



**Methods for Testing and Specification (MTS);  
The Testing and Test Control Notation version 3;  
Part 6: TTCN-3 Control Interface (TCI)**

*iTeh STANDARD PREVIEW  
(standards.iteh.ai)  
Full standard/standards/etsi/es/201-873-6-v4.9.1-2017-05  
https://standards.iteh.ai/catalog/standards/etsi/es/201-873-6-v4.9.1-2017-05  
4417-8c78-724d92f404d0/etsi-es-201-873-6-v4.9.1-2017-05*

---

**Reference**

RES/MTS-201873-6 T3TCI ed491

---

**Keywords**control, interface, methodology, TCI, 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/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/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.

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

# Contents

Intellectual Property Rights .....	16
Foreword.....	16
Modal verbs terminology.....	16
1 Scope .....	17
2 References .....	17
2.1 Normative references .....	17
2.2 Informative references.....	18
3 Definitions and abbreviations.....	18
3.1 Definitions.....	18
3.2 Abbreviations .....	19
4 Introduction .....	20
5 Compliance.....	20
6 General structure of a TTCN-3 test system.....	20
6.1 Entities in a TTCN-3 test system.....	20
6.1.0 Types of entities.....	20
6.1.1 Test Management and Control (TMC).....	22
6.1.1.0 Test Management and Control Entities .....	22
6.1.1.1 Test Management (TM) .....	22
6.1.1.2 Coding and Decoding (CD) .....	22
6.1.1.3 Component Handling (CH).....	22
6.1.1.4 Test Logging (TL).....	24
6.1.2 TTCN-3 Executable (TE) .....	24
6.1.3 SUT Adaptor (SA).....	24
6.1.4 Platform Adaptor (PA).....	24
6.2 Execution requirements for a TTCN-3 test system.....	24
7 TTCN-3 control interface and operations.....	24
7.1 Overview of the TCI.....	24
7.1.0 TCI role in a TTCN-3 test system.....	24
7.1.1 Correlation between TTCN-3 and TCI operation invocations.....	25
7.1.1.0 Mapping of TTCN-3 operations to TCI operations.....	25
7.1.1.1 TTCN-3 operations with TCI operation equivalent .....	25
7.1.1.2 TTCN-3 operations with TCI operation pair equivalent .....	26
7.1.1.3 TTCN-3 operations without direct TCI operation equivalent .....	27
7.1.1.3.0 Mapping of TTCN-3 operations to series of TCI operations.....	27
7.1.1.3.1 Test case stop operation.....	27
7.2 TCI data.....	27
7.2.0 Abstract data types.....	27
7.2.1 General abstract data types .....	27
7.2.1.0 Use of general abstract data types .....	27
7.2.1.1 Management.....	27
7.2.1.2 Communication .....	28
7.2.2 Abstract TTCN-3 data types and values .....	29
7.2.2.0 Definition and scope of use.....	29
7.2.2.1 Abstract TTCN-3 data types .....	29
7.2.2.2 Abstract TTCN-3 values .....	31
7.2.2.2.0 Basic rules .....	31
7.2.2.2.1 The abstract data type Value .....	32
7.2.2.2.2 The abstract data type IntegerValue .....	34
7.2.2.2.3 The abstract data type FloatValue .....	34
7.2.2.2.4 The abstract data type BooleanValue .....	35
7.2.2.2.5 The abstract data type CharstringValue .....	35
7.2.2.2.6 The abstract data type UniversalCharstringValue.....	35

7.2.2.2.7	The abstract data type BitstringValue.....	36
7.2.2.2.8	The abstract data type OctetstringValue.....	37
7.2.2.2.9	The abstract data type HexstringValue.....	38
7.2.2.2.10	The abstract data type RecordValue.....	39
7.2.2.2.11	The abstract data type RecordOfValue.....	39
7.2.2.2.12	The abstract data type UnionValue.....	41
7.2.2.2.13	The abstract data type EnumeratedValue.....	41
7.2.2.2.14	The abstract data type VerdictValue.....	41
7.2.2.2.15	The abstract data type AddressValue.....	42
7.2.2.3	Abstract TTCN-3 matching mechanisms.....	42
7.2.2.3.1	The abstract data type MatchingMechanism.....	42
7.2.2.3.2	The abstract data type MatchingList.....	42
7.2.2.3.3	The abstract data type ValueRange.....	43
7.2.2.3.4	The abstract data type CharacterPattern.....	43
7.2.2.3.5	The abstract data type MatchDecodedContent.....	44
7.2.2.4	Data types for complex TTCN-3 properties.....	44
7.2.2.4.0	Scope of use of TTCN-3 properties.....	44
7.2.2.4.1	The abstract data type LengthRestriction.....	44
7.2.2.4.2	The abstract data type Permutation.....	44
7.2.2.4.3	The abstract data type RangeBoundary.....	45
7.2.3	Abstract logging types.....	45
7.2.3.1	The abstract data type TciValueTemplate.....	45
7.2.3.2	The abstract data type TciNonValueTemplate.....	45
7.2.3.3	The Value List and Mismatch Types.....	46
7.2.3.4	The Status Types.....	46
7.3	TCI operations.....	47
7.3.0	The TCI interfaces.....	47
7.3.1	The TCI-TM interface.....	48
7.3.1.0	Scope of use.....	48
7.3.1.1	TCI-TM required.....	48
7.3.1.1.0	Scope of use.....	48
7.3.1.1.1	tciRootModule.....	48
7.3.1.1.2	tciGetImportedModules.....	49
7.3.1.1.3	tciGetModuleParameters.....	49
7.3.1.1.4	tciGetTestCases.....	49
7.3.1.1.5	tciGetTestCaseParameters.....	49
7.3.1.1.6	tciGetTestCaseTSI.....	49
7.3.1.1.7	tciStartTestCase.....	50
7.3.1.1.8	tciStopTestCase.....	50
7.3.1.1.9	tciStartControl.....	50
7.3.1.1.10	tciStopControl.....	50
7.3.1.2	TCI-TM provided.....	51
7.3.1.2.0	Scope of use.....	51
7.3.1.2.1	tciTestCaseStarted.....	51
7.3.1.2.2	tciTestCaseTerminated.....	51
7.3.1.2.3	tciControlTerminated.....	51
7.3.1.2.4	tciGetModulePar.....	51
7.3.1.2.5	tciLog.....	52
7.3.1.2.6	tciError.....	52
7.3.2	The TCI-CD interface.....	52
7.3.2.0	Scope of use.....	52
7.3.2.1	TCI-CD required.....	53
7.3.2.1.0	Scope of use.....	53
7.3.2.1.1	getTypeForName.....	53
7.3.2.1.2	getInteger.....	54
7.3.2.1.3	getFloat.....	54
7.3.2.1.4	getBoolean.....	54
7.3.2.1.5	Void.....	54
7.3.2.1.6	getCharstring.....	54
7.3.2.1.7	getUniversalCharstring.....	54

7.3.2.1.8	getHexString .....	54
7.3.2.1.9	getBitstring .....	54
7.3.2.1.10	getOctetstring .....	55
7.3.2.1.11	getVerdict .....	55
7.3.2.1.12	tciErrorReq .....	55
7.3.2.2	TCI-CD provided .....	55
7.3.2.2.0	Scope of use.....	55
7.3.2.2.1	decode.....	55
7.3.2.2.2	encode.....	55
7.3.2.2.3	decodeValue .....	56
7.3.2.2.4	encodeValue .....	56
7.3.3	The TCI-CH interface .....	56
7.3.3.0	Scope of use .....	56
7.3.3.1	TCI-CH required .....	57
7.3.3.1.0	Scope of use.....	57
7.3.3.1.1	tciEnqueueMsgConnected .....	58
7.3.3.1.2	tciEnqueueCallConnected .....	58
7.3.3.1.3	tciEnqueueReplyConnected.....	58
7.3.3.1.4	tciEnqueueRaiseConnected .....	59
7.3.3.1.5	tciCreateTestComponent .....	59
7.3.3.1.6	tciStartTestComponent .....	59
7.3.3.1.7	tciStopTestComponent .....	60
7.3.3.1.8	tciConnect.....	60
7.3.3.1.9	tciDisconnect .....	60
7.3.3.1.10	tciMap.....	60
7.3.3.1.11	tciMapParam .....	60
7.3.3.1.12	tciUnmap .....	61
7.3.3.1.13	tciUnmapParam .....	61
7.3.3.1.14	tciTestComponentTerminated .....	61
7.3.3.1.15	tciTestComponentRunning .....	61
7.3.3.1.16	tciTestComponentDone .....	61
7.3.3.1.17	tciGetMTC.....	62
7.3.3.1.18	tciExecuteTestCase.....	62
7.3.3.1.19	tciReset .....	62
7.3.3.1.20	tciKillTestComponent .....	62
7.3.3.1.21	tciTestComponentAlive.....	63
7.3.3.1.22	tciTestComponentKilled.....	63
7.3.3.2	TCI-CH provided .....	63
7.3.3.2.0	Scope of use.....	63
7.3.3.2.1	tciSendConnected.....	63
7.3.3.2.2	tciSendConnectedBC.....	63
7.3.3.2.3	tciSendConnectedMC.....	64
7.3.3.2.4	tciCallConnected .....	64
7.3.3.2.5	tciCallConnectedBC .....	64
7.3.3.2.6	tciCallConnectedMC .....	65
7.3.3.2.7	tciReplyConnected .....	65
7.3.3.2.8	tciReplyConnectedBC .....	66
7.3.3.2.9	tciReplyConnectedMC .....	66
7.3.3.2.10	tciRaiseConnected .....	67
7.3.3.2.11	tciRaiseConnectedBC.....	67
7.3.3.2.12	tciRaiseConnectedMC.....	67
7.3.3.2.13	tciCreateTestComponentReq.....	68
7.3.3.2.14	tciStartTestComponentReq.....	68
7.3.3.2.15	tciStopTestComponentReq.....	68
7.3.3.2.16	tciConnectReq .....	68
7.3.3.2.17	tciDisconnectReq.....	69
7.3.3.2.18	tciMapReq .....	69
7.3.3.2.19	tciMapParamReq .....	69
7.3.3.2.20	tciUnmapReq .....	69
7.3.3.2.21	tciUnmapParamReq.....	70
7.3.3.2.22	tciTestComponentTerminatedReq.....	70
7.3.3.2.23	tciTestComponentRunningReq .....	70

7.3.3.2.24	tciTestComponentDoneReq.....	70
7.3.3.2.25	tciGetMTCReq .....	70
7.3.3.2.26	tciExecuteTestCaseReq .....	71
7.3.3.2.27	tciResetReq.....	71
7.3.3.2.28	tciKillTestComponentReq .....	71
7.3.3.2.29	tciTestComponentAliveReq .....	71
7.3.3.2.30	tciTestComponentKilledReq .....	71
7.3.4	The TCI-TL interface.....	72
7.3.4.0	Scope of use .....	72
7.3.4.1	TCI-TL provided.....	72
7.3.4.1.0	Scope of use.....	72
7.3.4.1.1	tliTcExecute.....	72
7.3.4.1.2	tliTcStart.....	73
7.3.4.1.3	tliTcStop .....	73
7.3.4.1.4	tliTcStarted .....	73
7.3.4.1.5	tliTcTerminated .....	74
7.3.4.1.6	tliCtrlStart.....	74
7.3.4.1.7	tliCtrlStop .....	74
7.3.4.1.8	tliCtrlTerminated .....	75
7.3.4.1.9	tliMSend_m.....	75
7.3.4.1.10	tliMSend_m_BC.....	76
7.3.4.1.11	tliMSend_m_MC.....	76
7.3.4.1.12	tliMSend_c .....	77
7.3.4.1.13	tliMSend_c_BC .....	77
7.3.4.1.14	tliMSend_c_MC .....	77
7.3.4.1.15	tliMDetected_m.....	78
7.3.4.1.16	tliMDetected_c .....	78
7.3.4.1.17	tliMMismatch_m .....	78
7.3.4.1.18	tliMMismatch_c .....	79
7.3.4.1.19	tliMReceive_m .....	79
7.3.4.1.20	tliMReceive_c .....	80
7.3.4.1.21	tliPrCall_m .....	80
7.3.4.1.22	tliPrCall_m_BC .....	81
7.3.4.1.23	tliPrCall_m_MC .....	81
7.3.4.1.24	tliPrCall_c.....	82
7.3.4.1.25	tliPrCall_c_BC .....	82
7.3.4.1.26	tliPrCall_c_MC.....	82
7.3.4.1.27	tliPrGetCallDetected_m.....	83
7.3.4.1.28	tliPrGetCallDetected_c.....	83
7.3.4.1.29	tliPrGetCallMismatch_m.....	84
7.3.4.1.30	tliPrGetCallMismatch_c.....	84
7.3.4.1.31	tliPrGetCall_m.....	85
7.3.4.1.32	tliPrGetCall_c.....	85
7.3.4.1.33	tliPrReply_m .....	86
7.3.4.1.34	tliPrReply_m_BC .....	86
7.3.4.1.35	tliPrReply_m_MC .....	87
7.3.4.1.36	tliPrReply_c.....	87
7.3.4.1.37	tliPrReply_c_BC.....	88
7.3.4.1.38	tliPrReply_c_MC.....	88
7.3.4.1.39	tliPrGetReplyDetected_m.....	89
7.3.4.1.40	tliPrGetReplyDetected_c.....	89
7.3.4.1.41	tliPrGetReplyMismatch_m.....	90
7.3.4.1.42	tliPrGetReplyMismatch_c.....	90
7.3.4.1.43	tliPrGetReply_m.....	91
7.3.4.1.44	tliPrGetReply_c .....	91
7.3.4.1.45	tliPrRaise_m .....	92
7.3.4.1.46	tliPrRaise_m_BC.....	92
7.3.4.1.47	tliPrRaise_m_MC .....	93
7.3.4.1.48	tliPrRaise_c .....	93
7.3.4.1.49	tliPrRaise_c_BC .....	94
7.3.4.1.50	tliPrRaise_c_MC .....	94
7.3.4.1.51	tliPrCatchDetected_m.....	95

7.3.4.1.52	tliPrCatchDetected_c	95
7.3.4.1.53	tliPrCatchMismatch_m	96
7.3.4.1.54	tliPrCatchMismatch_c	96
7.3.4.1.55	tliPrCatch_m	97
7.3.4.1.56	tliPrCatch_c	97
7.3.4.1.57	tliPrCatchTimeoutDetected	98
7.3.4.1.58	tliPrCatchTimeout	98
7.3.4.1.59	tliCCreate	98
7.3.4.1.60	tliCStart	99
7.3.4.1.61	tliCRunning	99
7.3.4.1.62	tliCAlive	99
7.3.4.1.63	tliCStop	100
7.3.4.1.64	tliCKill	100
7.3.4.1.65	tliCDoneMismatch	100
7.3.4.1.66	tliCDone	101
7.3.4.1.67	tliCKilledMismatch	101
7.3.4.1.68	tliCKilled	101
7.3.4.1.69	tliCTerminated	102
7.3.4.1.70	tliPConnect	102
7.3.4.1.71	tliPDisconnect	102
7.3.4.1.72	tliPMap	103
7.3.4.1.73	tliPMapParam	103
7.3.4.1.74	tliPUnmap	103
7.3.4.1.75	tliPUnmapParam	104
7.3.4.1.76	tliPClear	104
7.3.4.1.77	tliPStart	104
7.3.4.1.78	tliPStop	105
7.3.4.1.79	tliPHalt	105
7.3.4.1.80	tliEncode	105
7.3.4.1.81	tliDecode	106
7.3.4.1.82	tliTTimeoutDetected	106
7.3.4.1.83	tliTTimeoutMismatch	106
7.3.4.1.84	tliTTimeout	107
7.3.4.1.85	tliTStart	107
7.3.4.1.86	tliTStop	107
7.3.4.1.87	tliTRead	108
7.3.4.1.88	tliTRunning	108
7.3.4.1.89	tliSEnter	108
7.3.4.1.90	tliSLeave	109
7.3.4.1.91	tliVar	109
7.3.4.1.92	tliModulePar	109
7.3.4.1.93	tliGetVerdict	110
7.3.4.1.94	tliSetVerdict	110
7.3.4.1.95	tliLog	110
7.3.4.1.96	tliAEnter	111
7.3.4.1.97	tliALeave	111
7.3.4.1.98	tliANomatch	111
7.3.4.1.99	tliARepeat	111
7.3.4.1.100	tliADefaults	112
7.3.4.1.101	tliAActivate	112
7.3.4.1.102	tliADeactivate	112
7.3.4.1.103	tliAWait	113
7.3.4.1.104	tliAction	113
7.3.4.1.105	tliMatch	113
7.3.4.1.106	tliMatchMismatch	113
7.3.4.1.107	tliInfo	114
7.3.4.1.108	tliMChecked_m	114
7.3.4.1.109	tliMChecked_c	114
7.3.4.1.110	tliPrGetCallChecked_m	115
7.3.4.1.111	tliPrGetCallChecked_c	115
7.3.4.1.112	tliPrGetReplyChecked_m	116
7.3.4.1.113	tliPrGetReplyChecked_c	116

7.3.4.1.114	tliPrCatchChecked_m.....	117
7.3.4.1.115	tliPrCatchChecked_c .....	117
7.3.4.1.116	tliCheckedAny_m.....	118
7.3.4.1.117	tliCheckedAny_c .....	118
7.3.4.1.118	tliCheckAnyMismatch_m.....	118
7.3.4.1.119	tliCheckAnyMismatch_c .....	119
7.3.4.1.120	tliRnd .....	119
7.3.4.1.121	tliEvaluate.....	119
8	Java™ language mapping.....	120
8.1	Introduction .....	120
8.2	Names and scopes .....	120
8.2.1	Names .....	120
8.2.2	Scopes .....	120
8.3	Type mapping.....	120
8.3.1	Basic type mapping.....	120
8.3.2	Structured type mapping .....	121
8.3.2.0	General principles .....	121
8.3.2.1	TciParameterType .....	121
8.3.2.2	TciParameterPassingModeType.....	122
8.3.2.3	TciParameterListType.....	122
8.3.2.4	TciTypeClassType .....	122
8.3.2.5	TciTestComponentKindType.....	123
8.3.2.6	TciBehaviourIdType .....	123
8.3.2.7	TciTestCaseIdType .....	123
8.3.2.8	TciModuleIdType .....	123
8.3.2.9	TciModuleParameterIdType .....	123
8.3.2.10	TciModuleParameterListType .....	124
8.3.2.11	TciModuleParameterType.....	124
8.3.2.12	TciParameterTypeListType.....	124
8.3.2.13	TciParameterTypeType.....	125
8.3.2.14	TciModuleIdListType .....	125
8.3.2.15	TciTestCaseIdListType.....	125
8.3.2.16	TciDecodingResult.....	126
8.3.2.17	TciMatchingTypeType.....	126
8.3.2.18	LengthRestriction.....	126
8.3.2.19	Permutation .....	127
8.3.2.20	RangeBoundary.....	127
8.3.3	Abstract type mapping.....	128
8.3.3.0	General principles .....	128
8.3.3.1	Type .....	128
8.3.4	Abstract value mapping .....	129
8.3.4.0	General principles .....	129
8.3.4.1	Value .....	129
8.3.4.2	IntegerValue.....	130
8.3.4.3	FloatValue .....	131
8.3.4.4	BooleanValue.....	131
8.3.4.5	CharstringValue .....	131
8.3.4.6	BitstringValue .....	132
8.3.4.7	OctetstringValue .....	133
8.3.4.8	UniversalCharstringValue .....	134
8.3.4.9	HexstringValue .....	134
8.3.4.10	RecordValue.....	135
8.3.4.11	RecordOfValue .....	135
8.3.4.12	UnionValue .....	137
8.3.4.13	EnumeratedValue.....	137
8.3.4.14	VerdictValue .....	138
8.3.4.15	AddressValue .....	138
8.3.5	Abstract template mapping .....	138
8.3.5.0	General principles .....	138
8.3.5.1	MatchingMechanism.....	138
8.3.5.2	MatchingList .....	139



8.3.5.3	ValueRange .....	139
8.3.5.4	CharacterPattern .....	139
8.3.5.5	MatchDecodedContent .....	140
8.3.6	Abstract logging types mapping .....	140
8.3.6.0	General principles .....	140
8.3.6.1	TciValueTemplate .....	140
8.3.6.2	TciNonValueTemplate .....	140
8.3.6.3	TciValueList .....	141
8.3.6.4	TciValueDifference .....	141
8.3.6.5	TciValueDifferenceList .....	141
8.3.6.6	ComponentStatus .....	142
8.3.6.7	TimerStatus .....	142
8.3.6.8	TciStatus .....	142
8.4	Constants .....	142
8.5	Mapping of interfaces .....	144
8.5.0	Calling rules .....	144
8.5.1	The TCI-TM interface .....	144
8.5.1.1	TCI-TM provided .....	144
8.5.1.2	TCI-TM required .....	145
8.5.2	The TCI-CD interface .....	145
8.5.2.1	TCI-CD provided .....	145
8.5.2.2	TCI-CD required .....	145
8.5.3	The TCI-CH interface .....	145
8.5.3.1	TCI-CH provided .....	145
8.5.3.2	TCI-CH required .....	147
8.5.4	The TCI-TL interface .....	148
8.5.4.1	TCI-TL provided .....	148
8.6	Optional parameters .....	152
8.7	TCI initialization .....	152
8.8	Error handling .....	152
9	ANSI C language mapping .....	153
9.1	Introduction .....	153
9.2	Value interfaces .....	153
9.3	Logging interface .....	159
9.4	Operation interfaces .....	159
9.4.1	The TCI-TM interface .....	159
9.4.1.1	TCI-TM provided .....	159
9.4.1.2	TCI-TM required .....	160
9.4.2	The TCI-CD interface .....	160
9.4.2.1	TCI-CD provided .....	160
9.4.2.2	TCI-CD required .....	160
9.4.3	The TCI-CH interface .....	160
9.4.3.1	TCI-CH provided .....	160
9.4.3.2	TCI-CH required .....	161
9.4.4	The TCI-TL interface .....	162
9.4.4.1	TCI-TL provided .....	162
9.5	Data .....	167
9.6	Miscellaneous .....	168
9.7	Optional parameters .....	169
10	C++ language mapping .....	169
10.1	Introduction .....	169
10.2	Names and scopes .....	169
10.3	Memory management .....	170
10.4	Error handling .....	170
10.5	Type mapping .....	170
10.5.0	Basic concepts .....	170
10.5.1	Encapsulated C++ types .....	170
10.5.2	General abstract data types .....	170
10.5.2.1	TciBehaviourId .....	170
10.5.2.2	TciModuleId .....	171

10.5.2.3	TciModuleParameterId .....	171
10.5.2.4	TciTestCaseId .....	171
10.5.2.5	TciModuleIdList .....	172
10.5.2.6	TciModuleParameter .....	172
10.5.2.7	TciModuleParameterList .....	173
10.5.2.8	TciParameterPassingMode .....	173
10.5.2.9	TciParameter .....	174
10.5.2.10	TciParameterList .....	174
10.5.2.11	TciParameterType .....	175
10.5.2.12	TciParameterTypeList .....	175
10.5.2.13	TciTestComponentKind .....	176
10.5.2.14	TciTypeClass .....	176
10.5.2.15	TciTestCaseIdList .....	176
10.5.2.16	TciMatchingTypeType .....	177
10.5.2.17	LengthRestriction .....	177
10.5.2.18	Permutation .....	178
10.5.2.19	RangeBoundary .....	178
10.5.3	Abstract TTCN-3 data types and values .....	179
10.5.3.1	TciType .....	179
10.5.3.2	TciValue .....	180
10.5.3.3	IntegerValue .....	181
10.5.3.4	FloatValue .....	182
10.5.3.5	BooleanValue .....	182
10.5.3.6	CharstringValue .....	183
10.5.3.7	UniversalCharstringValue .....	183
10.5.3.8	BitstringValue .....	184
10.5.3.9	OctetstringValue .....	184
10.5.3.10	HexstringValue .....	185
10.5.3.11	RecordValue .....	186
10.5.3.12	RecordOfValue .....	186
10.5.3.13	UnionValue .....	187
10.5.3.14	EnumeratedValue .....	188
10.5.3.15	VerdictValue .....	188
10.5.3.16	VerdictValueEnum .....	189
10.5.3.17	AddressValue .....	189
10.5.3.18	MatchingMechanism .....	189
10.5.3.19	MatchingList .....	190
10.5.3.20	ValueRange .....	190
10.5.3.21	CharacterPattern .....	191
10.5.3.22	MatchDecodedContent .....	191
10.5.4	Abstract logging types .....	192
10.5.4.1	TciValueTemplate .....	192
10.5.4.2	TciNonValueTemplate .....	192
10.5.4.3	TciValueList .....	193
10.5.4.4	TciValueDifference .....	193
10.5.4.5	TciValueDifferenceList .....	194
10.5.4.6	ComponentStatus .....	194
10.5.4.7	TimerStatus .....	194
10.5.4.8	TciStatus .....	195
10.6	Operations mapping .....	195
10.6.1	TCI-TM .....	195
10.6.1.1	TciTmRequired .....	195
10.6.1.2	TciTmProvided .....	195
10.6.2	TCI-CD .....	196
10.6.2.1	TciCdRequired .....	196
10.6.2.2	TciCdProvided .....	196
10.6.3	TCI-CH .....	197
10.6.3.1	TciChRequired .....	197
10.6.3.2	TciChProvided .....	198
10.6.4	TCI-TL .....	200
10.6.4.1	TciTIProvided .....	200

11	W3C XML mapping.....	208
11.1	Introduction .....	208
11.2	Scopes .....	208
11.3	Type mapping.....	208
11.3.1	Mapping of simple types.....	208
11.3.1.1	TBoolean.....	208
11.3.1.2	TString .....	208
11.3.1.3	TInteger .....	209
11.3.1.4	TriTimerDurationType.....	209
11.3.1.5	TciParameterPassingModeType.....	209
11.3.1.6	TriStatusType.....	209
11.3.1.7	TciStatusType .....	209
11.3.1.8	ComponentStatusType .....	209
11.3.1.9	TimerStatusType .....	209
11.3.1.10	PortStatusType .....	209
11.3.2	Complex type mapping .....	209
11.3.2.1	TriPortIdType.....	209
11.3.2.2	TriComponentIdType.....	210
11.3.2.3	TriComponentIdListType .....	210
11.3.2.4	Port.....	210
11.3.2.5	Id .....	211
11.3.2.6	TriMessageType.....	211
11.3.2.7	TriParameterType .....	211
11.3.2.8	TriParameterListType .....	212
11.3.2.9	TriAddressType .....	212
11.3.2.10	TriAddressListType .....	212
11.3.2.11	TriExceptionType .....	213
11.3.2.12	TriSignatureIdType .....	213
11.3.2.13	TriTimerIdType .....	213
11.3.2.14	TriTimerDurationType.....	213
11.3.2.15	QualifiedName .....	214
11.3.2.16	TciBehaviourIdType .....	214
11.3.2.17	TciTestCaseIdType .....	214
11.3.2.18	TciParameterType .....	214
11.3.2.19	TciParameterListType.....	215
11.3.2.20	TriPortIdListType .....	215
11.3.3	Abstract value mapping .....	215
11.3.3.1	Value .....	215
11.3.3.2	IntegerValue .....	217
11.3.3.3	FloatValue .....	217
11.3.3.4	BooleanValue.....	218
11.3.3.5	Void.....	218
11.3.3.6	VerdictValue .....	218
11.3.3.7	BitstringValue .....	219
11.3.3.8	HexstringValue .....	219
11.3.3.9	OctetstringValue .....	220
11.3.3.10	CharstringValue .....	220
11.3.3.11	UniversalCharstringValue.....	220
11.3.3.12	RecordValue.....	221
11.3.3.13	RecordOfValue .....	222
11.3.3.14	ArrayValue.....	224
11.3.3.15	SetValue .....	225
11.3.3.16	SetOfValue.....	227
11.3.3.17	EnumeratedValue.....	228
11.3.3.18	UnionValue .....	229
11.3.3.19	AnytypeValue .....	230
11.3.3.20	AddressValue .....	231
11.3.3.21	ComponentValue .....	232
11.3.3.22	PortValue .....	233
11.3.3.23	DefaultValue .....	233
11.3.3.24	TimerValue .....	234
11.3.4	Abstract logging types mapping .....	234

11.3.4.1	TciValueTemplate.....	234
11.3.4.2	TciNonValueTemplate.....	235
11.3.4.3	TciValueList.....	236
11.3.4.4	TciValueDifference.....	236
11.3.4.5	TciValueDifferenceList.....	237
11.4	Mapping of the operations on the logging interface.....	237
11.4.0	Mapping rules.....	237
11.4.1	Event.....	237
11.4.2	The TCI-TL interface.....	238
11.4.2.1	TCI-TL provided.....	238
12	C# mapping.....	259
12.1	Introduction.....	259
12.2	Names and scopes.....	259
12.2.1	Names.....	259
12.2.2	Scopes.....	259
12.3	Null value mapping.....	259
12.4	Type mapping.....	259
12.4.1	Basic type mapping.....	259
12.4.1.0	Mapped types.....	259
12.4.1.1	TciVerdict.....	260
12.4.2	Structured type mapping.....	260
12.4.2.0	Mapping rules.....	260
12.4.2.1	TciParameterPassingModeType.....	260
12.4.2.2	TciParameterType.....	261
12.4.2.3	TciParameterListType.....	261
12.4.2.4	TciTypeClassType.....	261
12.4.2.5	TciTestComponentKindType.....	262
12.4.2.6	TciBehaviourIdType.....	262
12.4.2.7	TciTestCaseIdType.....	262
12.4.2.8	TciTestCaseIdListType.....	262
12.4.2.9	TciModuleIdType.....	263
12.4.2.10	TciModuleIdListType.....	263
12.4.2.11	TciModuleParameterIdType.....	263
12.4.2.12	TciModuleParameterType.....	263
12.4.2.13	TciModuleParameterListType.....	263
12.4.2.14	TciParameterTypeType.....	264
12.4.2.15	TciParameterTypeListType.....	264
12.4.2.16	TciMatchingTypeType.....	265
12.4.2.17	LengthRestriction.....	265
12.4.2.18	Permutation.....	265
12.4.2.19	RangeBoundary.....	265
12.4.3	Abstract type mapping.....	266
12.4.3.0	Mapping rules.....	266
12.4.3.1	Type.....	266
12.4.4	Abstract value mapping.....	267
12.4.4.0	Mapping rules.....	267
12.4.4.1	Value.....	267
12.4.4.2	IntegerValue.....	269
12.4.4.3	FloatValue.....	269
12.4.4.4	BooleanValue.....	269
12.4.4.5	CharstringValue.....	269
12.4.4.6	BitstringValue.....	270
12.4.4.7	OctetstringValue.....	271
12.4.4.8	UniversalCharstringValue.....	271
12.4.4.9	HexstringValue.....	272
12.4.4.10	RecordValue.....	272
12.4.4.11	RecordOfValue.....	273
12.4.4.12	UnionValue.....	274
12.4.4.13	EnumeratedValue.....	275
12.4.4.14	VerdictValue.....	275
12.4.4.15	AddressValue.....	275

12.4.5	Abstract template mapping .....	275
12.4.5.0	Mapping rules .....	275
12.4.5.1	MatchingMechanism.....	275
12.4.5.2	MatchingList .....	276
12.4.5.3	ValueRange .....	276
12.4.5.4	CharacterPattern.....	276
12.4.5.5	MatchDecodedContent.....	277
12.4.6	Abstract logging types mapping .....	277
12.4.6.0	Mapping rules .....	277
12.4.6.1	TciValueTemplate.....	277
12.4.6.2	TciNonValueTemplate.....	277
12.4.6.3	TciValueList.....	278
12.4.6.4	TciValueDifference.....	278
12.4.6.5	TciValueDifferenceList.....	278
12.4.6.6	TciStatusType .....	279
12.4.6.7	ComponentStatusType.....	279
12.4.6.8	TimerStatusType .....	279
12.5	Mapping of interfaces.....	279
12.5.0	Calling rules.....	279
12.5.1	TCI-TM interface.....	280
12.5.1.1	TCI-TM provided.....	280
12.5.1.2	TCI-TM required.....	280
12.5.2	TCI-CD interface .....	280
12.5.2.1	TCI-CD provided .....	280
12.5.2.2	TCI-CD required .....	281
12.5.3	TCI-CH interface .....	281
12.5.3.1	TCI-CH provided.....	281
12.5.3.2	TCI-CH required.....	282
12.5.4	TCI-TL interface.....	283
12.5.4.1	TCI-TL provided.....	283
12.6	Optional parameters .....	289
12.7	Error Handling.....	289
<b>Annex A (normative):</b>	<b>IDL Specification of TCI.....</b>	<b>290</b>
<b>Annex B (normative):</b>	<b>XML Mapping for TCI TL Provided.....</b>	<b>308</b>
B.0	Introduction .....	308
B.1	TCI-TL XML Schema for Simple Types.....	308
B.2	TCI-TL XML Schema for Types .....	309
B.3	TCI-TL XML Schema for Values .....	311
B.4	TCI-TL XML Schema for Templates .....	318
B.5	TCI-TL XML Schema for Events .....	325
B.6	TCI-TL XML Schema for a Log.....	347
<b>Annex C (informative):</b>	<b>Use scenarios .....</b>	<b>351</b>
C.0	Introduction .....	351
C.1	Initialization, collecting information, logging.....	351
C.1.1	Use scenario: initialization .....	351
C.1.1.0	Scenario description.....	351
C.1.1.1	Sequence diagram.....	352
C.1.1.2	TTCN-3 fragment .....	352
C.1.2	Use scenario: requesting module parameters .....	352
C.1.2.0	Scenario description.....	352
C.1.2.1	Sequence diagram.....	353
C.1.2.2	TTCN-3 fragment .....	353
C.1.3	Use scenario: logging.....	353