



**SLOVENSKI STANDARD**  
**oSIST prEN IEC 62453-1:2022**  
**01-maj-2022**

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**Specifikacija vmesnika orodja procesne naprave (FDT) - 1. del: Pregled in vodilo**

Field device tool (FDT) interface specification - Part 1: Overview and guidance

Spécification des interfaces des outils des dispositifs de terrain (FDT) - Partie 1: Vue d'ensemble et guide

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Ta slovenski standard je istoveten z: **prEN IEC 62453-1:2022**

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**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

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# 65E/872/CDV

## COMMITTEE DRAFT FOR VOTE (CDV)

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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><b>Attention IEC-CENELEC parallel voting</b></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>	

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TITLE:

**Field device tool (FDT) interface specification - Part 1: Overview and guidance**

PROPOSED STABILITY DATE: 2025

NOTE FROM TC/SC OFFICERS:

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### FIELD DEVICE TOOL (FDT) INTERFACE SPECIFICATION –

#### Part 1: Overview and guidance

#### 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.
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International Standard IEC 62453-1 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation.

This third edition cancels and replaces the first edition published in 2016. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition: introduction of a new implementation technology (defined in IEC TR 62453-43) as well as an OPC UA information model for FDT (defined in IEC 62453-71).



171 The text of this standard is based on the following documents:

CDV	Report on voting
65E/-/CDV	65E/-/RVC

172  
173 Full information on the voting for the approval of this standard can be found in the report on  
174 voting indicated in the above table.

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

176 A list of all parts of the IEC 62453 series, under the general title *Field Device Tool (FDT)*  
177 *interface specification*, can be found on the IEC website.

178 The committee has decided that the contents of this publication will remain unchanged until  
179 the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data  
180 related to the specific publication. At this date, the publication will be

- 181 • reconfirmed,
- 182 • withdrawn,
- 183 • replaced by a revised edition, or
- 184 • amended.

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## INTRODUCTION

189 Enterprise automation requires two main data flows: a “vertical” data flow from enterprise  
190 level down to the field devices including signals and configuration data, and a “horizontal”  
191 communication between field devices operating on the same or different communication  
192 technologies.

193 With the integration of fieldbuses into control systems, there are a few additional tasks to be  
194 performed. They may result in a large number of fieldbus- and device-specific tools in addition  
195 to system and engineering tools. Integration of these tools into higher-level system-wide  
196 planning or engineering tools is an advantage. In particular, for use in extensive and  
197 heterogeneous control systems, typically in the area of the process industry, the unambiguous  
198 definition of engineering interfaces that are easy to use for all those involved is of great  
199 importance.

200 Several different manufacturer specific tools are used. The data in these tools are often  
201 invisible data islands from the viewpoint of system life-cycle management and plant-wide  
202 automation.

203 To ensure the consistent management of a plant-wide control and automation technology, it is  
204 important to fully integrate fieldbuses, devices and sub-systems as a seamless part of a wide  
205 range of automation tasks covering the whole automation life-cycle.

206 IEC 62453 provides an interface specification for developers of FDT<sup>1</sup> (Field Device Tool)  
207 components to support function control and data access within a client/server architecture.  
208 The availability of this standard interface facilitates development of servers and clients by  
209 multiple manufacturers and supports open interoperation.

210 A device or module-specific software component, called a DTM (Device Type Manager) is  
211 supplied by a manufacturer with the related device type or software entity type. Each DTM  
212 can be integrated into engineering tools via defined FDT interfaces. This approach to  
213 integration is in general open for all fieldbuses and thus supports integration of different  
214 devices and software modules into heterogeneous control systems.

215 The IEC 62453 common application interface supports the interests of application developers,  
216 system integrators, and manufacturers of field devices and network components. It also  
217 simplifies procurement, reduces system costs and helps manage the lifecycle. Significant  
218 savings are available in operating, engineering and maintaining the control systems.

219 The objectives of the IEC 62453 series are to support:

- 220 • universal plant-wide tools for life-cycle management of heterogeneous fieldbus  
221 environments, multi-manufacturer devices, function blocks and modular sub-systems for  
222 all automation domains (e.g. process automation, factory automation and similar  
223 monitoring and control applications);
- 224 • integrated and consistent life-cycle data exchange within a control system including its  
225 fieldbuses, devices, function blocks and modular sub-systems;
- 226 • simple and powerful manufacturer-independent integration of different automation devices,  
227 function blocks and modular sub-systems into the life-cycle management tools of a control  
228 system.

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<sup>1</sup> FDT® is a registered trade name of FDT Group AISBL. This information is given for the convenience of users of this document and does not constitute an endorsement by IEC of the trademark holder or any of its products. Compliance to this document does not require use of the trade name. Use of the trade name requires permission of the trade name holder.

229 The FDT concept supports planning and integration of monitoring and control applications, it  
230 does not provide a solution for other engineering tasks such as "electrical wiring planning",  
231 "mechanical planning". Plant management subjects such as "maintenance planning", "control  
232 optimization", "data archiving", are not part of this FDT standard. Some of these aspects may  
233 be included in future editions of FDT publications.

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## FIELD DEVICE TOOL (FDT) INTERFACE SPECIFICATION –

### Part 1: Overview and guidance

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#### 241 1 Scope

242 This part of IEC 62453 presents an overview and guidance for the IEC 62453 series. It

- 243 • explains the structure and content of the IEC 62453 series (see Clause 5);
- 244 • provides explanations of some aspects of the IEC 62453 series that are common to many
- 245 of the parts of the series;
- 246 • describes the relationship to some other standards.

#### 247 2 Normative references

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

252 IEC 61158 (all parts), *Industrial communication networks – Fieldbus specifications*

253 IEC 61784 (all parts), *Industrial communication networks – Profiles*

#### 254 3 Terms, definitions, symbols, abbreviations and conventions

255 For the purposes of this document the following terms, definitions, abbreviations and  
256 conventions apply.

##### 257 3.1 Terms and definitions

###### 258 3.1.1

###### 259 actor

260 coherent set of roles that users of use cases play when interacting with these use cases

261 Note 1 to entry: An actor has one role for each use case with which it communicates.

262 [SOURCE: ISO/IEC 19501:2005, 4.11.2.1]

###### 263 3.1.2

###### 264 address

265 communication protocol specific access identifier

###### 266 3.1.3

###### 267 application

268 software functional unit that is specific to the solution of a problem in industrial-process  
269 measurement and control

270 Note 1 to entry: An application may be distributed among resources, and may communicate with other  
271 applications.

- 272 **3.1.4**  
 273 **business object**  
 274 object representing specific behavior (e.g. DTM, BTM and channel)
- 275 Note 1 to entry: The term business object has been defined originally as part of the design pattern three-tier  
 276 architecture, where the business object is part of the business layer.
- 277 **3.1.5**  
 278 **Block Type Manager**  
 279 **BTM**  
 280 specialized DTM to manage and handle a block
- 281 Note 1 to entry: This note applies to the French language only.
- 282 **3.1.6**  
 283 **communication**  
 284 fieldbus protocol specific data transfer
- 285 **3.1.7**  
 286 **Communication Channel**  
 287 access point for communication to field device
- 288 **3.1.8**  
 289 **configuration**  
 290 system created by configuring the plant components and the topology
- 291 **3.1.9**  
 292 **configure**  
 293 setting parameters at the instance data as well as the logical association of plant components  
 294 to build up the plant topology (off-line)
- 295 Note 1 to entry: See also parameterize (3.1.38).  
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- 296 **3.1.10**  
 297 **connection**  
 298 established data path for communication with a selected device
- 299 **3.1.11**  
 300 **data**  
 301 set of parameter values
- 302 **3.1.12**  
 303 **data type**  
 304 defined set of data objects of a specified data structure and a set of permissible operations,  
 305 such that these data objects act as operands in the execution of any one of these operations
- 306 [SOURCE: ISO 2382-15.04.01:1999]
- 307 **3.1.13**  
 308 **DCS manufacturer**  
 309 **system manufacturer**  
 310 manufacturer of the control system
- 311 Note 1 to entry: This note applies to the French language only.

- 312 **3.1.14**  
 313 **device**  
 314 independent physical entity of an automation system capable of performing specified  
 315 functions in a particular context and delimited by its interfaces
- 316 [SOURCE: IEC 61499-1:2012, 3.29, modified – the note has been deleted]
- 317 **3.1.15**  
 318 **field device**  
 319 networked independent physical entity of an automation system capable of performing  
 320 specified functions in a particular context and delimited by its interfaces
- 321 [SOURCE: IEC 61375-3-3:2012, 3.1.3]
- 322 **3.1.16**  
 323 **device manufacturer**  
 324 manufacturer of fieldbus devices
- 325 **3.1.17**  
 326 **device type**  
 327 device characterization based on abstract properties such as manufacturer, fieldbus protocol,  
 328 device type identifier, device classification, version information or other information
- 329 Note 1 to entry: The scope of such characterizations can vary depending on the properties that are used in the  
 330 definition of such a set and is manufacturer specific for each DTM.
- 331 **3.1.18**  
 332 **distributed system**  
 333 FDT objects that jointly are executed on different PCs in a network
- 334 Note 1 to entry: The implementation of such a distributed system is vendor specific (for example: DTM and  
 335 Presentation are executed on different PCs or DTMs are executed in a multi-user system on different PCs).
- 336 Note 2 to entry: This note applies to the French language only.
- 337 **3.1.19**  
 338 **documentation**  
 339 human readable information about a device instance
- 340 Note 1 to entry: This may be electronic information in a database.
- 341 **3.1.20**  
 342 **Device Type Manager**  
 343 **DTM**  
 344 software component containing device-specific application software
- 345 Note 1 to entry: The DTM is a generic class and means "Type Manager". The D is kept because the acronym is  
 346 well-known in the market.
- 347 Note 2 to entry: This note applies to the French language only.
- 348 **3.1.21**  
 349 **DTM device type**  
 350 software module for a particular device type within the DTM
- 351 Note 1 to entry: A DTM may contain one or more DTM device types.
- 352 **3.1.22**  
 353 **entity**  
 354 particular thing, such as a person, place, process, object, concept, association, or event

355 [SOURCE: IEC 61499-1:2012, 3.31]

356 **3.1.23**

357 **Frame Application**

358 FDT runtime environment

359 **3.1.24**

360 **FDT model**

361 interface specification for objects and object behavior in a monitoring and control system

362 **3.1.25**

363 **function**

364 specific purpose of an entity or its characteristic action

365 [SOURCE: IEC 61499-1:2012, 3.44]

366 **3.1.26**

367 **Generic DTM**

368 DTM which interprets device type or domain specific device descriptions and provides the  
369 FDT interfaces

370 Note 1 to entry: This note applies to the French language only.

371 **3.1.27**

372 **hardware**

373 physical equipment, as opposed to programs, procedures, rules and associated  
374 documentation

375 [SOURCE: IEC 61499-1:2012, 3.49]

376 **3.1.28**

377 **implementation**

378 development phase in which the hardware and software of a system become operational

379 [SOURCE: IEC 61499-1:2012, 3.51]

380 **3.1.29**

381 **instantiation**

382 creation of an instance of a specified type

383 [SOURCE: IEC 61499-1:2012, 3.57]

384 **3.1.30**

385 **interface**

386 shared boundary between two functional units, defined by functional characteristics, signal  
387 characteristics, or other characteristics as appropriate

388 [SOURCE: IEC 60050-351:2013, 351-42-25]

389 **3.1.31**

390 **Interpreter DTM**

391 Generic DTM which interprets device descriptions

392 **3.1.32**

393 **mapping**

394 set of features or attributes having defined correspondence with the members of another set

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