



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

iTeh STANDARDS PREVIEW  
(Standards.iTech.ai)  
Full standard  
<https://standards.itech.ai/catalog/standards/standard/44-2ac&457e-87cd-c900de037d04/etsi-es-201-873-6-v4.10.1-2018-05>

---

Reference

RES/MTS-201873-6T3TCled4A1

---

Keywordscontrol, 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/CommitteeSupportStaff.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.

© ETSI 2018.  
All rights reserved.

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 protected for the benefit of its Members.  
GSM® and the GSM logo are trademarks 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) .....                                   | 23 |
| 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 .....                     | 35 |
| 7.2.2.2.3 The abstract data type FloatValue .....                       | 35 |
| 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 ..... | 36 |
| 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 TciValueTypeTemplate .....     | 45 |
| 7.2.3.2    | The abstract data type TciNonValueTypeTemplate .....  | 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 .....                                 | 52 |
| 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  | tliIMSend_m .....                | 75 |
| 7.3.4.1.10 | tliIMSend_m_BC .....             | 76 |
| 7.3.4.1.11 | tliIMSend_m_MC .....             | 76 |
| 7.3.4.1.12 | tliIMSend_c .....                | 77 |
| 7.3.4.1.13 | tliIMSend_c_BC .....             | 77 |
| 7.3.4.1.14 | tliIMSend_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  | tliTTTimeoutDetected .....      | 106 |
| 7.3.4.1.83  | tliTTTimeoutMismatch .....      | 106 |
| 7.3.4.1.84  | tliTTTimeout .....              | 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  | tliAReset .....                 | 111 |
| 7.3.4.1.100 | tliADefaults .....              | 112 |
| 7.3.4.1.101 | tliAAActivate .....             | 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 | tlPrGetReplyChecked_c .....      | 116 |
| 7.3.4.1.114 | tlPrCatchChecked_m.....          | 117 |
| 7.3.4.1.115 | tlPrCatchChecked_c .....         | 117 |
| 7.3.4.1.116 | tlCheckedAny_m.....              | 118 |
| 7.3.4.1.117 | tlCheckedAny_c .....             | 118 |
| 7.3.4.1.118 | tlCheckAnyMismatch_m.....        | 118 |
| 7.3.4.1.119 | tlCheckAnyMismatch_c .....       | 119 |
| 7.3.4.1.120 | tlRnd.....                       | 119 |
| 7.3.4.1.121 | tlEvaluate.....                  | 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 .....              | 158 |
| 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 .....                | 159 |
| 9.4.2    | The TCI-CD interface .....           | 159 |
| 9.4.2.1  | TCI-CD provided .....                | 159 |
| 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 .....           | 161 |
| 9.4.4.1  | TCI-TL provided .....                | 161 |
| 9.5      | Data .....                           | 166 |
| 9.6      | Miscellaneous .....                  | 168 |
| 9.7      | Optional parameters .....            | 168 |
| 10       | C++ language mapping .....           | 169 |
| 10.1     | Introduction .....                   | 169 |
| 10.2     | Names and scopes .....               | 169 |
| 10.3     | Memory management .....              | 169 |
| 10.4     | Error handling .....                 | 169 |
| 10.5     | Type mapping .....                   | 169 |
| 10.5.0   | Basic concepts .....                 | 169 |
| 10.5.1   | Encapsulated C++ types .....         | 169 |
| 10.5.2   | General abstract data types .....    | 170 |
| 10.5.2.1 | TciBehaviourId .....                 | 170 |

|           |   |     |
|-----------|---|-----|
| 10.5.2.2  | TciModuleId.....                            | 170 |
| 10.5.2.3  | TciModuleParameterId .....                  | 170 |
| 10.5.2.4  | TciTestCaseId .....                         | 171 |
| 10.5.2.5  | TciModuleIdList .....                       | 171 |
| 10.5.2.6  | TciModuleParameter.....                     | 172 |
| 10.5.2.7  | TciModuleParameterList.....                 | 172 |
| 10.5.2.8  | TciParameterPassingMode.....                | 173 |
| 10.5.2.9  | TciParameter .....                          | 173 |
| 10.5.2.10 | TciParameterList .....                      | 173 |
| 10.5.2.11 | TciParameterType .....                      | 174 |
| 10.5.2.12 | TciParameterTypeList.....                   | 174 |
| 10.5.2.13 | TciTestComponentKind .....                  | 175 |
| 10.5.2.14 | TciTypeClass .....                          | 175 |
| 10.5.2.15 | TciTestCaseIdList .....                     | 176 |
| 10.5.2.16 | TciMatchingTypeType.....                    | 176 |
| 10.5.2.17 | LengthRestriction.....                      | 176 |
| 10.5.2.18 | Permutation .....                           | 177 |
| 10.5.2.19 | RangeBoundary.....                          | 178 |
| 10.5.3    | Abstract TTCN-3 data types and values ..... | 178 |
| 10.5.3.1  | TciType .....                               | 178 |
| 10.5.3.2  | TciValue .....                              | 179 |
| 10.5.3.3  | IntegerValue .....                          | 181 |
| 10.5.3.4  | FloatingValue .....                         | 181 |
| 10.5.3.5  | BooleanValue .....                          | 181 |
| 10.5.3.6  | CharstringValue .....                       | 182 |
| 10.5.3.7  | UniversalCharstringValue .....              | 182 |
| 10.5.3.8  | BitstringValue .....                        | 183 |
| 10.5.3.9  | OctetstringValue .....                      | 184 |
| 10.5.3.10 | HexstringValue .....                        | 184 |
| 10.5.3.11 | RecordValue.....                            | 185 |
| 10.5.3.12 | RecordOfValue .....                         | 186 |
| 10.5.3.13 | UnionValue .....                            | 187 |
| 10.5.3.14 | EnumeratedValue .....                       | 187 |
| 10.5.3.15 | VerdictValue .....                          | 188 |
| 10.5.3.16 | VerdictValueEnum .....                      | 188 |
| 10.5.3.17 | AddressValue .....                          | 188 |
| 10.5.3.18 | MatchingMechanism .....                     | 189 |
| 10.5.3.19 | MatchingList .....                          | 189 |
| 10.5.3.20 | ValueRange .....                            | 190 |
| 10.5.3.21 | CharacterPattern.....                       | 190 |
| 10.5.3.22 | MatchDecodedContent .....                   | 191 |
| 10.5.4    | Abstract logging types .....                | 191 |
| 10.5.4.1  | TciValueTemplate .....                      | 191 |
| 10.5.4.2  | TciNonValueTemplate .....                   | 192 |
| 10.5.4.3  | TciValueList .....                          | 192 |
| 10.5.4.4  | TciValueDifference .....                    | 193 |
| 10.5.4.5  | TciValueDifferenceList .....                | 193 |
| 10.5.4.6  | ComponentStatus .....                       | 194 |
| 10.5.4.7  | TimerStatus .....                           | 194 |
| 10.5.4.8  | TciStatus .....                             | 194 |
| 10.6      | Operations mapping .....                    | 194 |
| 10.6.1    | TCI-TM .....                                | 194 |
| 10.6.1.1  | TciTmRequired .....                         | 194 |
| 10.6.1.2  | TciTmProvided .....                         | 195 |
| 10.6.2    | TCI-CD .....                                | 195 |
| 10.6.2.1  | TciCdRequired .....                         | 195 |
| 10.6.2.2  | TciCdProvided .....                         | 196 |
| 10.6.3    | TCI-CH .....                                | 196 |
| 10.6.3.1  | TciChRequired .....                         | 196 |
| 10.6.3.2  | TciChProvided .....                         | 197 |
| 10.6.4    | TCI-TL.....                                 | 199 |
| 10.6.4.1  | TciTlProvided .....                         | 199 |

|           |                                  |     |
|-----------|----------------------------------|-----|
| 11        | W3C XML mapping.....             | 207 |
| 11.1      | Introduction .....               | 207 |
| 11.2      | Scopes .....                     | 207 |
| 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.....                    | 208 |
| 11.3.1.4  | TriTimerDurationType.....        | 208 |
| 11.3.1.5  | TciParameterPassingModeType..... | 208 |
| 11.3.1.6  | TriStatusType.....               | 208 |
| 11.3.1.7  | TciStatusType .....              | 208 |
| 11.3.1.8  | ComponentStatusType .....        | 208 |
| 11.3.1.9  | TimerStatusType .....            | 208 |
| 11.3.1.10 | PortStatusType .....             | 209 |
| 11.3.2    | Complex type mapping.....        | 209 |
| 11.3.2.1  | TriPortIdType.....               | 209 |
| 11.3.2.2  | TriComponentIdType.....          | 209 |
| 11.3.2.3  | TriComponentIdListType .....     | 209 |
| 11.3.2.4  | Port.....                        | 210 |
| 11.3.2.5  | Id .....                         | 210 |
| 11.3.2.6  | TriMessageType.....              | 210 |
| 11.3.2.7  | TriParameterType .....           | 211 |
| 11.3.2.8  | TriParameterListType .....       | 211 |
| 11.3.2.9  | TriAddressType .....             | 211 |
| 11.3.2.10 | TriAddressListType .....         | 212 |
| 11.3.2.11 | TriExceptionType .....           | 212 |
| 11.3.2.12 | TriSignatureIdType .....         | 212 |
| 11.3.2.13 | TriTimerIdType .....             | 213 |
| 11.3.2.14 | TriTimerDurationType.....        | 213 |
| 11.3.2.15 | QualifiedName .....              | 213 |
| 11.3.2.16 | TciBehaviourIdType .....         | 213 |
| 11.3.2.17 | TciTestCaseIdType .....          | 214 |
| 11.3.2.18 | TciParameterType .....           | 214 |
| 11.3.2.19 | TciParameterListType .....       | 214 |
| 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 .....             | 218 |
| 11.3.3.8  | HexstringValue .....             | 218 |
| 11.3.3.9  | OctetstringValue .....           | 219 |
| 11.3.3.10 | CharstringValue .....            | 219 |
| 11.3.3.11 | UniversalCharstringValue .....   | 219 |
| 11.3.3.12 | RecordValue.....                 | 219 |
| 11.3.3.13 | RecordOfValue .....              | 220 |
| 11.3.3.14 | ArrayValue .....                 | 222 |
| 11.3.3.15 | SetValue .....                   | 222 |
| 11.3.3.16 | SetOfValue .....                 | 222 |
| 11.3.3.17 | EnumeratedValue .....            | 223 |
| 11.3.3.18 | UnionValue .....                 | 223 |
| 11.3.3.19 | AnytypeValue .....               | 223 |
| 11.3.3.20 | AddressValue .....               | 224 |
| 11.3.3.21 | ComponentValue .....             | 224 |
| 11.3.3.22 | PortValue .....                  | 224 |
| 11.3.3.23 | DefaultValue .....               | 225 |
| 11.3.3.24 | TimerValue .....                 | 225 |
| 11.3.3.25 | MatchingMechanism .....          | 226 |

|           |  |     |
|-----------|--|-----|
| 11.3.3.26 | MatchingList .....                                       | 226 |
| 11.3.3.27 | ValueRange .....   | 227 |
| 11.3.3.28 | CharacterPattern .....                                   | 227 |
| 11.3.3.29 | MatchDecodedContent .....                                | 227 |
| 11.3.4    | Abstract logging types mapping .....                     | 228 |
| 11.3.4.1  | TciValueTemplate .....                                   | 228 |
| 11.3.4.2  | TciNonValueTemplate .....                                | 229 |
| 11.3.4.3  | TciValueList .....                                       | 230 |
| 11.3.4.4  | TciValueDifference .....                                 | 230 |
| 11.3.4.5  | TciValueDifferenceList .....                             | 230 |
| 11.4      | Mapping of the operations on the logging interface ..... | 231 |
| 11.4.0    | Mapping rules .....                                      | 231 |
| 11.4.1    | Event .....  | 231 |
| 11.4.2    | The TCI-TL interface .....                               | 231 |
| 11.4.2.1  | TCI-TL provided .....                                    | 231 |
| 12        | C# mapping .....   | 253 |
| 12.1      | Introduction .....                                       | 253 |
| 12.2      | Names and scopes .....                                   | 253 |
| 12.2.1    | Names .....  | 253 |
| 12.2.2    | Scopes .....   | 253 |
| 12.3      | Null value mapping .....                                 | 253 |
| 12.4      | Type mapping .....                                       | 253 |
| 12.4.1    | Basic type mapping .....                                 | 253 |
| 12.4.1.0  | Mapped types .....                                       | 253 |
| 12.4.1.1  | TciVerdict .....   | 254 |
| 12.4.2    | Structured type mapping .....                            | 254 |
| 12.4.2.0  | Mapping rules .....                                      | 254 |
| 12.4.2.1  | TciParameterPassingModeType .....                        | 254 |
| 12.4.2.2  | TciParameterType .....                                   | 255 |
| 12.4.2.3  | TciParameterListType .....                               | 255 |
| 12.4.2.4  | TciTypeClassType .....                                   | 255 |
| 12.4.2.5  | TciTestComponentKindType .....                           | 256 |
| 12.4.2.6  | TciBehaviourIdType .....                                 | 256 |
| 12.4.2.7  | TciTestCaseIdType .....                                  | 256 |
| 12.4.2.8  | TciTestCaseIdListType .....                              | 256 |
| 12.4.2.9  | TciModuleIdType .....                                    | 257 |
| 12.4.2.10 | TciModuleIdListType .....                                | 257 |
| 12.4.2.11 | TciModuleParameterIdType .....                           | 257 |
| 12.4.2.12 | TciModuleParameterType .....                             | 257 |
| 12.4.2.13 | TciModuleParameterListType .....                         | 257 |
| 12.4.2.14 | TciParameterTypeType .....                               | 258 |
| 12.4.2.15 | TciParameterTypeListType .....                           | 258 |
| 12.4.2.16 | TciMatchingTypeType .....                                | 259 |
| 12.4.2.17 | LengthRestriction .....                                  | 259 |
| 12.4.2.18 | Permutation .....  | 259 |
| 12.4.2.19 | RangeBoundary .....                                      | 259 |
| 12.4.3    | Abstract type mapping .....                              | 260 |
| 12.4.3.0  | Mapping rules .....                                      | 260 |
| 12.4.3.1  | Type .....   | 260 |
| 12.4.4    | Abstract value mapping .....                             | 261 |
| 12.4.4.0  | Mapping rules .....                                      | 261 |
| 12.4.4.1  | Value .....  | 261 |
| 12.4.4.2  | IntegerValue .....                                       | 263 |
| 12.4.4.3  | FloatValue .....   | 263 |
| 12.4.4.4  | BooleanValue .....                                       | 263 |
| 12.4.4.5  | CharstringValue .....                                    | 263 |
| 12.4.4.6  | BitstringValue .....                                     | 264 |
| 12.4.4.7  | OctetstringValue .....                                   | 265 |
| 12.4.4.8  | UniversalCharstringValue .....                           | 265 |
| 12.4.4.9  | HexstringValue .....                                     | 266 |
| 12.4.4.10 | RecordValue .....  | 266 |

|                               |   |            |
|-------------------------------|---|------------|
| 12.4.4.11                     | RecordOfValue .....                                   | 267        |
| 12.4.4.12                     | UnionValue .....                                      | 268        |
| 12.4.4.13                     | EnumeratedValue .....                                 | 269        |
| 12.4.4.14                     | VerdictValue .....                                    | 269        |
| 12.4.4.15                     | AddressValue .....                                    | 269        |
| 12.4.5                        | Abstract template mapping .....                       | 269        |
| 12.4.5.0                      | Mapping rules .....                                   | 269        |
| 12.4.5.1                      | MatchingMechanism .....                               | 269        |
| 12.4.5.2                      | MatchingList .....                                    | 270        |
| 12.4.5.3                      | ValueRange .....                                      | 270        |
| 12.4.5.4                      | CharacterPattern .....                                | 270        |
| 12.4.5.5                      | MatchDecodedContent .....                             | 271        |
| 12.4.6                        | Abstract logging types mapping .....                  | 271        |
| 12.4.6.0                      | Mapping rules .....                                   | 271        |
| 12.4.6.1                      | TciValueTemplate .....                                | 271        |
| 12.4.6.2                      | TciNonValueTemplate .....                             | 271        |
| 12.4.6.3                      | TciValueList .....                                    | 272        |
| 12.4.6.4                      | TciValueDifference .....                              | 272        |
| 12.4.6.5                      | TciValueDifferenceList .....                          | 272        |
| 12.4.6.6                      | TciStatusType .....                                   | 273        |
| 12.4.6.7                      | ComponentStatusType .....                             | 273        |
| 12.4.6.8                      | TimerStatusType .....                                 | 273        |
| 12.5                          | Mapping of interfaces .....                           | 273        |
| 12.5.0                        | Calling rules .....                                   | 273        |
| 12.5.1                        | TCI-TM interface .....                                | 274        |
| 12.5.1.1                      | TCI-TM provided .....                                 | 274        |
| 12.5.1.2                      | TCI-TM required .....                                 | 274        |
| 12.5.2                        | TCI-CD interface .....                                | 274        |
| 12.5.2.1                      | TCI-CD provided .....                                 | 274        |
| 12.5.2.2                      | TCI-CD required .....                                 | 275        |
| 12.5.3                        | TCI-CH interface .....                                | 275        |
| 12.5.3.1                      | TCI-CH provided .....                                 | 275        |
| 12.5.3.2                      | TCI-CH required .....                                 | 276        |
| 12.5.4                        | TCI-TL interface .....                                | 277        |
| 12.5.4.1                      | TCI-TL provided .....                                 | 277        |
| 12.6                          | Optional parameters .....                             | 283        |
| 12.7                          | Error Handling .....                                  | 283        |
| <b>Annex A (normative):</b>   | <b>IDL Specification of TCI .....</b>                 | <b>284</b> |
| <b>Annex B (normative):</b>   | <b>XML Mapping for TCI TL Provided .....</b>          | <b>302</b> |
| B.0                           | Introduction .....                                    | 302        |
| B.1                           | TCI-TL XML Schema for Simple Types .....              | 302        |
| B.2                           | TCI-TL XML Schema for Types .....                     | 303        |
| B.3                           | TCI-TL XML Schema for Values .....                    | 305        |
| B.4                           | TCI-TL XML Schema for Templates .....                 | 309        |
| B.5                           | TCI-TL XML Schema for Events .....                    | 312        |
| B.6                           | TCI-TL XML Schema for a Log .....                     | 334        |
| <b>Annex C (informative):</b> | <b>Use scenarios .....</b>                            | <b>338</b> |
| C.0                           | Introduction .....                                    | 338        |
| C.1                           | Initialization, collecting information, logging ..... | 338        |
| C.1.1                         | Use scenario: initialization .....                    | 338        |
| C.1.1.0                       | Scenario description .....                            | 338        |
| C.1.1.1                       | Sequence diagram .....                                | 339        |
| C.1.1.2                       | TTCN-3 fragment .....                                 | 339        |