service parameters.....	64
Table 67 – FinishOpenDefaultApplication Service parameters	65
Table 68 – GetHostingProperties Service parameters	65
Table 69 – GetHostingProperties Key Value Pairs	66
Table 70 – DefaultResult definition	67
Table 71 – ButtonSet definition	67
Table 72 – AcknStyle definition.....	67
Table 73 – Activate Service parameters.....	68
Table 74 – Deactivate Service parameters.....	69
Table 75 – SetSystemLabel Service parameters	70
Table 76 – SetTraceLevel Service parameters	70
Table 77 – GetStandardUIActionItems Service parameters	70
Table 78 – GetSpecificUIActionItems Service parameters.....	71
Table 79 – InvokeStandardUIAction Service parameters.....	71
Table 80 – InvokeSpecificUIAction Service parameters.....	72
Table 81 – TraceLevel definition	72
Table 82 – StandardUIAction definition	73
Table 83 – StandardUIActionItem definition	73
Table 84 – SpecificUIActionItem definition	73
Table 85 – UIP states	74
Table 86 – UIP state transitions	75
Table A.1 – Elements of AbortRequestT	89
Table A.2 – Enumerations of AccessT.....	90
Table A.3 – Elements of AcknowledgementRequestT.....	90
Table A.4 – Elements of ActionListT	90
Table A.5 – Elements of ActionRequestT	92
Table A.6 – Elements of ActionResponseT	93
Table A.7 – Elements of ActionT.....	94
Table A.8 – Elements of AxisListT	94
Table A.9 – Attributes of AxisT.....	95
Table A.10 – Elements of AxisT	95
Table A.11 – Elements of BitEnumerationItemListT.....	95
Table A.12 – Elements of BitEnumerationItemT	96
Table A.13 – Elements of ButtonListT	96

Table A.14 – Elements of ChartT	97
Table A.15 – Enumerations of ChartTypeT	98
Table A.16 – Enumerations of ColorNameT	99
Table A.17 – Enumerations of DateTimeDataT	100
Table A.18 – Elements of DelayMessageRequestT	101
Table A.19 – Attributes of DiagramLineT	101
Table A.20 – Elements of DiagramLineT	102
Table A.21 – Elements of EnumerationItemListT	102
Table A.22 – Elements of EnumerationItemT	103
Table A.23 – Elements of GraphT	104
Table A.24 – Elements of GridT	104
Table A.25 – Enumerations of HandlingT	105
Table A.26 – Attributes of ImageT	106
Table A.27 – Elements of ImageT	106
Table A.28 – Elements of InfoRequestT	106
Table A.29 – Elements of InputRequestT	107
Table A.30 – Elements of InputResponseT	107
Table A.31 – Elements of InputValueT	108
Table A.32 – Elements of InputValueTypeT	108
Table A.33 – Elements of LabelHelpT	109
Table A.34 – Elements of LabelT	109
Table A.35 – Enumerations of LineTypeT	110
Table A.36 – Attributes of MenuT	112
Table A.37 – Elements of MenuT	112
Table A.38 – Attributes of MenuReferenceT	112
Table A.39 – Elements of MenuReferenceT	113
Table A.40 – Enumerations of MenuStyleT	113
Table A.41 – Enumerations of NumericDataT	114
Table A.42 – Elements of NumericTemplateT	114
Table A.43 – Elements of OptionListT	115
Table A.44 – Enumerations of OrientationT	115
Table A.45 – Elements of ParameterInputRequestT	116
Table A.46 – Elements of ParameterListT	116
Table A.47 – Elements of ParameterT	118
Table A.48 – Elements of PluginT	119
Table A.49 – Elements of RangeListT	119
Table A.50 – Elements of RangeT	120
Table A.51 – Enumerations of ScalingT	121
Table A.52 – Elements of SelectionRequestT	121
Table A.53 – Elements of SelectionResponseT	122
Table A.54 – Enumerations of SizeT	122
Table A.55 – Enumerations of ParameterClassT	124
Table A.56 – Enumerations of ActionClassT	126

Table A.57 – Elements of SourceListT	127
Table A.58 – Elements of SourceT	127
Table A.59 – Enumerations of StringDataT	128
Table A.60 – Elements of StringTemplateT	128
Table A.61 – Elements of StringOptionListT	129
Table A.62 – Elements of StringOptionT	129
Table A.63 – Elements of StringT	130
Table A.64 – Enumerations of TimeScaleT	130
Table A.65 – Elements of UidLayoutInformation	131
Table A.66 – Elements of UidRequestT	131
Table A.67 – Elements of UidResponseT	132
Table A.68 – Attributes of UiElementSizeableT	132
Table A.69 – Elements of UiElementSizeableT	132
Table A.70 – Elements of UiElementT	133
Table A.71 – Elements of UiTemplateT	134
Table A.72 – Elements of VariantT	135
Table A.73 – Elements of VariantOptionListT	135
Table A.74 – Elements of VariantOptionT	136
Table A.75 – Elements of VectorListT	136
Table A.76 – Elements of VectorT	137
Table A.77 – Elements of WaveformListT	137
Table A.78 – Elements of WaveformT	138
Table A.79 – Elements of WaveformTypeHorizontalT	138
Table A.80 – Elements of WaveformTypeVerticalT	139
Table A.81 – Elements of WaveformTypeYTT	140
Table A.82 – Elements of WaveformTypeXYT	140
Table A.83 – Elements of WaveformKeyPointListT	141
Table A.84 – Attributes of WaveformVectorT	142
Table A.85 – Elements of WaveformVectorT	142
Table A.86 – Elements of WaveformVectorElementListT	142
Table A.87 – Elements of WaveformVectorElementT	143

INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIELD DEVICE INTEGRATION (FDI®) –

Part 2: Client

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.

This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 62769-2:2021. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 62769-2 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.

This third edition cancels and replaces the second edition published in 2021. This edition constitutes a technical revision.

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

- a) added interactive transfer to device;
- b) corrected ListOfInputArguments.

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

Draft	Report on voting
65E/855/CDV	65E/912/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 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.

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.

INTRODUCTION

The IEC 62769 series has the general title *Field Device Integration (FDI)* and the following parts:

- Part 1: Overview
- Part 2: FDI Client
- Part 3: FDI Server
- Part 4: FDI Packages
- Part 5: FDI Information Model
- Part 6: FDI Technology Mapping
- Part 7: FDI Communication Devices
- Part 100: Profiles — Generic Protocol Extensions
- Part 101-1: Profiles — Foundation Fieldbus H1
- Part 101-2: Profiles — Foundation Fieldbus HSE
- Part 103-1: Profiles — PROFIBUS
- Part 103-4: Profiles — PROFINET
- Part 109-1: Profiles — HART and WirelessHART
- Part 115-2: Profiles — Protocol-specific Definitions for Modbus RTU
- Part 150-1: Profiles — ISA 100.11a

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

[IEC 62769-2:2023](https://standards.iteh.ai/catalog/standards/iec/48917252-4576-41b8-b403-48c8a908b941/iec-62769-2-2023)

<https://standards.iteh.ai/catalog/standards/iec/48917252-4576-41b8-b403-48c8a908b941/iec-62769-2-2023>