



**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)  
Full standard: <https://standards.iteh.ai/catalog/standards/sis/1b9486588701/etsi-es-201-873-1-v4-9-1-2017-05>  
428b-b8d0-1b9486588701/etsi-es-201-873-1-v4-9-1-2017-05*

---

Reference

RES/MTS-201873 -1 T3ed491

---

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 - NAF 742 C  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° 7803/88

---

**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 only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

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/ETSI/DeliverableStatus.aspx>

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

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

---

**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.

© European Telecommunications Standards Institute 2017.

All rights reserved.

**DECT™**, **PLUGTESTS™**, **UMTS™** and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.

**3GPP™** and **LTE™** are Trade Marks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

**oneM2M** logo is protected for the benefit of its Members

**GSM®** and the GSM logo are Trade Marks registered and owned by the GSM Association.

# Contents

Intellectual Property Rights .....	13
Foreword.....	13
Modal verbs terminology.....	13
1 Scope .....	14
2 References .....	14
2.1 Normative references .....	14
2.2 Informative references.....	15
3 Definitions and abbreviations.....	16
3.1 Definitions.....	16
3.2 Abbreviations .....	21
4 Introduction .....	22
4.0 General .....	22
4.1 The core language and presentation formats .....	22
4.2 Unanimity of the specification .....	24
4.3 Conformance .....	24
5 Basic language elements .....	24
5.0 General .....	24
5.1 Identifiers and keywords .....	25
5.2 Scope rules .....	25
5.2.0 General.....	25
5.2.1 Scope of formal parameters .....	28
5.2.2 Uniqueness of identifiers .....	28
5.3 Ordering of language elements.....	29
5.4 Parameterization.....	29
5.4.0 General.....	29
5.4.1 Formal parameters .....	30
5.4.1.0 General.....	30
5.4.1.1 Formal parameters of kind value.....	30
5.4.1.2 Formal parameters of kind template.....	33
5.4.1.3 Formal parameters of kind timer.....	35
5.4.1.4 Formal parameters of kind port.....	35
5.4.2 Actual parameters .....	36
5.5 Cyclic Definitions.....	41
6 Types and values .....	42
6.0 General .....	42
6.1 Basic types and values.....	43
6.1.0 Simple basic types and values.....	43
6.1.1 Basic string types and values .....	43
6.1.1.0 General .....	43
6.1.1.1 Accessing individual string elements.....	46
6.1.2 Subtyping of basic types .....	46
6.1.2.0 General.....	46
6.1.2.1 Lists of templates .....	47
6.1.2.2 Lists of types .....	47
6.1.2.3 Ranges.....	47
6.1.2.4 String length restrictions .....	48
6.1.2.5 Pattern subtyping of character string types .....	48
6.1.2.6 Mixing subtyping mechanisms.....	49
6.1.2.6.1 Mixing patterns, lists and ranges .....	49
6.1.2.6.2 Using length restriction with other constraints .....	49
6.2 Structured types and values .....	50
6.2.0 General.....	50
6.2.1 Record type and values .....	51

6.2.1.0	General .....	51
6.2.1.1	Referencing fields of a record type .....	54
6.2.1.2	Optional elements in a record.....	55
6.2.1.3	Nested type definitions for field types .....	56
6.2.2	Set type and values .....	56
6.2.2.0	General .....	56
6.2.2.1	Referencing fields of a set type .....	56
6.2.2.2	Optional elements in a set .....	56
6.2.2.3	Nested type definition for field types .....	57
6.2.3	Records and sets of single types .....	57
6.2.3.0	General .....	57
6.2.3.1	Nested type definitions.....	59
6.2.3.2	Referencing elements of record of and set of types .....	60
6.2.4	Enumerated type and values .....	61
6.2.5	Unions.....	62
6.2.5.0	General .....	62
6.2.5.1	Referencing fields of a union type .....	63
6.2.5.2	Option and union.....	64
6.2.5.3	Nested type definition for field types .....	65
6.2.6	The anytype .....	65
6.2.7	Arrays .....	65
6.2.8	The default type .....	67
6.2.9	Communication port types.....	67
6.2.10	Component types .....	69
6.2.10.1	Component type definition.....	69
6.2.10.2	Reuse of component types .....	70
6.2.11	Component references .....	72
6.2.12	Addressing entities inside the SUT.....	74
6.2.13	Subtyping of structured types .....	76
6.2.13.0	General .....	76
6.2.13.1	Length subtyping of record ofs and set ofs .....	76
6.2.13.2	List subtyping of structured types and anytype .....	77
6.2.13.3	Subtyping of the iterated type of record ofs and set ofs .....	80
6.2.13.4	Mixing subtyping mechanisms.....	81
6.3	Type compatibility .....	81
6.3.0	General.....	81
6.3.1	Compatibility of non-structured types .....	81
6.3.2	Compatibility of structured types.....	83
6.3.2.0	General .....	83
6.3.2.1	Compatibility of enumerated types .....	83
6.3.2.2	Compatibility of record and record of types .....	83
6.3.2.3	Compatibility of set and set of types .....	84
6.3.2.4	Compatibility of union types.....	85
6.3.2.5	Compatibility of anytype types .....	86
6.3.2.6	Compatibility between sub-structures .....	87
6.3.3	Compatibility of component types.....	87
6.3.4	Type compatibility of communication and connection operations .....	88
6.3.5	Type conversion.....	88
6.4	Type synonym .....	88
7	Expressions.....	89
7.0	General .....	89
7.1	Operators .....	89
7.1.0	General.....	89
7.1.1	Arithmetic operators .....	91
7.1.2	List operator.....	92
7.1.3	Relational operators .....	92
7.1.4	Logical operators .....	94
7.1.5	Bitwise operators .....	95
7.1.6	Shift operators.....	96
7.1.7	Rotate operators .....	96
7.2	Field references and list elements.....	97

7.3	Decoded field reference.....	97
8	Modules.....	98
8.0	General.....	98
8.1	Definition of a module.....	98
8.2	Module definitions part.....	99
8.2.0	General.....	99
8.2.1	Module parameters.....	100
8.2.2	Groups of definitions.....	102
8.2.3	Importing from modules.....	103
8.2.3.0	General.....	103
8.2.3.1	General format of import.....	103
8.2.3.2	Importing single definitions.....	109
8.2.3.3	Importing groups.....	110
8.2.3.4	Importing definitions of the same kind.....	111
8.2.3.5	Importing all definitions of a module.....	112
8.2.3.6	Import definitions from other TTCN-3 editions and from non-TTCN-3 modules.....	112
8.2.3.7	Importing of import statements from TTCN-3 modules.....	114
8.2.3.8	Compatibility of language specifications in imports.....	115
8.2.4	Definition of friend modules.....	116
8.2.5	Visibility of definitions.....	116
8.3	Module control part.....	118
9	Port types, component types and test configurations.....	118
9.0	General.....	118
9.1	Communication ports.....	119
9.2	Test system interface.....	121
10	Declaring constants.....	123
11	Declaring variables.....	123
11.0	General.....	123
11.1	Value variables.....	124
11.2	Template variables.....	125
12	Declaring timers.....	126
13	Declaring messages.....	127
14	Declaring procedure signatures.....	128
15	Declaring templates.....	129
15.0	General.....	129
15.1	Declaring message templates.....	130
15.2	Declaring signature templates.....	131
15.3	Global and local templates.....	133
15.4	In-line Templates.....	134
15.5	Modified templates.....	135
15.6	Referencing elements of templates or template fields.....	138
15.6.0	General.....	138
15.6.1	Referencing individual string elements.....	138
15.6.2	Referencing <b>record</b> and <b>set</b> fields.....	138
15.6.3	Referencing <b>record of</b> and <b>set of</b> elements.....	139
15.6.4	Referencing signature parameters.....	143
15.6.5	Referencing <b>union</b> alternatives.....	143
15.7	Template matching mechanisms.....	144
15.7.0	General.....	144
15.7.1	Specific values.....	145
15.7.2	Special symbols that can be used instead of values.....	146
15.7.3	Special symbols that can be used inside values.....	147
15.7.4	Special symbols which describe attributes of values.....	147
15.8	Template Restrictions.....	148
15.9	Match Operation.....	150
15.10	Valueof Operation.....	152

15.11	Concatenating templates of string and list types .....	152
16	Functions, altsteps and testcases .....	154
16.0	General .....	154
16.1	Functions .....	154
16.1.0	General.....	154
16.1.1	Invoking functions .....	156
16.1.2	Predefined functions .....	157
16.1.3	External functions .....	159
16.1.4	Invoking functions from specific places .....	160
16.2	Altsteps.....	161
16.2.0	General.....	161
16.2.1	Invoking altsteps.....	163
16.3	Test cases.....	164
17	Void.....	165
18	Overview of program statements and operations .....	165
19	Basic program statements.....	167
19.0	General .....	167
19.1	Assignments .....	168
19.2	The If-else statement .....	170
19.3	The Select statements .....	170
19.3.1	The Select case statement .....	170
19.3.2	The Select union statement .....	171
19.4	The For statement.....	172
19.5	The While statement.....	173
19.6	The Do-while statement .....	173
19.7	The Label statement .....	174
19.8	The Goto statement .....	174
19.9	The Stop execution statement.....	175
19.10	The Return statement.....	176
19.11	The Log statement .....	177
19.12	The Break statement.....	178
19.13	The Continue statement.....	179
19.14	Statement block .....	180
20	Statement and operations for alternative behaviours.....	180
20.0	General .....	180
20.1	The snapshot mechanism.....	181
20.2	The Alt statement .....	181
20.3	The Repeat statement .....	185
20.4	The Interleave statement .....	186
20.5	Default Handling .....	188
20.5.0	General.....	188
20.5.1	The default mechanism.....	189
20.5.2	The Activate operation.....	189
20.5.3	The Deactivate operation.....	190
21	Configuration Operations .....	191
21.0	General .....	191
21.1	Connection Operations .....	192
21.1.0	General.....	192
21.1.1	The Connect and Map operations .....	193
21.1.2	The Disconnect and Unmap operations .....	195
21.2	Test case operations.....	196
21.2.0	General.....	196
21.2.1	Test case stop operation .....	197
21.3	Test Component Operations .....	197
21.3.0	General.....	197
21.3.1	The Create operation.....	197
21.3.2	The Start test component operation .....	198
21.3.3	The Stop test behaviour operation .....	200

21.3.4	The Kill test component operation.....	201
21.3.5	The Alive operation .....	202
21.3.6	The Running operation .....	203
21.3.7	The Done operation .....	204
21.3.8	The Killed operation .....	206
21.3.9	Summary of the use of any and all with components .....	208
22	Communication operations.....	208
22.0	General .....	208
22.1	The communication mechanisms .....	209
22.1.0	General.....	209
22.1.1	Principles of message-based communication.....	209
22.1.2	Principles of procedure-based communication .....	210
22.1.3	Principles of unicast, multicast and broadcast communication.....	210
22.1.4	General format of communication operations .....	211
22.1.4.0	General .....	211
22.1.4.1	General format of the sending operations .....	211
22.1.4.2	General format of the receiving operations .....	212
22.2	Message-based communication.....	213
22.2.0	General.....	213
22.2.1	The Send operation .....	213
22.2.2	The Receive operation .....	214
22.2.3	The Trigger operation.....	218
22.3	Procedure-based communication.....	221
22.3.0	General.....	221
22.3.1	The Call operation .....	221
22.3.2	The Getcall operation.....	225
22.3.3	The Reply operation.....	228
22.3.4	The Getreply operation.....	229
22.3.5	The Raise operation .....	232
22.3.6	The Catch operation.....	233
22.4	The Check operation .....	236
22.5	Controlling communication ports .....	239
22.5.0	General.....	239
22.5.1	The Clear port operation.....	239
22.5.2	The Start port operation .....	239
22.5.3	The Stop port operation .....	240
22.5.4	The Halt port operation.....	240
22.5.5	The Checkstate port operation.....	241
22.6	Use of any and all with ports.....	242
23	Timer operations .....	243
23.0	General .....	243
23.1	The timer mechanism .....	243
23.2	The Start timer operation.....	243
23.3	The Stop timer operation.....	244
23.4	The Read timer operation .....	245
23.5	The Running timer operation.....	245
23.6	The Timeout operation .....	246
23.7	Summary of use of any and all with timers .....	247
24	Test verdict operations .....	247
24.0	General .....	247
24.1	The Verdict mechanism.....	248
24.2	The Setverdict operation .....	249
24.3	The Getverdict operation.....	250
25	External actions .....	250
26	Module control .....	250
26.0	General .....	250
26.1	The Execute statement.....	251
26.2	The Control part .....	253



27	Specifying attributes.....	255
27.0	General.....	255
27.1	The Attribute mechanism.....	255
27.1.0	General.....	255
27.1.1	Scope of attributes.....	255
27.1.2	Overwriting rules for attributes.....	256
27.1.2.0	General.....	256
27.1.2.1	Additional default overwriting rules for variant attributes.....	259
27.1.2.2	Overwriting rules for multiple encoding.....	260
27.1.3	Changing attributes of imported language elements.....	260
27.2	The With statement.....	261
27.3	Display attributes.....	262
27.4	Encoding attributes.....	262
27.5	Variant attributes.....	263
27.6	Extension attributes.....	266
27.7	Optional attributes.....	266
27.8	Retrieving attribute values.....	268
27.9	Dynamic configuration of encoding used by ports.....	269

## **Annex A (normative): BNF and static semantics .....271**

A.1	TTCN-3 BNF.....	271
A.1.0	General.....	271
A.1.1	Conventions for the syntax description.....	271
A.1.2	Statement terminator symbols.....	271
A.1.3	Identifiers.....	271
A.1.4	Comments.....	272
A.1.5	TTCN-3 terminals.....	272
A.1.5.0	General.....	272
A.1.5.1	Use of whitespaces and newlines.....	274
A.1.6	TTCN-3 syntax BNF productions.....	274
A.1.6.0	TTCN-3 module.....	274
A.1.6.1	Module definitions part.....	274
A.1.6.1.0	General.....	274
A.1.6.1.1	Typedef definitions.....	275
A.1.6.1.2	Constant definitions.....	277
A.1.6.1.3	Template definitions.....	277
A.1.6.1.4	Function definitions.....	279
A.1.6.1.5	Signature definitions.....	280
A.1.6.1.6	Testcase definitions.....	280
A.1.6.1.7	Altstep definitions.....	280
A.1.6.1.8	Import definitions.....	280
A.1.6.1.9	Group definitions.....	281
A.1.6.1.10	External function definitions.....	281
A.1.6.1.11	External constant definitions.....	281
A.1.6.1.12	Module parameter definitions.....	281
A.1.6.1.13	Friend module definitions.....	281
A.1.6.2	Control part.....	281
A.1.6.3	Local definitions.....	282
A.1.6.3.1	Variable instantiation.....	282
A.1.6.3.2	Timer instantiation.....	282
A.1.6.4	Operations.....	282
A.1.6.4.1	Component operations.....	282
A.1.6.4.2	Port operations.....	283
A.1.6.4.3	Timer operations.....	285
A.1.6.4.4	Testcase operation.....	285
A.1.6.5	Type.....	285
A.1.6.6	Value.....	286
A.1.6.7	Parameterization.....	287
A.1.6.8	Statements.....	287
A.1.6.8.1	With statement.....	287
A.1.6.8.2	Behaviour statements.....	288



A.1.6.8.3	Basic statements .....	288
A.1.6.9	Miscellaneous productions .....	291

## **Annex B (normative): Matching values .....292**

B.1	Template matching mechanisms .....	292
B.1.0	General .....	292
B.1.1	Matching specific values .....	292
B.1.2	Matching mechanisms instead of values .....	292
B.1.2.0	General.....	292
B.1.2.1	Template list .....	292
B.1.2.2	Complemented template list .....	293
B.1.2.3	Any value.....	294
B.1.2.4	Any value or none.....	295
B.1.2.5	Value range.....	296
B.1.2.6	SuperSet.....	296
B.1.2.7	SubSet.....	297
B.1.2.8	Omitting optional fields .....	299
B.1.2.9	Matching decoded content .....	299
B.1.2.10	Matching enumerated value with value list .....	301
B.1.3	Matching mechanisms inside values .....	301
B.1.3.0	General.....	301
B.1.3.1	Any element.....	301
B.1.3.1.0	General .....	301
B.1.3.1.1	Using single character wildcards.....	301
B.1.3.2	Any number of elements or no element.....	302
B.1.3.2.0	General .....	302
B.1.3.2.1	Using multiple character wildcards.....	302
B.1.3.3	Permutation.....	302
B.1.4	Matching attributes of values .....	304
B.1.4.0	General.....	304
B.1.4.1	Length restrictions .....	304
B.1.4.2	The IfPresent indicator.....	305
B.1.5	Matching character pattern .....	306
B.1.5.0	General.....	306
B.1.5.1	Set expression .....	308
B.1.5.2	Reference expression .....	308
B.1.5.3	Match expression n times .....	310
B.1.5.4	Match a referenced character set.....	310
B.1.5.5	Type compatibility rules for patterns .....	311
B.1.5.6	Case insensitive pattern matching.....	311

## **Annex C (normative): Predefined TTCN-3 functions.....312**

C.0	General exception handling procedures .....	312
C.1	Conversion functions.....	312
C.1.1	Integer to character .....	312
C.1.2	Integer to universal character .....	312
C.1.3	Integer to bitstring .....	312
C.1.4	Integer to enumerated.....	313
C.1.5	Integer to hexstring.....	313
C.1.6	Integer to octetstring.....	313
C.1.7	Integer to charstring.....	314
C.1.8	Integer to float .....	314
C.1.9	Float to integer .....	314
C.1.10	Character to integer .....	314
C.1.11	Character to octetstring .....	314
C.1.12	Universal character to integer.....	315
C.1.13	Bitstring to integer.....	315
C.1.14	Bitstring to hexstring.....	315
C.1.15	Bitstring to octetstring.....	316
C.1.16	Bitstring to charstring.....	316

C.1.17	Hexstring to integer .....	316
C.1.18	Hexstring to bitstring .....	316
C.1.19	Hexstring to octetstring .....	317
C.1.20	Hexstring to charstring .....	317
C.1.21	Octetstring to integer .....	317
C.1.22	Octetstring to bitstring .....	318
C.1.23	Octetstring to hexstring .....	318
C.1.24	Octetstring to character string .....	318
C.1.25	Octetstring to character string, version II .....	318
C.1.26	Charstring to integer .....	319
C.1.27	Character string to hexstring .....	319
C.1.28	Character string to octetstring .....	319
C.1.29	Character string to float .....	320
C.1.30	Enumerated to integer .....	320
C.1.31	Octetstring to universal character string .....	321
C.1.32	Universal character string to octetstring .....	321
C.1.33	Value or template to universal charstring .....	322
C.2	Length/size functions .....	322
C.2.1	Length of strings and lists .....	322
C.2.2	Number of elements in a structured value .....	324
C.3	Presence checking functions .....	325
C.3.1	The IsPresent function .....	325
C.3.2	The IsChosen function .....	326
C.3.3	The IsValue function .....	327
C.3.4	The IsBound function .....	328
C.3.5	Matching mechanism detection .....	329
C.4	String/list handling functions .....	330
C.4.1	The Regexp function .....	330
C.4.2	The Substring function .....	332
C.4.3	The Replace function .....	333
C.5	Codec functions .....	333
C.5.1	The encoding function .....	333
C.5.2	The decoding function .....	334
C.5.3	The encoding to universal charstring function .....	334
C.5.4	The decoding from universal charstring function .....	335
C.5.5	The encoding to octetstring function .....	337
C.5.6	The decoding from octetstring function .....	337
C.5.7	Retrieving the type of string encoding .....	337
C.5.8	Removing BOMs of UCS encoding schemes .....	338
C.6	Other functions .....	338
C.6.1	The random number generator function .....	338
C.6.2	The testcasename function .....	339
C.6.3	The hostId function .....	339
<b>Annex D (normative):</b>	<b>Preprocessing macros .....</b>	<b>341</b>
D.0	General .....	341
D.1	Preprocessing macro <code>__MODULE__</code> .....	341
D.2	Preprocessing macro <code>__FILE__</code> .....	341
D.3	Preprocessing macro <code>__BFILE__</code> .....	341
D.4	Preprocessing macro <code>__LINE__</code> .....	341
D.5	Preprocessing macro <code>__SCOPE__</code> .....	342
<b>Annex E (informative):</b>	<b>Library of Useful Types .....</b>	<b>344</b>
E.1	Limitations .....	344

E.2	Useful TTCN-3 types .....	344
E.2.1	Useful simple basic types .....	344
E.2.1.0	Signed and unsigned single byte integers .....	344
E.2.1.1	Signed and unsigned short integers.....	344
E.2.1.2	Signed and unsigned long integers .....	345
E.2.1.3	Signed and unsigned longlong integers .....	345
E.2.1.4	IEEE 754™ floats.....	345
E.2.2	Useful character string types .....	346
E.2.2.0	UTF-8 character string "utf8string" .....	346
E.2.2.1	BMP character string "bmpstring".....	346
E.2.2.2	UTF-16 character string "utf16string" .....	346
E.2.2.3	ISO/IEC 10646 character string "iso8859string" .....	346
E.2.2.4	Status values for TTCN-3 objects.....	347
E.2.2.5	Template kinds of TTCN-3 objects .....	347
E.2.3	Useful structured types.....	347
E.2.3.0	Fixed-point decimal literal.....	347
E.2.4	Useful atomic string types.....	348
E.2.4.1	Single Recommendation ITU-T T.50 character type.....	348
E.2.4.2	Single universal character type.....	348
E.2.4.3	Single bit type.....	348
E.2.4.4	Single hex type .....	348
E.2.4.5	Single octet type .....	348
<b>Annex F (informative):</b>	<b>Operations on TTCN-3 active objects.....</b>	<b>349</b>
F.0	General .....	349
F.1	Test components.....	349
F.1.1	Test component references .....	349
F.1.2	Dynamic behaviour of PTCs .....	350
F.1.3	Dynamic behaviour of the MTC.....	352
F.2	Timers.....	352
F.3	Ports.....	353
F.3.0	General .....	353
F.3.1	Configuration Operations .....	353
F.3.2	Port Controlling Operations .....	354
F.3.3	Communication Operations.....	355
<b>Annex G (informative):</b>	<b>Deprecated language features.....</b>	<b>356</b>
G.1	Group style definition of module parameters.....	356
G.2	Recursive import .....	356
G.3	Using <b>all</b> in port type definitions.....	356
G.4	sizeof for length of lists.....	356
G.5	sizeoftype predefined function .....	356
G.6	Mixed ports .....	356
G.7	External constants .....	357
G.8	Prefixing enumerated values .....	357
G.9	Record of/arrays not compatible to record; set of not compatible with set.....	357
G.10	The "UCS-2" predefined variant attribute string.....	357
G.11	Prefixing identifiers of local definitions with module identifiers.....	357
G.12	Matching expressions of incompatible types .....	357
<b>Annex H (informative):</b>	<b>Bibliography.....</b>	<b>358</b>

History ..... 359

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**  
Full standard:  
<https://standards.iteh.ai/catalog/standards/sist/7b4ab4ec-ce12-428b-b8d0-1b9486588701/etsi-es-201-873-1-v4.9.1-2017-05>

---

## Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is 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 IPR Policy, no investigation, 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.

---

## Foreword

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

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 2: "TTCN-3 Tabular presentation Format (TFT)";

NOTE: Part 2 of this multi-part deliverable is in status "historical" and is not maintained.

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";

Part 12: "Using WSDL with TTCN-3".

---

## Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.