



Broadband Forum Recognised xDSL ITL Technical Checklist

This document serves as a technical guideline for preparation and accreditation assessment of a Broadband Forum recognised ITL (Independent Test Laboratory).

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Scope

The purpose of this document is to establish the technical checklist necessary for the accreditation assessment of a DSL interoperability test laboratory. The assessment process is to determine whether a DSL interoperability test laboratory satisfies the technical and quality requirements that are needed for DSL interoperability testing. The focus of the assessment will be verifying the ability and capability of the facility and engineers to perform testing as per the criteria.

ITLs choosing to seek independent accreditation, should follow the guidelines set out within this document and submit a completed copy to the applicable accreditation body, prior to assessment dates. The Broadband Forum recognises all accreditation bodies that are members of the International Laboratory Accreditation Cooperation (ILAC) (<http://www.ilac.org/>).

It is outside the scope of this document to cover the essential quality requirements for the operation of a testing laboratory.

Acronym List

ADSL	Asymmetric Digital Subscriber Line
BER	Bit Error Rate
CRC	Cyclic Redundancy Check
DSL	Digital Subscriber Line
DSLAM	Digital Subscriber Line Access Multiplexor
FDRA	Fine Data Rate Adjustment
H/w	Hardware
ILAC	International Laboratory Accreditation Cooperation
ITL	Independent Test Laboratory
IUT	Instrument Under Test
LAN	Local Area Network
OI	Operating Instructions
PSD	Power Spectral Density
SHDSL	Single-Pair High-Speed Digital Subscriber Line
SUT	Sample Under Test
S/w	Software
TCRL	Test Case Reference List
TR	Technical Report
VDSL	Very High Bit Rate Digital Subscriber Line

Phrase List

Test Plan	Test plan is intended as the selection of test cases from the relevant specification as applicable to a given test campaign.
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1. Introduction

The Broadband Forum recognised ITL technical checklist is a voluntary procedure for ITL labs to follow in order to achieve accreditation and therefore, gain higher recognition and reputation from the service provider community.

2. ITL Scope

3. Assertions to applicable ITL scope

Requirements in this section shall be supported by attachments appended to the Technical Assessment Report. Prior to assessment, the candidate shall have declared their capability as part of the ITL accreditation procedure.

- ITL personnel shall exhibit competence to perform all test cases within the accreditation scope. The assessor shall review and witness all test cases within the proposed scope during the assessment. At the Broadband Forum discretion, the number of witnessed test cases may be reduced once capability has been adequately demonstrated.
- ITL shall be capable of performing all test cases, which are in the minimum requirements for initial accreditation in the proposed accreditation scope. Exceptions may be allowed for any test case for which a valid reason is documented.
- ITL may subcontract testing to a third party facility, accredited according to ISO17025 or EN45001 for DSL interoperability.
- Capability related to test cases not supported by the accredited ITL shall not be claimed in the accreditation scope.

3.1 General overview of the lab

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
3.1.1	Can candidate staff exhibit competence to perform the test cases within the accreditation scope?				
3.1.2	Has candidate capability to perform all test cases within proposed accreditation scope at the time of assessment?				
3.1.3	Internationally recognised ISO17025 accreditation relevant for wireline telecommunications technology testing, whereby the quality aspects of the test facility are met				
3.1.4	DSL testing experiences prior to Assessment are documented				

4. DSL Testing Documentation

4.1 DSL Working Instruction

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
4.1.1	Verification of Loop & Noise compensation of the test system				
4.1.2	Generation of a DSL conformance test report compliant to the appropriate DSL Forum published test report format & applicable Quality Standard				
4.1.3	Training & Procedures to ensure up to date DSL technical knowledge of the testing staff				
4.1.4	Procedure to generate a test plan				
4.1.5	Procedure for continuously updating measurement equipment relative to validated, commercial available test cases				
4.1.6	Procedure to manage a clients tested configuration				

4.1.7	Procedure to introduce a new DSLAM into the lab environment				
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4.2 DSL Operating Instructions

For the execution of a single test case, the set-up of the IUT/SUT and the adjustment of the test equipment are described in the Operating Instructions (OI). These instructions ensure the possibility of test reproduction; therefore, they must be kept updated relative to the test case reference list.

Required operating instructions:

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
4.2.1	Procedure to connect the IUT/SUT to the test equipment				
4.2.2	Operation of physical layer (Layer 1) tests				
4.2.3	Operation of higher layer (Layer 3) tests				

5. DSL Project Documentation

5.1 Project handling and Document Control

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
5.1.1	<p>Are project documents available to operate a test project?</p> <p>Such as:</p> <ul style="list-style-type: none">• Specifications?• Test Plan?• Operating Manuals?				
5.1.2	<p>How is it ensured that the employees of the lab have the current version of the specifications, test specifications, advisory notes & test case & specification errata available?</p>				

5.2 Test Campaign Plan

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
5.2.1	Explain & demonstrate the generation of a test campaign plan				

5.3 Test Report

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
5.3.1	Explain & demonstrate the generation of a sample test report				
5.3.2	Explain how the generated test report is consistent, complete & correct with respect to the test plan				
5.3.3	Is the IUT/SUT unambiguously identified in the test reports (s/w & h/w versions)?				

5.4 Test Specifications

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
5.4.1	How is it ensured that the employees of the lab have the current version of the test specifications, advisory notes, or test case errata available?				

6. DSL Test System and Environment

6.1 Test Environment

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
6.1.1	Describe the infrastructure provided for the testing (e.g. lab space, LAN network, etc)				
6.1.2	How is the nominal temperature & humidity measured & recorded?				
6.1.3	How is the noise floor of the lab measured & controlled?				

6.2 Calibration of the Test Equipment

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
6.2.1	How is the ongoing calibration of the measurement equipment & facility (e.g. Noise Floor of the lab) documented?				

6.3 Test Equipment Handbook

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
6.3.1	How is the DSL measurement equipment documented? (It has to be demonstrated, which equipment will be used for DSL testing)				
6.3.2	Identify all the pieces of test equipment applicable to the ITL scope				
6.3.3	Does a timetable of calibration exist?				
6.3.4	Is test equipment documentation				

	available?				
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6.4 Electrical Performance Testing

All requirements necessary for DSL testing are specified in the current version of the test specifications, which are available over the Broadband Forum web site. The personal operating tests according to the DSL test specification must have detailed knowledge of the DSL test requirements and must be capable to perform these tests.

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
6.4.1	Describe PSD test capabilities				
6.4.2	Describe Total Output Power test capabilities				
6.4.3	Describe Balance test capabilities				
6.4.4	How are the system measurement uncertainties of the used test equipment calculated? (uncertainty budgets) How are the requirements of the appropriate test specification fulfilled?				

6.5 Physical Layer (Layer 1)

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
6.5.1	Describe how cross talk noise injection is				

	performed				
6.5.2	Describe how loop tests are set for adaptive rate				
6.5.3	Describe how loop tests are set for fixed rate				

6.6 Normal/Extreme Conditions

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
6.6.1	Describe what measures are taken to reduce environmental impairments (temperature, humidity, environmental emissions, background noise, etc)				

6.7 BER Measurement

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
6.7.1	Demonstrate how bit error measurements are performed				

6.8 Higher Layer (Layer 3) tests

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
6.8.1	Demonstrate how CRC error counts are used to calculate the approximate BER				
6.8.2	Demonstrate how latency is measured				
6.8.3	Demonstrate how throughput is measured				

6.9 DSL Test System Capability Process

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
6.9.1	How are test systems maintained current with test system upgrades?				
6.9.2	What version(s) of the test system(s) are available? Are available version(s) current with test system upgrades?				
6.9.3	Are test system verification reports available?				
6.9.4	How is it ensured that the test case implementation complies with the test specifications?				
6.9.5	Describe the maintenance schedule for DSL test systems pertinent to the ITL scope?				

7. DSL Personnel

7.1 Former Experience

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
7.1.1	What previous relevant testing experience do the personnel have?				
7.1.2	Do the staff training records indicate DSL technology training?				
7.1.3	Describe any contribution made in the past to the Broadband Forum				

7.2 Training of Employees

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
7.2.1	List the standardisation groups where the lab is a member				
7.2.2	How is ongoing education on the DSL technology ensured?				

7.3 DSL Know How - Test Strategy

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
7.3.1	Demonstrate that laboratory staff are familiar with the testing concept for DSL products				

7.4 DSL Know How - Test Specifications

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
7.4.1	Demonstrate that the lab testing staff are familiar with the Broadband Forum TR specifications				
7.4.2	Explain the use of a TR specification with respect to the selection of relevant test cases				

7.5 DSL Responsibilities

No.	Question	Documents supplied by ITL applicant	Description & comments by ITL applicant	Accreditation assessment notes	Status after assessment
7.5.1	Provide a personnel list indicating DSL testing responsibilities covering the applicable areas of DSL testing (ADSL, SHDSL, VDSL, etc)				
7.5.2	Provide a contact person responsible for managing the DSL testing				

8. Source

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