

TLN WRO Certification type Document

< Certification procedures for HFC and Euro-Docsis 3.0 layer connection of AO Euro-Docsis 3.0 equipment to the TLN network >



Document Housekeeping

Document Category and type

| CAT | TYPE | DOC ID | Comment |
|-----------|------|---------------------|---|
| Broadband | CERT | TLN-WRO-TA-B-C-PAAB | Certification type documents (-CERT) describe the certification process and methodology (so not the interfaces or protocols, those are found in the specification type documents) |

Document Authorization

| EDITION | DATE | APPRAISAL AUTHORITY | STATUS | ORIGINATOR |
|---------|------------|------------------------|--------|---------------------|
| 0.5 | 21.09.2012 | Director TLN Wholesale | Draft | TLN WRO Engineering |

Document Maturity State

| EDITION | DATE | APPRAISAL AUTHORITY | STATUS | ORIGINATOR |
|---------|------------|------------------------|------------------|---------------------|
| 0.5 | 21.09.2012 | Director TLN Wholesale | Draft(PD) | TLN WRO Engineering |
| 0.9 | xx.xx.2012 | Director TLN Wholesale | Final Submit(FS) | TLN WRO Engineering |
| 1.0 | xx.xx.2012 | Director TLN Wholesale | Approval(AP) | TLN WRO Engineering |

Document Effective Date

This document has come into effect as of xx/xx/2012 and remains valid until a valid subsequent Telenet Wholesale Reference offer, substituting this document is published.

Legal Disclaimer

"This document constitutes an integral part of the Telenet Reference Offer for Basic TV / IDTV / BB and should be fully complied with by the Beneficiary at all times. Non compliance, incomplete or deviating application of this document by the Beneficiary, or his authorized agent, results in the suspension and ultimately termination of the Contract between Telenet and the Beneficiary.

At any time this document is susceptible to change by Telenet, Regulator's decision or by decision of a relevant judicial authority. Changes to this document will, depending on the circumstances for change, be appropriately notified to the Beneficiary and published on the Telenet website.

Telenet has appealed the CRC decisions of the VRM, BIPT and CSA of 1 July 2011 concerning the market analysis of the broadcasting market in Belgium and it consequently reserves all its rights in relation to this document."

Table of Contents

| | | |
|-----|--|---|
| 1 | Abstract | 4 |
| 2 | Test Specifications for the certification procedures for HFC and Euro-Docsis 3.0 layer connection of AO Euro-Docsis 3.0 equipment to the TLN network | 5 |
| 2.1 | INTRODUCTION | 5 |
| 2.2 | TEST LIST | 5 |
| 2.3 | TEST SCORE CARD..... | 6 |

Table of Figures

None

List of Appendixes

This document may refer to further detailed documents that are added in Appendixes to this document.

A reference to an appendix is in this document highlighted with grey background.

The list with appendixes of this document:

- A. Appendix A, < APP-B-C-PAAB-A > contains :
- 1) Appendix A1 - <Test List>

List of References

This document may refer to external documents or information sources.

A reference to an external document or information source is in this document highlighted with grey background.

The list of referred external documents or information sources in this document:

Reference 1: TLN WRO CAT: Broadband: TLN_WRO-TA-B-S-PAAB

Reference 2: TLN WRO CAT: General: TLN-WRO-TA-G-C-PDAA

Restricted information

This document may contain sections that are not public information and that can be made available only to parties that have executed specific NDA's.

Information that is subject to NDA is marked in this document as follows:

NDA
NDA

The information in this text box is available only under NDA

Before conversion to PDF format for publication of the document, the information will be made unreadable by converting the background of the text box to black.

1 Abstract

Certification type documents have as purpose to describe the roles and responsibilities in the certification process of Telenet and the AO, the test procedures and the interaction between TLN and AO throughout the product lifecycle of AO Customer Premises Equipment (CPE) with as main goal to ensure at any moment in time correct interoperability between the AO CPE and TLN infrastructure according to the relevant specifications. The same types of certification documents and procedures are also applicable for TLN network to AO network level of interconnections.

Generic sections specifying certification procedures applicable to all AO CPE or network equipment that will be connected to the TLN network are described in General Certification Procedures Document [TLN-WRO-TA-G-C-PDAA](#).

Section 2 defines the specific test set applicable to the AO CPE or network equipment which is the subject of this specific document.

The feasibility of the technical designs and methods described in this document are subject to verification by a Proof of Concept (POC) test organized by Telenet and may be changed or updated depending on the outcome of this POC.

2 Test Specifications for the certification procedures for HFC and Euro-Docsis 3.0 layer connection of AO Euro-Docsis 3.0 equipment to the TLN network

2.1 Introduction

- (1) The tests will cover all of the requirements specified by TLN in the specification document with identification **TLN_WRO_TA_B_C_PAAB**.

2.2 Test list

- (2) The test list for this AO equipment is included in **Appendix A1** to this document

2.3 Test score card

| CONFORMANCE TEST SCORE CARD | | | | | |
|--|--|----------|-------|-----------|-------|
| Conformance Test Score Card Number | TLN-WRO-TA-TSC-%-P%%% | | | | |
| Test Identification | | | | | |
| Test Execution Date | | | | | |
| Test Run Type | Full / Reduced(without OOS cases) | | | | |
| Device / Equipment / Interface Name | | | | | |
| Device / Equipment / Interface Type / Class | | | | | |
| AO Device / Equipment / Interface Identification | | | | | |
| Software Version | | | | | |
| Tested by | | | | | |
| Overall Result Status | Pass / Fail | | | | |
| Applicability | Select 1 or more : ROTV / ROBB / AIDTV | | | | |
| | | | | | |
| CONFORMANCE TEST ITEM LIST | | | | | |
| Test Cases Summary | FORMAT | IN SCOPE | MAN | PASS/FAIL | REM |
| | | | "Y/N" | "P/F" | (*xy) |
| 4. AO Euro-Docsis 3.0 CPE General Functional Requirements | HO | | | | |
| 4.1. Euro Docsis 3.0 Physical Layer General Requirements | | | Y | | |
| 4.2. Older Docsis Versions | | | Y | | |
| 4.3 TLN Docsis Spectrum Plan | | | Y | | |
| 4.4 TLN Docsis Ranging and Carrier Signalling Procedures | | | Y | | |
| 4.5 TLN Docsis Ranging and Carrier Spectrum Plan | | | Y | | |
| 4.6 AO Device Management by TLN Requirements | | | Y | | |
| 5. AO Euro-Docsis CPE Non-Functional Requirements | HO | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Remarks | | | | | |
| (*xy) : "Remark explanation comes here" | | | | | |
| | | | | | |

Appendix A1

Test list for the certification procedures for HFC and Euro-Docsis 3.0 layer connection of AO Euro-Docsis 3.0 equipment to the TLN network, reference code: **TLN-WRO-TA-B-C-PAAB**.

| Test reference or description | | OK/KO /NA | Comment |
|-------------------------------|---|--------------|---------|
| 4 | AO Euro-DOCSIS 3.0 CPE HFC and Euro Docsis 3.0 Physical Layer Functional Requirements | | |
| 4.1 | Euro Docsis 3.0 Physical Layer | | |
| 4.1.a | Check if AO Docsis CPE supports 8x4 Docsis DS/US Carrier System | | |
| 4.1.b | Check if AO Docsis CPE has a 200 MHz tuner receive window at least | | |
| 4.1.c | Check if AO Docsis CPE uses 256 QAM Modulation for Docsis Downstream Carriers | | |
| 4.1.d | Check if AO Docsis CPE uses 16 QAM Modulation for Docsis Upstream Carriers | | |
| 4.1.e | Check if AO Docsis CPE uses 64 QAM Modulation for Docsis Upstream Carriers | | |
| 4.1.f | Check if AO Docsis CPE uses 8 QAM Modulation for Docsis Upstream Carriers as a fall-back mechanism | | |
| 4.1.g | Check if AO Docsis CPE uses QPSK Modulation for Docsis Upstream Carriers as a fall-back mechanism | | |
| 4.1.h | Check if AO Docsis CPE supports S-CDMA | | |
| 4.1.i | Check if AO Docsis CPE supports TLV1 redirection mechanism | | |
| 4.1.j | Check if AO Docsis CPE supports TLV41 redirection mechanism | | |
| 4.2 | Older Docsis Versions | | |
| 4.2.a | Check if AO Docsis CPE is DOCSIS 3.0 compliant only | | |
| 4.3 | TLN Docsis Spectrum Plan | | |
| 4.3.1 | Docsis Downstream Carriers Frequency Plan | | |
| 4.3.1.1 | Check if AO Docsis CPE complies with Harmonic Related Carrier (HRC) or Incremental Related Carrier (IRC) Downstream Carrier Frequency Plans | | |
| 4.3.1.2 | Check if AO Docsis CPE operational frequencies includes all channels between 91 MHz to 1002 MHz at least | | |
| 4.3.1.3 | Check if AO Docsis CPE has a 250KHz spacing of centre frequencies | | |
| 4.3.2 | Docsis Downstream RF Signal Coding and Signal Levels | | |
| 4.3.2.1 | Check if AO Docsis CPE communicates with TLN CMTS on 8-MHz wide downstream path | | |
| 4.3.2.2 | Check if AO Docsis CPE has RF signal requirements as it is described on Appendix A1 in the related Specification Document | | |
| 4.3.3 | Docsis Upstream Carrier Low and High Band Plan | | |
| 4.3.3.1 | Check if AO Docsis CPE attaches in low US band (5-25MHz) for transmission of US Docsis Carriers depending on its | | |

| | | | |
|------------------------|---|--|--|
| <i>local situation</i> | | | |
| 4.3.3.2 | <i>Check if AO Docsis CPE attaches in high US band (25-65MHz) for transmission of US Docsis Carriers depending on its local situation</i> | | |
| 4.3.3.3 | <i>Check if AO Docsis CPE switches between High and Low US bands in order to eliminate ingress noise and balance traffic</i> | | |
| 4.3.4 | Docsis Upstream Carriers Frequency Plan | | |
| 4.3.4.1 | <i>Check if AO Docsis CPE upstream spectrum range is between 5 MHz - 65 MHz</i> | | |
| 4.3.5 | Docsis Upstream RF Signal Coding and Signal Levels | | |
| 4.3.5.1 | <i>Check if AO Docsis CPE communicates with TLN CMTS on 8-MHz wide upstream path</i> | | |
| 4.3.5.2 | <i>Check if AO Docsis CPE supports all the modulation schemes mentioned in the related Specification Document</i> | | |
| 4.3.6 | Docsis Upstream Hopping Channel Concept | | |
| 4.3.6.1 | <i>Check if AO Docsis CPE supports frequency hopping</i> | | |
| 4.4 | TLN Docsis Ranging and Carrier Signalling Procedures | | |
| 4.4.a | <i>Check if AO Docsis CPE discovers and locks to a valid downstream channel of TLN CMTS successfully as it is described in the Flow in the related specification document</i> | | |
| 4.4.b | <i>Check if AO Docsis CPE enters and finalizes the ranging process successfully as it is described in the Flow in the related specification document</i> | | |
| 4.4.c | <i>Check if AO Docsis CPE overrides the existing UCD when it finds a more convenient one</i> | | |
| 4.4.d | <i>Check if AO Docsis CPE can use multiple channels in downstream direction with the channel bonding mechanism</i> | | |
| 4.4.e | <i>Check if AO Docsis CPE supports channel bonding in upstream direction</i> | | |
| 4.4.f | <i>Check if AO Docsis CPE supports the quantity and configuration of Bonding groups in Appendix A1 of related Specification Document</i> | | |
| 4.4.g | <i>Check if AO Docsis CPE is capable working with the remaining channels of a bonding group whenever one or more channels are out of service temporarily</i> | | |
| 4.4.h | <i>Check if AO Docsis CPE supports MDD Recovery</i> | | |
| 4.4.i | <i>Check if AO Docsis CPE sends MDD recovery with updated receive channel set</i> | | |
| 4.4.j | <i>Check if AO Docsis CPE sends MDD recovery with updated receive channel set when the channels were unavailable at registration</i> | | |
| 4.4.k | <i>Check if AO Docsis CPE initialization sequence is proper according to the Flow in related Specification Document</i> | | |
| 4.5 | TLN Docsis Carrier Spectrum Plan | | |
| 4.5.a | <i>Check if Downstream Docsis Carrier Plan is proper as it is described in Appendix A1 of the related Specification Document</i> | | |
| 4.5.b | <i>Check if Upstream Docsis Carrier Plan is proper as it is described in Appendix A1 of the related Specification Document</i> | | |
| 4.6 | AO Device Management by TLN Requirements | | |
| 5 | AO Euro-Docsis 3.0 CPE-Non Functional Requirements | | |