



**SLOVENSKI STANDARD**  
**SIST ES 201 873-1 V4.13.1:2021**

**01-oktober-2021**

---

**Metode za preskušanje in specificiranje (MTS) - 3. različica zapisa preskušanja in krmiljenja preskusov - 1. del: Jedrni jezik TTCN-3**

Methods for Testing and Specification (MTS) - The Testing and Test Control Notation version 3 - Part 1: TTCN-3 Core Language

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

**Ta slovenski standard je istoveten z: ETSI ES 201 873-1 V4.13.1 (2021-08)**

SIST ES 201 873-1 V4.13.1:2021  
<https://standards.iteh.ai/catalog/standards/sist/70bf10b8-a758-4448-ba27-41d99817f3d2/sist-es-201-873-1-v4-13-1-2021>

**ICS:**

33.040.01	Telekomunikacijski sistemi na splošno	Telecommunication systems in general
35.060	Jeziki, ki se uporabljajo v informacijski tehniki in tehnologiji	Languages used in information technology

**SIST ES 201 873-1 V4.13.1:2021**                      **en**

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

SIST ES 201 873-1 V4.13.1:2021

<https://standards.iteh.ai/catalog/standards/sist/70bf10b8-a758-4448-ba27-41d99817f3d2/sist-es-201-873-1-v4-13-1-2021>

# ETSI ES 201 873-1 V4.13.1 (2021-08)



## Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1 (TTCN-3 Core Language)

[SIST ES 201 873-1 V4.13.1:2021](https://standards.iteh.ai/catalog/standards/sist/70bf10b8-a758-4448-ba27-41d99817f3d2/sist-es-201-873-1-v4-13-1-2021)

<https://standards.iteh.ai/catalog/standards/sist/70bf10b8-a758-4448-ba27-41d99817f3d2/sist-es-201-873-1-v4-13-1-2021>

---

**Reference**

RES/MTS-201873-1V4.13.1

---

**Keywords**

language, methodology, testing, TTCN-3

**ETSI**

---

650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° w061004871

---

**Important notice**

The present document can be downloaded from:

<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at [www.etsi.org/deliver](http://www.etsi.org/deliver).

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommitteeSupportStaff.aspx>

---

**Notice of disclaimer & limitation of liability**

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

---

**Copyright Notification**

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2021.  
All rights reserved.

# Contents

Intellectual Property Rights .....	13
Foreword.....	13
Modal verbs terminology.....	14
1 Scope .....	15
2 References .....	15
2.1 Normative references .....	15
2.2 Informative references.....	16
3 Definition of terms, symbols and abbreviations.....	18
3.1 Terms.....	18
3.2 Symbols.....	23
3.3 Abbreviations .....	23
4 Introduction .....	25
4.0 General .....	25
4.1 The core language and presentation formats .....	25
4.2 Unanimity of the specification .....	27
4.3 Conformance .....	27
5 Basic language elements .....	27
5.0 General .....	27
5.1 Identifiers and keywords .....	28
5.2 Scope rules .....	28
5.2.0 General.....	28
5.2.1 Scope of formal parameters .....	31
5.2.2 Uniqueness of identifiers .....	31
5.3 Ordering of language elements.....	32
5.4 Parameterization.....	32
5.4.0 General.....	32
5.4.1 Formal parameters .....	33
5.4.1.0 General.....	33
5.4.1.1 Formal parameters of kind value.....	33
5.4.1.2 Formal parameters of kind template.....	36
5.4.2 Actual parameters .....	38
5.5 Cyclic Definitions.....	43
6 Types and values .....	44
6.0 General .....	44
6.1 Basic types and values.....	45
6.1.0 Simple basic types and values.....	45
6.1.1 Basic string types and values .....	46
6.1.1.0 General .....	46
6.1.1.1 Accessing individual string elements .....	48
6.1.2 Subtyping of basic types .....	49
6.1.2.0 General .....	49
6.1.2.1 Lists of templates .....	49
6.1.2.2 Lists of types .....	49
6.1.2.3 Ranges.....	50
6.1.2.4 String length restrictions .....	50
6.1.2.5 Pattern subtyping of character string types .....	51
6.1.2.6 Mixing subtyping mechanisms.....	51
6.1.2.6.1 Mixing patterns, lists and ranges .....	51
6.1.2.6.2 Using length restriction with other constraints .....	52
6.2 Structured types and values .....	52
6.2.0 General.....	52
6.2.1 Record type and values .....	54
6.2.1.0 General.....	54

6.2.1.1	Referencing fields of a record type .....	57
6.2.1.2	Optional elements in a record.....	58
6.2.1.3	Nested type definitions for field types .....	58
6.2.2	Set type and values .....	59
6.2.2.0	General .....	59
6.2.2.1	Referencing fields of a set type .....	59
6.2.2.2	Optional elements in a set .....	59
6.2.2.3	Nested type definition for field types .....	59
6.2.3	Records and sets of single types .....	59
6.2.3.0	General .....	59
6.2.3.1	Nested type definitions.....	62
6.2.3.2	Referencing elements of record of and set of types .....	62
6.2.4	Enumerated type and values .....	63
6.2.5	Unions.....	65
6.2.5.0	General.....	65
6.2.5.1	Referencing fields of a union type .....	66
6.2.5.2	Option and union.....	67
6.2.5.3	Nested type definition for field types .....	67
6.2.6	The anytype .....	68
6.2.7	Arrays .....	68
6.2.8	The default type .....	70
6.2.9	Communication port types.....	70
6.2.10	Component types .....	72
6.2.10.1	Component type definition.....	72
6.2.10.2	Reuse of component types .....	73
6.2.11	Component references .....	75
6.2.12	Addressing entities inside the SUT.....	77
6.2.13	Subtyping of structured types .....	79
6.2.13.0	General .....	79
6.2.13.1	Length subtyping of record ofs and set ofs .....	79
6.2.13.2	List subtyping of structured types and anytype.....	80
6.2.13.3	Subtyping of the iterated type of record ofs and set ofs.....	83
6.2.13.4	Mixing subtyping mechanisms.....	84
6.2.14	The timer type.....	84
6.2.15	Map types .....	84
6.2.15.0	General.....	84
6.2.15.1	Map Type Definition.....	84
6.2.15.2	Indexed Assignment Notation.....	85
6.2.15.3	Unmapping Keys.....	85
6.2.15.4	Index Notation.....	86
6.2.15.5	Accessing the Keys of a Map.....	86
6.2.15.6	Accessing the Values of a Map.....	87
6.2.15.7	Referencing of Elements of a Map.....	87
6.2.15.8	Nested type definitions.....	87
6.2.16	The open type .....	87
6.3	Type compatibility .....	88
6.3.0	General.....	88
6.3.1	Compatibility of non-structured types .....	88
6.3.2	Compatibility of structured types.....	90
6.3.2.0	General .....	90
6.3.2.1	Compatibility of enumerated types .....	90
6.3.2.2	Compatibility of record and record of types .....	91
6.3.2.3	Compatibility of set and set of types.....	92
6.3.2.4	Compatibility of union types.....	93
6.3.2.5	Compatibility of anytype types .....	93
6.3.2.6	Compatibility between sub-structures .....	94
6.3.2.7	Compatibility of the open type.....	94
6.3.3	Compatibility of component types.....	95
6.3.4	Type compatibility of communication and connection operations .....	95
6.3.5	Type conversion.....	96
6.3.6	Type compatibility of port types.....	96
6.3.7	Type compatibility of timer types.....	96

6.3.8	Type Compatibility of Map Types.....	96
6.4	Type synonym.....	96
7	Expressions.....	96
7.0	General.....	96
7.1	Operators.....	97
7.1.0	General.....	97
7.1.1	Arithmetic operators.....	99
7.1.2	List operator.....	99
7.1.3	Relational operators.....	100
7.1.4	Logical operators.....	103
7.1.5	Bitwise operators.....	103
7.1.6	Shift operators.....	104
7.1.7	Rotate operators.....	104
7.1.8	Presence checking operators.....	105
7.1.8.0	General.....	105
7.1.8.1	The ispresent operator.....	106
7.1.8.2	The ischosen operator.....	107
7.1.8.3	The isvalue operator.....	108
7.1.8.4	The isbound operator.....	110
7.2	Field references and list elements.....	111
7.3	Decoded field reference.....	111
8	Modules.....	112
8.0	General.....	112
8.1	Definition of a module.....	112
8.2	Module definitions part.....	113
8.2.0	General.....	113
8.2.1	Module parameters.....	114
8.2.2	Groups of definitions.....	115
8.2.3	Importing from modules.....	116
8.2.3.0	General.....	116
8.2.3.1	General format of import.....	117
8.2.3.2	Importing single definitions.....	123
8.2.3.3	Importing groups.....	124
8.2.3.4	Importing definitions of the same kind.....	125
8.2.3.5	Importing all definitions of a module.....	126
8.2.3.6	Import definitions from other TTCN-3 editions and from non-TTCN-3 modules.....	127
8.2.3.7	Importing of import statements from TTCN-3 modules.....	128
8.2.3.8	Compatibility of language specifications in imports.....	129
8.2.4	Definition of friend modules.....	130
8.2.5	Visibility of definitions.....	130
8.3	Module control part.....	132
9	Port types, component types and test configurations.....	133
9.0	General.....	133
9.1	Communication ports.....	133
9.2	Test system interface.....	136
10	Declaring constants.....	138
11	Declaring variables.....	138
11.0	General.....	138
11.1	Value variables.....	139
11.2	Template variables.....	140
12	Declaring timers.....	141
13	Declaring messages.....	142
14	Declaring procedure signatures.....	143
15	Declaring templates.....	144
15.0	General.....	144
15.1	Declaring message templates.....	145

15.2	Declaring signature templates .....	147
15.3	Global and local templates .....	148
15.4	In-line Templates.....	149
15.5	Modified templates.....	150
15.6	Referencing elements of templates or template fields .....	155
15.6.0	General.....	155
15.6.1	Referencing individual string elements.....	155
15.6.2	Referencing <b>record</b> and <b>set</b> fields.....	155
15.6.3	Referencing <b>record of</b> and <b>set of</b> elements .....	156
15.6.4	Referencing signature parameters.....	159
15.6.5	Referencing <b>union</b> alternatives.....	160
15.7	Template matching mechanisms .....	161
15.7.0	General.....	161
15.7.1	Specific values .....	162
15.7.2	Special symbols that can be used instead of values .....	163
15.7.3	Special symbols that can be used inside values .....	164
15.7.4	Special symbols which describe attributes of values .....	164
15.8	Template Restrictions.....	165
15.9	Match Operation.....	168
15.10	Valueof Operation .....	169
15.11	Concatenating templates of string and list types .....	170
15.12	The omit operation .....	172
15.13	The present operation .....	173
16	Functions, altsteps and testcases .....	174
16.0	General .....	174
16.1	Functions .....	174
16.1.0	General.....	174
16.1.1	Invoking functions .....	176
16.1.2	Predefined functions .....	177
16.1.3	External functions.....	179
16.1.4	Invoking functions from specific places.....	180
16.1.5	Explicit control functions.....	181
16.2	Altsteps.....	181
16.2.0	General.....	181
16.2.1	Invoking altsteps.....	183
16.3	Test cases.....	185
17	Void.....	186
18	Overview of program statements and operations .....	186
19	Basic program statements.....	188
19.0	General .....	188
19.1	Assignments .....	189
19.2	The If-else statement .....	190
19.3	The Select statements .....	191
19.3.1	The Select case statement .....	191
19.3.2	The Select union statement .....	192
19.4	The For statement.....	193
19.5	The While statement.....	194
19.6	The Do-while statement .....	194
19.7	The Label statement .....	194
19.8	The Goto statement .....	195
19.9	The Stop execution statement.....	196
19.10	The Return statement.....	197
19.11	The Log statement .....	198
19.12	The Break statement .....	199
19.13	The Continue statement.....	200
19.14	Statement block .....	201
20	Statement and operations for alternative behaviours.....	201
20.0	General .....	201



20.1	The snapshot mechanism.....	202
20.2	The Alt statement .....	202
20.3	The Repeat statement .....	206
20.4	The Interleave statement .....	207
20.5	Default Handling .....	209
20.5.0	General.....	209
20.5.1	The default mechanism.....	210
20.5.2	The Activate operation.....	210
20.5.3	The Deactivate operation.....	211
21	Configuration Operations .....	212
21.0	General .....	212
21.1	Connection Operations .....	213
21.1.0	General.....	213
21.1.1	The Connect and Map operations .....	214
21.1.2	The Disconnect and Unmap operations .....	216
21.2	Test case operations.....	217
21.2.0	General.....	217
21.2.1	Test case stop operation.....	218
21.3	Component Operations.....	218
21.3.0	General.....	218
21.3.1	The Create operation.....	218
21.3.2	The Start component operation.....	220
21.3.3	The Stop component operation .....	221
21.3.4	The Kill component operation .....	222
21.3.5	The Alive operation .....	223
21.3.6	The Running operation .....	224
21.3.7	The Done operation .....	225
21.3.8	The Killed operation .....	227
21.3.9	Summary of the use of any and all with components .....	230
21.3.10	The Call test component behaviour operation .....	230
22	Communication operations.....	232
22.0	General .....	232
22.1	The communication mechanisms .....	232
22.1.0	General.....	232
22.1.1	Principles of message-based communication.....	232
22.1.2	Principles of procedure-based communication .....	233
22.1.3	Principles of unicast, multicast and broadcast communication.....	233
22.1.4	General format of communication operations .....	234
22.1.4.0	General .....	234
22.1.4.1	General format of the sending operations .....	234
22.1.4.2	General format of the receiving operations .....	235
22.2	Message-based communication.....	236
22.2.0	General.....	236
22.2.1	The Send operation .....	236
22.2.2	The Receive operation .....	237
22.2.3	The Trigger operation .....	241
22.3	Procedure-based communication.....	244
22.3.0	General.....	244
22.3.1	The Call operation .....	244
22.3.2	The Getcall operation.....	248
22.3.3	The Reply operation.....	251
22.3.4	The Getreply operation .....	252
22.3.5	The Raise operation .....	255
22.3.6	The Catch operation.....	256
22.4	The Check operation .....	260
22.5	Controlling communication ports.....	262
22.5.0	General.....	262
22.5.1	The Clear port operation .....	262
22.5.2	The Start port operation .....	263
22.5.3	The Stop port operation .....	263

22.5.4	The Halt port operation.....	264
22.5.5	The Checkstate port operation .....	264
22.6	Use of any and all with ports .....	266
23	Timer operations .....	266
23.0	General .....	266
23.1	The timer mechanism.....	267
23.2	The Start timer operation.....	267
23.3	The Stop timer operation.....	268
23.4	The Read timer operation .....	268
23.5	The Running timer operation.....	269
23.6	The Timeout operation .....	270
23.7	Summary of use of any and all with timers .....	271
24	Test verdict operations .....	271
24.0	General .....	271
24.1	The Verdict mechanism.....	271
24.2	The Setverdict operation .....	272
24.3	The Getverdict operation.....	273
25	External actions .....	274
26	Module control .....	274
26.0	General .....	274
26.1	The Execute statement.....	275
26.2	Test suite execution .....	276
26.3	Parallel control components .....	278
27	Specifying attributes.....	278
27.0	General .....	278
27.1	The Attribute mechanism .....	279
27.1.0	General.....	279
27.1.1	Scope of attributes .....	279
27.1.2	Overwriting rules for attributes.....	280
27.1.2.0	General .....	280
27.1.2.1	Additional default overwriting rules for variant attributes .....	282
27.1.2.2	Overwriting rules for multiple encoding.....	283
27.1.3	Changing attributes of imported language elements .....	283
27.2	The With statement .....	284
27.3	Display attributes.....	285
27.4	Encoding attributes.....	286
27.5	Variant attributes .....	287
27.6	Extension attributes .....	289
27.7	Optional attributes .....	289
27.8	Retrieving attribute values.....	291
27.9	Dynamic configuration of encoding used by ports.....	292
<b>Annex A (normative): BNF and static semantics .....</b>		<b>294</b>
A.1	TTCN-3 BNF .....	294
A.1.0	General .....	294
A.1.1	Conventions for the syntax description .....	294
A.1.2	Statement terminator symbols .....	294
A.1.3	Identifiers .....	294
A.1.4	Comments.....	294
A.1.5	TTCN-3 terminals .....	295
A.1.5.0	General.....	295
A.1.5.1	Use of whitespaces and newlines.....	297
A.1.6	TTCN-3 syntax BNF productions .....	298
A.1.6.0	TTCN-3 module.....	298
A.1.6.1	Module definitions part.....	298
A.1.6.1.0	General .....	298
A.1.6.1.1	Typedef definitions .....	298
A.1.6.1.2	Constant definitions .....	300

A.1.6.1.3	Template definitions.....	300
A.1.6.1.4	Function definitions .....	302
A.1.6.1.5	Signature definitions .....	303
A.1.6.1.6	Testcase definitions.....	303
A.1.6.1.7	Altstep definitions .....	303
A.1.6.1.8	Import definitions.....	303
A.1.6.1.9	Group definitions .....	304
A.1.6.1.10	External function definitions .....	304
A.1.6.1.11	Void.....	305
A.1.6.1.12	Module parameter definitions .....	305
A.1.6.1.13	Friend module definitions .....	305
A.1.6.2	Module control function .....	305
A.1.6.3	Local definitions .....	305
A.1.6.3.1	Variable instantiation .....	305
A.1.6.3.2	Timer instantiation .....	305
A.1.6.4	Operations.....	305
A.1.6.4.1	Component operations .....	305
A.1.6.4.2	Port operations .....	306
A.1.6.4.3	Timer operations .....	308
A.1.6.4.4	Testcase operation.....	308
A.1.6.5	Type.....	308
A.1.6.6	Value.....	309
A.1.6.7	Parameterization .....	310
A.1.6.8	Statements.....	310
A.1.6.8.1	With statement .....	310
A.1.6.8.2	Behaviour statements .....	311
A.1.6.8.3	Basic statements .....	312
A.1.6.9	Miscellaneous productions .....	314

## **Annex B (normative): Matching values ..... 315**

B.1	Template matching mechanisms .....	315
B.1.0	General .....	315
B.1.1	Matching specific values .....	315
B.1.2	Matching mechanisms instead of values .....	315
B.1.2.0	General.....	315
B.1.2.1	Template list .....	315
B.1.2.2	Complemented template list .....	316
B.1.2.3	Any value.....	317
B.1.2.4	Any value or none.....	318
B.1.2.5	Value range.....	319
B.1.2.6	SuperSet.....	319
B.1.2.7	SubSet.....	320
B.1.2.8	Omitting optional fields .....	322
B.1.2.9	Matching decoded content .....	322
B.1.2.10	Matching enumerated value with value list .....	324
B.1.3	Matching mechanisms inside values .....	324
B.1.3.0	General.....	324
B.1.3.1	Any element.....	324
B.1.3.1.0	General.....	324
B.1.3.1.1	Using single character wildcards.....	324
B.1.3.2	Any number of elements or no element .....	325
B.1.3.2.0	General .....	325
B.1.3.2.1	Using multiple character wildcards.....	325
B.1.3.3	Permutation.....	325
B.1.4	Matching attributes of values .....	327
B.1.4.0	General.....	327
B.1.4.1	Length restrictions .....	327
B.1.4.2	The IfPresent indicator.....	328
B.1.5	Matching character pattern .....	329
B.1.5.0	General.....	329
B.1.5.1	Set expression .....	331

B.1.5.2	Reference expression .....	331
B.1.5.3	Match expression n times .....	333
B.1.5.4	Match a referenced character set.....	333
B.1.5.5	Type compatibility rules for patterns .....	334
B.1.5.6	Case insensitive pattern matching.....	334
<b>Annex C (normative): Predefined TTCN-3 functions.....</b>		<b>335</b>
C.0	General exception handling procedures .....	335
C.1	Conversion functions.....	335
C.1.1	Integer to character .....	335
C.1.2	Integer to universal character .....	335
C.1.3	Integer to bitstring .....	335
C.1.4	Integer to enumerated.....	336
C.1.5	Integer to hexstring.....	336
C.1.6	Integer to octetstring .....	336
C.1.7	Integer to charstring.....	337
C.1.8	Integer to float .....	337
C.1.9	Float to integer .....	337
C.1.10	Character to integer .....	337
C.1.11	Character to octetstring .....	337
C.1.12	Universal character to integer.....	338
C.1.13	Bitstring to integer.....	338
C.1.14	Bitstring to hexstring .....	338
C.1.15	Bitstring to octetstring .....	338
C.1.16	Bitstring to charstring.....	339
C.1.17	Hexstring to integer.....	339
C.1.18	Hexstring to bitstring .....	339
C.1.19	Hexstring to octetstring .....	340
C.1.20	Hexstring to charstring .....	340
C.1.21	Octetstring to integer .....	340
C.1.22	Octetstring to bitstring .....	340
C.1.23	Octetstring to hexstring .....	341
C.1.24	Octetstring to character string .....	341
C.1.25	Octetstring to character string, version II .....	341
C.1.26	Charstring to integer.....	342
C.1.27	Character string to hexstring .....	342
C.1.28	Character string to octetstring .....	342
C.1.29	Character string to float.....	343
C.1.30	Enumerated to integer .....	343
C.1.31	Octetstring to universal character string.....	344
C.1.32	Universal character string to octetstring.....	344
C.1.33	Value or template to universal charstring.....	345
C.2	Length/size functions .....	346
C.2.1	Length of strings and lists .....	346
C.2.2	Number of elements in a structured value.....	347
C.3	Presence checking functions .....	348
C.3.1	Void.....	348
C.3.2	Void.....	348
C.3.3	Void.....	348
C.3.4	Void.....	348
C.3.5	Matching mechanism detection.....	348
C.4	String/list handling functions .....	349
C.4.1	The Regexp function .....	349
C.4.2	The Substring function .....	351
C.4.3	The Replace function.....	352
C.5	Codec functions.....	353
C.5.1	The encoding function.....	353
C.5.2	The decoding function.....	353

C.5.3	The encoding to universal charstring function .....	353
C.5.4	The decoding from universal charstring function.....	354
C.5.5	The encoding to octetstring function.....	356
C.5.6	The decoding from octetstring function .....	356
C.5.7	Retrieving the type of string encoding .....	357
C.5.8	Removing BOMs of UCS encoding schemes.....	357
C.6	Other functions.....	358
C.6.1	The random number generator function .....	358
C.6.2	The testcasename function .....	358
C.6.3	The hostId function .....	359
<b>Annex D (normative): Preprocessing macros.....</b>		<b>360</b>
D.0	General .....	360
D.1	Preprocessing macro <code>__MODULE__</code> .....	360
D.2	Preprocessing macro <code>__FILE__</code> .....	360
D.3	Preprocessing macro <code>__BFILE__</code> .....	360
D.4	Preprocessing macro <code>__LINE__</code> .....	360
D.5	Preprocessing macro <code>__SCOPE__</code> .....	361
<b>Annex E (informative): Library of Useful Types .....</b>		<b>363</b>
E.1	Limitations .....	363
E.2	Useful TTCN-3 types.....	363
E.2.1	Useful simple basic types.....	363
E.2.1.0	Signed and unsigned single byte integers.....	363
E.2.1.1	Signed and unsigned short integers.....	363
E.2.1.2	Signed and unsigned long integers.....	364
E.2.1.3	Signed and unsigned longlong integers.....	364
E.2.1.4	IEEE 754 floats.....	364
E.2.2	Useful character string types.....	365
E.2.2.0	UTF-8 character string "utf8string" .....	365
E.2.2.1	BMP character string "bmpstring".....	365
E.2.2.2	UTF-16 character string "utf16string" .....	365
E.2.2.3	ISO/IEC 10646 character string "iso8859string" .....	365
E.2.2.4	Status values for TTCN-3 objects.....	366
E.2.2.5	Template kinds of TTCN-3 objects .....	366
E.2.3	Useful structured types.....	366
E.2.3.0	Fixed-point decimal literal.....	366
E.2.4	Useful atomic string types.....	367
E.2.4.1	Single Recommendation ITU-T T.50 character type.....	367
E.2.4.2	Single universal character type.....	367
E.2.4.3	Single bit type.....	367
E.2.4.4	Single hex type .....	367
E.2.4.5	Single octet type .....	367
<b>Annex F (informative): Operations on TTCN-3 active objects.....</b>		<b>368</b>
F.0	General .....	368
F.1	Test components.....	368
F.1.1	Test component references.....	368
F.1.2	Dynamic behaviour of PTCs .....	369
F.1.3	Dynamic behaviour of the MTC.....	371
F.2	Timers.....	372
F.3	Ports.....	372
F.3.0	General .....	372
F.3.1	Configuration Operations .....	372

F.3.2	Port Controlling Operations .....	373
F.3.3	Communication Operations.....	374
<b>Annex G (informative):      Deprecated language features.....</b>		<b>375</b>
G.1	Group style definition of module parameters.....	375
G.2	Void.....	375
G.3	Using <b>a11</b> in port type definitions.....	375
G.4	sizeof for length of lists.....	375
G.5	Void.....	375
G.6	Mixed ports .....	375
G.7	Void.....	375
G.8	Void.....	376
G.9	Void.....	376
G.10	Void.....	376
G.11	Void.....	376
G.12	Void.....	376
G.13	Assignment of less restrictive templates to more restrictive templates.....	376
G.14	Mixing case and case else branches in select statements.....	376
G.15	Partially initialized global and local templates.....	376
G.16	Template modification of less restrictive templates to more restrictive templates .....	377
<b>Annex H (informative):      Bibliography .....</b>		<b>378</b>
History .....	<a href="https://standards.iteh.ai/catalog/standards/sist/70bf10b8-a758-4448-ba27-41d998175d2/sist-es-201-873-1-v4-13-1-2021">https://standards.iteh.ai/catalog/standards/sist/70bf10b8-a758-4448-ba27-41d998175d2/sist-es-201-873-1-v4-13-1-2021</a>	379

# Intellectual Property Rights

## Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org/>).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

## Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

**DECT™**, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

ITih STANDARD PREVIEW  
(standards.iteh.ai)

# Foreword

SIST ES 201 873-1 V4.13.1:2021

This ETSI Standard (ES) has been produced by ETSI Technical Committee Methods for Testing and Specification (MTS).

<https://standards.iteh.org/catalog/standards/siv/7061f668-a738-4448-ba27-41d99817f3d2/sist-es-201-873-1-v4-13-1-2021>

The present document is part 1 of a multi-part deliverable covering the Testing and Test Control Notation version 3, as identified below:

- Part 1:** "TTCN-3 Core Language";
- Part 3: "TTCN-3 Graphical presentation Format (GFT)";
- Part 4: "TTCN-3 Operational Semantics";
- Part 5: "TTCN-3 Runtime Interface (TRI)";
- Part 6: "TTCN-3 Control Interface (TCI)";
- Part 7: "Using ASN.1 with TTCN-3";
- Part 8: "The IDL to TTCN-3 Mapping";
- Part 9: "Using XML schema with TTCN-3";
- Part 10: "TTCN-3 Documentation Comment Specification";
- Part 11: "Using JSON with TTCN-3".

NOTE 1: Part 2: "TTCN-3 Tabular presentation Format (TFT)" of this multi-part deliverable is in status "historical".

NOTE 2: Part 3 of this multi-part deliverable is not maintained.