



SLOVENSKI STANDARD
oSIST prEN IEC 62769-102-2:2022
01-maj-2022

Integracija procesne naprave (FDI) - 102-2. del: Profili - EtherNet/IP

Field device integration (FDI) - Part 102-2: Profiles - EtherNet/IP

**iTeh STANDARD
PREVIEW**

Ta slovenski standard je istoveten z: **prEN IEC 62769-102-2:2022**
(standards.iteh.ai)

| | | |
|--|---|--|
| ICS: | https://standards.iteh.ai/catalog/standards/sist/c97e7f8c-d3b5-4925-a410-8e27fd506336/osist-pren-iec-62769-102-2-2022 | |
| 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 62769-102-2:2022 | | en,fr,de |

**iTeh STANDARD
PREVIEW
(standards.iteh.ai)**

oSIST prEN IEC 62769-102-2:2022
<https://standards.iteh.ai/catalog/standards/sist/c97e7f8c-d3b5-4925-a410-8e27fd506336/osist-pren-iec-62769-102-2-2022>



65E/852/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:

IEC 62769-102-2 ED1

DATE OF CIRCULATION:

2022-03-04

CLOSING DATE FOR VOTING:

2022-05-27

SUPERSEDES DOCUMENTS:

65E/792/NP, 65E/837A/RVN

| | |
|---|---|
| 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: SC 65C | PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary. |
| FUNCTIONS CONCERNED: <input type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY | |
| <input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING | <input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING |
| <p>Attention IEC-CENELEC parallel voting</p> <p>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.</p> <p>The CENELEC members are invited to vote through the CENELEC online voting system.</p> | |

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 102-2: Profiles - EtherNet/IP

PROPOSED STABILITY DATE: 2025

NOTE FROM TC/SC OFFICERS:

**iTeh STANDARD
PREVIEW
(standards.iteh.ai)**

[oSIST prEN IEC 62769-102-2:2022](https://standards.iteh.ai/catalog/standards/sist/c97e7f8c-d3b5-4925-a410-8e27fd506336/osist-pren-iec-62769-102-2-2022)
[https://standards.iteh.ai/catalog/standards/sist/c97e7f8c-
d3b5-4925-a410-8e27fd506336/osist-pren-iec-62769-
102-2-2022](https://standards.iteh.ai/catalog/standards/sist/c97e7f8c-d3b5-4925-a410-8e27fd506336/osist-pren-iec-62769-102-2-2022)

CONTENTS

| | | |
|----|---|----|
| 1 | | |
| 2 | | |
| 3 | FOREWORD | 4 |
| 4 | 1 Scope | 6 |
| 5 | 2 Normative References | 6 |
| 6 | 3 Terms, definitions, abbreviated terms and Acronyms | 6 |
| 7 | 3.1 Terms and definitions | 6 |
| 8 | 3.2 Abbreviations | 6 |
| 9 | 4 Conventions | 7 |
| 10 | 4.1 EDDL syntax | 7 |
| 11 | 4.2 Capitalizations | 7 |
| 12 | 5 PSDs for EtherNet/IP | 7 |
| 13 | 5.1 General | 7 |
| 14 | 5.2 Header | 7 |
| 15 | 5.3 ProtocolIdentifier | 9 |
| 16 | 5.4 Address | 9 |
| 17 | 5.5 Manufacturer | 10 |
| 18 | 5.6 DeviceModel | 10 |
| 19 | 5.7 DeviceRevision | 10 |
| 20 | 5.8 SerialNumber | 10 |
| 21 | 5.9 Tag | 10 |
| 22 | 5.10 ProfileId | 10 |
| 23 | 5.11 Version | 10 |
| 24 | 5.12 ProtocolSupportFile | 10 |
| 25 | 5.13 ExtendedDeviceRevision | 11 |
| 26 | 6 Byte Ordering | 11 |
| 27 | 7 Error Codes | 11 |
| 28 | 8 Example of EtherNet/IP | 11 |
| 29 | 8.1 Called functionality (success) | 11 |
| 30 | 8.2 Called Functionality (Error) | 12 |
| 31 | 8.3 EDD Command | 12 |
| 32 | 9 Scanning | 13 |
| 33 | Bibliography | 14 |
| 34 | | |
| 35 | Table 1 EtherNet/IP Functions and their representation in an EDD HEADER | 8 |
| 36 | Table 2 - EDD datatype mapping with CIP datatype | 9 |
| 37 | Table 3 - ProtocolSupportFile for FDI Device Packages | 10 |
| 38 | Table 4 - Example EtherNet/IP PDU | 11 |
| 39 | Table 5 - Example EtherNet/IP PDU with Error Response | 12 |
| 40 | | |

iTech STANDARD
PREVIEW
(standards.iteh.ai)

[oSIST prEN IEC 62769-102-2:2022](https://standards.iteh.ai/catalog/standards/sist/c97e7f8c-1015-4935-a410-8e27fd506336/osist-pren-iec-62769-102-2-2022)

<https://standards.iteh.ai/catalog/standards/sist/c97e7f8c-1015-4935-a410-8e27fd506336/osist-pren-iec-62769-102-2-2022>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIELD DEVICE INTEGRATION (FDI) –

Part 102-2: Profiles – EtherNet/IP

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.

IEC 662769-102-2 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.

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

| | |
|------------|------------------|
| Draft | Report on voting |
| XX/XX/FDIS | XX/XX/RVD |

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.

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

91 The committee has decided that the contents of this document will remain unchanged until the stability
92 date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific
93 document. At this date, the document will be

- 94 • reconfirmed,
- 95 • withdrawn,
- 96 • replaced by a revised edition, or
- 97 • amended.

98

iTeh STANDARD PREVIEW (standards.iteh.ai)

[oSIST prEN IEC 62769-102-2:2022](https://standards.iteh.ai/catalog/standards/sist/c97e7f8c-d3b5-4925-a410-8e27fd506336/osist-pren-iec-62769-102-2-2022)
[https://standards.iteh.ai/catalog/standards/sist/c97e7f8c-
d3b5-4925-a410-8e27fd506336/osist-pren-iec-62769-
102-2-2022](https://standards.iteh.ai/catalog/standards/sist/c97e7f8c-d3b5-4925-a410-8e27fd506336/osist-pren-iec-62769-102-2-2022)

FIELD DEVICE INTEGRATION (FDI) –

Part 102-2: Profiles – EtherNet/IP

99
100
101
102
103
104

105 **1 Scope**

106 This document defines the protocol-specific definitions (PSDs) as defined in IEC 62769-100 (annex on
107 generic protocol extensions) for the Ethernet/IP protocol.

108 **2 Normative References**

109 The following documents, in whole or in part, are normatively referenced in this document and are
110 indispensable for its application. For dated references, only the edition cited applies. For undated
111 references, the latest edition of the referenced document (including any amendments) applies.

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

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

115 IEC 62769-4:2022, *Field Device Integration (FDI) – Part 4: FDI Packages*

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

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

118 IEC 62769-100, *Field Device Integration (FDI) – Part 100: Profiles – Generic Protocols*

119 CIP01, ODVA.org: Volume One: Common Industrial Protocol (CIP™)-Edition 3.27

120 CIP02, ODVA.org: Volume Two: EtherNet/IP Adaptation of CIP-Edition 1.25

121 IETF RFC 1117 – Internet Numbers, August, 1989

122 **3 Terms, definitions, abbreviated terms and Acronyms**

123 **3.1 Terms and definitions**

124 For the purposes of this document, the terms and definitions are given in IEC 61784-1, IEC 61804 (all
125 parts), IEC 62541-100, IEC 62769-4, IEC 62769-5, and IEC 62769-7 apply.

126 **3.2 Abbreviations**

127 For the purposes of this specification, the following abbreviations apply.

128 EDD Electronic Device Description

129 EDDL Electronic Device Description Language (see IEC 61804 (all parts))

130 FDI Field Device Integration

131 FCG FieldComm Group

132 XML Extensible markup language (see REC-xml-20081126)

133 EDS Electronic Data Sheet

134 PDU Protocol Data Unit

135 4 Conventions

136 4.1 EDDL syntax

137 This part of IEC 62769 specifies content for the EDD component that is part of FDI Communication
138 Packages. The specification content using EDDL syntax uses the font `Courier New`. The EDDL syntax
139 is used for method signature, variable, data structure and component declarations.

140 4.2 Capitalizations

141 The IEC 62769 series use capitalized terms to emphasize that these terms have a FDI specific meaning.

142 Some of these terms using an acronym as a prefix for example

- 143 • FDI Client, or
- 144 • FDI Server.

145 Some of these terms are compound terms such as:

- 146 • Communication Servers, or
- 147 • Profile Package.

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

- 150 • ProtocolSupportFile or
- 151 • ProtocolType.

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

- 154 • DEVICE_REV or
- 155 • DEVICE_MODEL

156 5 PSDs for EtherNet/IP

157 5.1 General

158 The next sections define the protocol-specific definitions for EtherNet/IP. EtherNet/IP makes use of
159 standard Ethernet and TCP/IP technology to transport CIP communications packets. The result is a
160 common, open application layer on top of open and highly popular Ethernet and TCP/IP protocols (see
161 CIP02). The EtherNet/IP uses the unconnected message which shall utilize the TCP/IP resource to move
162 message across Ethernet.

163 5.2 Header

164 The HEADER string used to define EDD commands contains the information about what EtherNet/IP
165 service is called and what object, instance and attribute are addressed by the service. It shall contain the
166 attribute SERVICE_CODE and may, depending on the SERVICE_CODE, contain the attribute CLASS,
167 INSTANCE, ATTRIBUTE and DatatypeMappings. The syntax is <attribute> = “<value>” per attribute,
168 attributes are separated by a space. The value is provided as hexadecimal value, not as a decimal value.

169 For example, to read the number of objects supported by the device Service Get_Attribute_Single (0x0E)
 170 to the Message Router Object first instance the HEADER string is "SERVICE_CODE=\\"0E\\"
 171 CLASS=\\"1\\" INSTANCE=\\"1\\" ATTRIBUTE=\\"1\\"".

172 The values for SERVICE_CODE is restricted to hexadecimal values between 0 to FF, the values for CLASS
 173 and ATTRIBUTE are restricted to hexadecimal values between 0 to FFFF and the values for INSTANCE
 174 is restricted to hexadecimal values between 0 to FFFFFFFF (see CIP01).

175 Table 1 specifies the common EtherNet/IP SERVICE_CODE values and the usage of the attributes, as
 176 well as the used EDD COMMAND OPERATION.

177

Table 1 EtherNet/IP Functions and their representation in an EDD HEADER

| Functionality | SERVICE_CODE(Hex) | CLASS(Hex) | INSTANCE(Hex) | ATTRIBUTE(Hex) | Operation (in EDD) | Request (in EDD) | Response (in EDD) |
|----------------------|-------------------|-------------------|---------------|----------------|--------------------|--------------------------------|--------------------------------|
| Get_Attributes_All | 01 | Object Class code | Instance ID | Attribute ID | R | - | Attribute Values |
| Set_Attributes_All | 02 | Object Class code | Instance ID | Attribute ID | W | Attribute Values | - |
| Get_Attribute_Single | 0E | Object Class code | Instance ID | Attribute ID | R | - | Attribute Value |
| Set_Attribute_Single | 10 | Object Class code | Instance ID | Attribute ID | W | Attribute Value | - |
| Generic_Service | Any Service Code | Object Class code | Instance ID | Attribute ID | R/W/C | Object / Service Specific Data | Object / Service Specific Data |

NOTE 1 The table lists the most common four services and what data is provided in the HEADER, REQUEST & RESPONSE parameters of an EDD command. There are several different common services, object specific services and/or vendor-specific services supported by the device. Few examples are Reset, Start, Read/Write Modbus Registers, etc. Any of these services can be accessed through the Generic_Service by specifying the correct service code, object class code, instance ID, attribute ID and Request data as per the EtherNet/IP specification.

NOTE 2 Based on the service, the instance ID and/or attribute ID may not be applicable for all the service. In such case it need mandatory to define the INSTANCE and/or ATTRIBUTE in EDD Header. For example, Get_Attributes_All doesn't need any attribute value so we can defined the EDD header like "SERVICE_CODE=\\"01\\" CLASS=\\"1\\" INSTANCE=\\"1\\"".

¹ NOTE that \ is used as escape character allowing " in the HEADER string.