SLOVENSKI STANDARD
oSIST prEN IEC 62769-109-1:2022

01-maj-2022

Integracija procesne naprave (FDI) - 109-1. del: Profili - HART® in brezžični HART®

Field device integration (FDI) - Part 109-1: Profiles - HART® and WirelessHART®

Intégration des appareils de terrain (FDI) - Partie 109-1: Profils - HART® et WirelessHART®

Ta slovenski standard je istoveten z: prEN IEC 62769-109-1:2022

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 62769-109-1:2022 en,fr,de

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65E/864/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:
IEC 62769-109-1 ED3

DATE OF CIRCULATION:	CLOSING DATE FOR VOTING:
2022-03-04	**2022-05-27**

SUPERSEDES DOCUMENTS:
65E/831/RR

IEC SC 65E : DEVICES AND INTEGRATION IN ENTERPRISE SYSTEMS	
SECRETARIAT:	SECRETARY:
United States of America	Mr Donald (Bob) Lattimer
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TITLE:
Field device integration (FDI) - Part 109-1: Profiles - HART® and WirelessHART®

PROPOSED STABILITY DATE: 2025

65E/864/CDV – 2 – IEC CDV 62769-101-9 © IEC:2022

Note from TC/SC officers:

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90 INTERNATIONAL ELECTROTECHNICAL COMMISSION

91 _____

93 **FIELD DEVICE INTEGRATION (FDI) –**

95 **Part 109-1: Profiles – HART® and WirelessHART®**

97 FOREWORD

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128 IEC 62769-109-1 has been prepared by subcommittee 65E: Devices and integration in enterprise systems,
129 of IEC technical committee 65: Industrial-process measurement, control and automation. It is an
130 International Standard.

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

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

134 a) added content type for DeviceInfo files;

135 b) added mapping from HART standard parameters to PA DIM;

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

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

137

138 Full information on the voting for its approval can be found in the report on voting indicated in the above
139 table.

140 The language used for the development of this International Standard is English.

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

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

148 • reconfirmed,

149 • withdrawn,

150 • replaced by a revised edition, or

151 • amended.

152

153 **FIELD DEVICE INTEGRATION (FDI) –**
154
155 **Part 109-1: Profiles –**
156 **HART® and WirelessHART®**
157
158
159

160 ## 1 Scope

161 This part of IEC 62769 specifies an FDI profile of IEC 62769 for IEC 61784-1_CP 9/1 (HART®)[1] and
162 IEC 61784-1_CP 9/2 (WirelessHART®).

163 ## 2 Normative references

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

167 IEC 62541-100, *OPC Unified Architecture Specification – Part 100: OPC Device Interface*

168 FCG AG21073, HART DeviceInfo – Technical Overview; to be released

169 IEC 62769-4, *Field device integration (FDI) – Part 4: FDI Packages*

170 IEC 62769-5, *Field device integration (FDI) – Part 5: FDI Information Model*

171 IEC 62769-7, *Field device integration (FDI) – Part 7: Communication Devices*

172 ## 3 Terms, definitions, abbreviated terms and acronyms

173 ### 3.1 Terms and definitions

174 For the purposes of this document, the terms and definitions given in IEC 62541-100, IEC 62769-4,
175 IEC 62769-5 and IEC 62769-7 apply.

176 ### 3.2 Abbreviated terms and acronyms

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

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)
EDDL	Electronic device description language (see IEC 61804)
FDI	Field device integration
FSK	Frequency-Shift-Keying
HCF	HART Communication Foundation
ID	Identification
IM	Information Model
IP	Internet protocol
PDU	Protocol data unit
PSK	Phase-Shift-Keying

TCP	Transmission Control Protocol (see IETF RFC 793)	
UDP	User Datagram Protocol (see IETF RFC 768)	
XML	Extended markup language	

178

4 Conventions

4.1 EDDL syntax

181 This document specifies content for the EDD component that is part of FDI Communication Packages.
182 EDDL syntax uses the font `Courier New`. EDDL syntax is used for method signature, variable, data
183 structure and component declarations.

4.2 XML syntax

185 XML syntax examples use font `Courier New`. The XML syntax is used to describe XML document
186 schema.

187 Example: `<xs:simpleType name="ExampleT">`

4.3 Capitalizations

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

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

191 • FDI Client or

192 • FDI Server.

193 Some of these terms are compound terms such as:

194 • FDI Communication Servers or

195 • Profile Package.

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

198 • ProtocolSupportFile or

199 • ProtocolType.

200 Parameter names or attributes can also be constructed by using an underscore character to concatenate
201 two or more terms like:

202 • PROFILE_ID or

203 • HART_Network

5 Profile for CP 9/1 (HART®) or CP 9/2 (WirelessHART®)

5.1 General

206 This profile document to the FDI specification in IEC 62769 selects the protocol specifics needed for FDI
207 Packages describing FDI Communication Servers, gateways and devices.

5.2 Catalog profile

5.2.1 Protocol support file

210 Device information files provide metadata for the dynamic runtime data that is supplied by the device. This
211 metadata is a subset of information that is contained in the EDD. The device information files may be

212 extracted from the package by light-weight gateway or server implementations to exchange runtime device
213 information with minimal implementation overhead. Device information files do not replace the need for
214 the EDD part because device information files only contain a subset of the information from the EDD, and
215 do not provide any user-interface elements.

216 The formats of the Device Information Files are described in Table 1.

217 **Table 1 – Device Information Files**

Part	Content
Content Type	application/vnd.hart.json
Root Namespace	Not specified here
Source Relationship	http://fdi-cooperation.com/2010/relationships/attachment-protocol
Filename	Not specified here

218

219 The Device Information Files are specified in FCG AG21073.

220 **5.2.2   CommunicationProfile definition**

221 IEC 62769-4 defines a CommunicationProfileT string type for the Catalog XML schema. Table 2 defines
222 the CP 9/1 specific values for this enumeration.

223 **Table 2 – CommunicationProfile definition**

CommunicationProfile	Description
hart_fsk	CP 9/1 device type that supports an FSK physical layer (Frequency-Shift-Keying on a pair of wires)
hart_psk	CP 9/1 device type that supports a PSK physical layer (Phase-Shift-Keying on a pair of wires). Devices supporting PSK are required to also inherently support FSK, and therefore PSK will always be used only in combination with at least FSK.
hart_wirelesshart	CP 9/2 device type that supports a wireless physical layer (communication between device and gateway).
hart_ip	CP 9/1 device type that supports Internet Protocol (these devices support both TCP and UDP).
hart_rs485	CP 9/1 device type that supports EIA-485 digital communication.
hart_ir	CP 9/1 device type that supports an Infrared physical layer (designed to be transparent to FSK masters – included only as information to indicate that the device supports IR connection).
NOTE It is possible for a single CP 9/1 device to support more than one CP.	

224

225 **5.2.3   Profile device**

226 A Profile Package shall provide the catalog values for profile devices, enabling the FDI Server to leverage
227 a generic device description, if a specific one is not available. The definitions in Table 3 focus on catalog
228 content that is vendor independent.

229 **Table 3 – Catalog values for profile devices**

Element	Attribute	Content
PackageType	—	Profile

DeviceModel	—	Empty
Manufacturer	—	Empty

230

5.2.4   Protocol version information

231

232 IEC 62769-4 defines an element type named InterfaceT for the Catalog XML Schema. Element type
233 InterfaceT contains an element named Version which is supposed to provide version information about
234 the applied communication protocol profile. The value has to follow the IEC 62769-4 defined version
235 information schema defined in element type VersionT. Subclause 5.2.4 describes how to apply the
236 currently known protocol versions for CP 9/1 or CP 9/2 entries in the device catalog. The general rule is
237 to use the Universal Revision of the protocol for the major version part of VersionT, and the value "0" for
238 the minor version and build parts. Table 4 shows the Protocol Version Information.

239   **Table 4 – Protocol Version Information**

Protocol Version	InterfaceT Version value
HART Universal Revision 5	5.0.0
HART Universal Revision 6	6.0.0
HART Universal Revision 7	7.0.0
The Protocol Version defined in a package is provided for informational purposes only, and shall not be used to determine the compatibility or applicability of a package to a device.	

240

5.3   Associating a Package with a CP 9/1 device

241

5.3.1   Device type identification mapping

242

243 CP 9/1 device types are uniquely identified by parameters Manufacturer, Model and DeviceRevision.
244 These parameters are used to associate a given device instance to an FDI Device Package. These
245 parameters are mapped to the FDI Device Package Catalog according to Table 5.

246   **Table 5 – Device type catalog mapping**

Catalog element	CP mapping (SeeTable A.1)
Manufacturer element of InterfaceT (IEC 62769-4:–, Clause E.11)	Manufacturer String format "0xdddd" where dddd is the MANUFACTURER_ID in hexadecimal format.
DeviceModel element of InterfaceT (IEC 62769-4:–, Clause E.11)	Model String format "0xdddd" where dddd is the DEVICE_TYPE in hexadecimal format.
DeviceRevision element ListOfSupportedDeviceRevisionsT (IEC 62769-4:–, Clause E.21)	DeviceRevision String format "x.0.0" where x is the DEVICE_REVISION in decimal format (no leading zeros).

247

5.3.2   Device type revision mapping

248

249 Each device type is identified as per 5.3.1. If a package with matching DeviceRevision is not available,
250 any CP 9/1 FDI package for a corresponding manufacturer and model shall always be compatible with a
251 field device as long as the device revision of the field device is equal to or greater than the device revision
252 specified in the FDI package.