Unified Test Plan for DVB-C and DVB-T2 digital receivers for the Finnish market

Version 4.1

2018-01-30

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1 Introduction

1.1 General

This document describes the test plan for DVB-C and DVB-T2 receivers for the Finnish Digital Terrestrial and Cable Television market.

The test cases in this document refer to the requirements in the Unified Requirements for DVB-C and DVB-T2 Digital Receivers for the Finnish Market [1].

This test plan document shall come into force on 1st of March 2018. IRDs launched before that date shall be tested according to either to the Unified Test Specification for HDTV DVB-C and DVB-T2 digital receiver for Finnish market v4.0 or this document by choice of the IRD manufacturer.

1.2 Version History

Version	Date	Comments
V. 1.0	18.11.2010	1st release version
V. 2.0	13.12.2011	PVR tasks added, Nordig PVR tasks removed.
V. 3.0	-	Unreleased, adapted from V. 2.0.
V. 4.0	15.12.2016	Harmonized release together with Unified Rules of Operation and Unified Requirements.
V.4.1	30.1.2018	Annual update. References updated to NorDig Test Plan 2.6

1.3 References

[1] Unified Requirements of DVB-C and DVB-T2 digital receiver for Finnish market, V 4.1(2018-01-30)

[2] NorDig Unified Requirements for Integrated Receiver Decoders for use in cable, satellite, terrestrial and IP-based networks, version 2.6 (2017-01-20)

[3] NorDig Unified Test Plan for Integrated Receiver Decoders, version 2.6.0

[4] Security requirements of digital HDTV receiver for the Finnish market, Version 2.0. (2011-12-13)

[5] Unified Requirements of HDTV DVB-C and DVB-T2 digital receiver for Finnish market, Version 2.0 (2011-12-13)

[6] CI Plus Specification – Content Security Extensions to the Common Interface v1.3.1

[7] CENELEC EN 50221 (02-1997): "Common Interface Specification for Conditional Access and other Digital Video Broadcasting Decoder Applications"

[8] Digital Video Broadcasting (DVB): Digital broadcasting systems for television, sound and data services: Specification for Service Information (SI) in Digital Video Broadcasting (DVB) systems, ETSI EN 300 468, V1.14.1

[9] Digital Terrestrial TV Broadcast Receivers; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU, ETSI EN 303 340 V1.1.1 (2016-05)

[10] Digital Broadcasting Systems for Television, Sound and Data Services; Guidelines on the Implementation and Usage of DVB Service Information, ETSI TR 101 211, V1.12.1.

[11] Digital Video Broadcasting (DVB); Specification for conveying ITU-R System B Teletext in DVB bitstreams, ETSI EN 300 472, V1.3.1. (2003-05)

[12] ETSI TS 102 796 1.4.1 Hybrid Broadcast Broadband TV

[13] TS 102 796 V1.4.1 Errata 1 dated 1 June 2017

[14] HbbTV specification v1.5, HbbTV Association 2012 (2012-03-16)

[15]HbbTV Test Suite v9.2.1 test list, https://www.hbbtv.org/wp-content/uploads/2018/01/HbbTV-TG-00116-000-HbbTV-testcases-v9.2.1.pdf, HbbTV 2018

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[17] OIPF Release 1 Specification Volume 7 – Authentication, Content Protection and Service Protection [V1.1] – (2009-10-08)
[18] ISO/IEC 23001-7 MPEG Common Encryption (Previously Annex I of [ISOBFF])
[19] ISO/IEC 14496-12 ISO Base File Format
[20] ISO/IEC 23009-1 Information technology –Dynamic adaptive streaming over HTTP (DASH) – Part 1: Media presentation description and delivery formats
[21] Microsoft PlayReady http://www.microsoft.com/playready/default.mspx
[22] PlayReady Documentation CHM file, available to PlayReady licensees, version 2.0
[23] PlayReady Format Specification, included in MSPR1, version 2.0
[24] PlayReady Integration to HbbTV Specification, version 1.0
[25] PlayReady Binding to MPEG-DASH Specification, version 1.0

1.4 Definitions and abbreviations

Shall Requirement which is mandatory to implement

Should Requirement which is not mandatory to implement but strongly recommended

AC-3	Audio Codec-3 (Dolby Digital)
AVC	Advanced Video Codec
BER	Bit Error Ratio
CAS	Conditional Access System
CI	Common Interface
CI+	Common Interface Plus
CRID	Content Reference Identifier
DASH	Dynamic Adaptive Streaming over HTTP
DRM	Digital Rights Management
DVB	The Digital Video Broadcasting Project
DVB-C	DVB standard for Digital Cable Transmission
DVB-T	DVB standard for Digital Terrestrial Transmission
DVB-T2	DVB standard for Digital Terrestrial Transmission – 2nd generation
HbbTV	Hybrid Broadcast Broadband TV
HDCP	High-Bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDTV	High Definition Television
HE-AACL2	High-Efficiency Advanced Audio Coding Version 1 Level 2
HE-AACL4	High-Efficiency Advanced Audio Coding Version 1 Level 4
HEVC	High-Efficiency Video Coding
HOH	Hard-Of-Hearing
EIT	Event Information Table
EPG	Electronic Program Guide
E-AC3	Enhanced AC-3
GUI	Graphical User Interface
IDTV	Integrated Digital TV-set
IRD	Integrated Receiver Decoder
LCN	Logical Channel Number
NIT	Network Information Table
ONID	Original Network ID

OTA	Over-The-Air
PAL	Phase Alternating Line
PSI	Program Specific Information
PTS	Presentation Time Stamp
PVR	Personal Video Recorder
QAM	Quadrature Amplitude Modulation
RF	Radio Frequency
SAS	Specific Application Support
SDT	Service Description Table
SFN	Single Frequency Network
SI	Service Information
SID	Service ID
SQI	Signal Quality Indicator
SSI	Signal Strength Indicator
SSU	System Software Update
STB	Set-Top-Box
TDT	Time/Date Table
TOT	Time Offset Table
TS	Transport Stream
TSID	Transport Stream ID
UHD	Ultra High Definition
UHDTV	Ultra High Definition Television
UHF	Ultra High Frequency
USB	Universal Serial Bus
VHF	Very High Frequency

2 Test categories

FiCom requirements and test plan are based on the NorDig Unified Requirements specification v2.6 [2] and NorDig Unified Test Plan v2.6.0 [3] and Finland-specific tasks for Terrestrial and Cable IRDs with additional PVR tests and optional HbbTV tests.

These tasks shall be run with in a test environment following the Finnish networks signalization and Finnish locale, according to FiCom RoO v4.1. Unless otherwise noted, terrestrial streams shall be broadcasted with Original network ID 0x20F6.

The applicable NorDig tests are listed in chapter 3.5.

When IRD supports multiple transmission media, IRD shall be validated as follows:

- IRD contains DVB-T/T2 tuner; Antenna Ready HD tests shall be tested.
- IRD contains DVB-C tuner; Cable Ready HD tests shall be tested.
- IRD contains recording capability; PVR tests shall be tested in addition to the Antenna Ready HD and/or Cable Ready HD tests.
- IRD contains HbbTV capabilities and manufacturer has requested the ‘Smart’ tests; HbbTV tests shall be tested in addition to the Antenna Ready HD tests.

3 Test scope

The table below maps the FiCom requirements [1] into the corresponding test tasks and shows the relevance of the tested requirements per the certification procedure.

Requirement	**Shall / M m** (Mandatory / if applicable) **Should / O o** (Optional / if applicable)				Task Number(s)
	Antenna Ready HD	**Cable Ready HD**	**+PVR**	**+SMART**	
4.1-0	M	M	-	-	4.1:4
4.1-1	M	-	-	-	4.1:1, 4.1:2, 5.2:5, 5.2:6
4.1-2	-	M	-	-	4.1:3
4.1-3	M	M	-	-	4.1:5
4.1-4	M	M	-	-	4.1:6
4.1-5	M	M	-	-	4.1:8, 4.1:9
4.1-6	M	M	-	-	4.1:9
4.1-7	M	M	-	-	4.1:7
4.1-8	O	O	-	-	-
4.1-9	m	-	-	M	15.1:1, 15.1:3
4.2-0	M	M	-	-	4.1:7
4.2-1	m	m	-	-	4.2:1, 14.2:6
4.2-2	m	m	-	-	4.2:1, 14.2:6
4.2-3	m	m	-	-	4.2:2
4.2-4	M	M	-	-	4.2:1, 14.2:6
4.2-5	m	m	-	-	6.2:3
4.3-0	M	M	-	-	4.3:2
4.3-1	M	M	-	-	4.3:1, 4.3:2
4.3-2	M	M	-	-	4.3:1, 4.3:2
5.1-1	M	M	-	-	5.1:1
5.1-2	M	M	-	-	5.1:1
5.1-3	O	O	-	-	5.1:1
5.1.1-1	M	M	-	-	5.1:1
5.1.1-2	M	M	-	-	5.1:1
5.1.1-3	O	O	-	-	5.1:1
5.1.2-1	M	M	-	-	5.1:1
5.1.2-2	M	M	-	-	5.1:1
5.1.3-1	m	m	-	-	5.1:1
5.1.4-1	M	M	-	-	5.1:1
5.1.4-2	M	M	-	-	5.1:1
5.1.4-3	O	O	-	-	-
5.2.1-1	M	-	-	-	5.2:1
5.2.1-2	M	-	-	-	5.2:1
5.2.1-3	M	-	-	-	5.2:1
5.2.1-4	M	-	-	-	5.2:1
5.2.1-5	M	-	-	-	5.2:1
5.2.1-6	M	-	-	-	5.2:1

Requirement	**Shall / M m** (Mandatory / if applicable) **Should / O o** (Optional / if applicable)				Task Number(s)
	Antenna Ready HD	**Cable Ready HD**	**+PVR**	**+SMART**	
5.2.2-1	M	-	-	-	5.2:2
5.2.2-2	M	-	-	-	5.2:2
5.2.2-3	M	-	-	-	5.2:2
5.2.2-4	M	-	-	-	5.2:2
5.2.3-1	M	-	-	-	5.2:3, 5.2:4
5.2.3-2	M	-	-	-	5.2:4
5.2.3-3	M	-	-	-	5.2:3
5.2.3-4	M	-	-	-	5.2:3, 5.2:4
5.2.3-5	M	-	-	-	5.2:3
5.2.3-6	O	-	-	-	-
5.2.4-0	M	-	-	-	4.1:2, 5.2:5, 5.2:6
5.2.4-1	M	-	-	-	5.2:7, 5.2:8, 5.2:9
5.2.4-2	M	-	-	-	5.2:7, 5.2:8, 5.2:9
5.3.1-1	-	M	-	-	5.3:1
5.3.1-2	-	M	-	-	5.3:1
5.3.1-3	-	M	-	-	5.3:1
5.3.1-4	-	M	-	-	5.3:1
5.3.1-5	-	M	-	-	5.3:1
5.3.1-6	-	M	-	-	5.3:1
5.3.1-7	-	M	-	-	5.3:1
5.3.1-8	-	M	-	-	5.3:1
5.3.2-1	-	M	-	-	5.3:2
5.3.2-2	-	M	-	-	5.3:2
5.3.2-3	-	M	-	-	5.3:2
5.3.2-4	-	M	-	-	5.3:2
5.3.2-5	-	M	-	-	5.3:2
6-1	M	M	-	-	6.0:1
6-2	M	M	-	-	6.0:1
6-3	M	M	-	-	6.0:1
6-4	O	O	-	-	-
6-5	O	O	-	-	-
6-6	M	M	-	-	6.0:1
6-7	M	M	-	-	6.0:1
6-8	M	M	-	-	6.0:1
6.1-1	M	M	-	-	6.1:1
6.1-2	M	M	-	-	6.1:1
6.1-3	M	M	-	-	6.1:2
6.1-4	M	M	-	-	6.1:2
6.1-5	M	M	-	-	6.1:2
6.1-6	M	M	-	-	6.1:2
6.1-7	M	M	-	-	6.1:2

Requirement	**Shall / M m** (Mandatory / if applicable) **Should / O o** (Optional / if applicable)				Task Number(s)
	Antenna Ready HD	**Cable Ready HD**	**+PVR**	**+SMART**	
6.1-8	M	M	-	-	6.1:2
6.1-9	m	m	M	-	14.1:1
6.1-10	M	M	-	-	6.1:2
6.2-1	M	M	-	-	6.2:1
6.2-2	M	M	-	-	6.2:1
6.2.1-1	m	m	m	-	6.2:2, 6.2:3, 14.2:6
6.2.1-2	m	m	m	-	6.2:2, 6.2:3, 14.2:6
6.2.1-3	m	m	m	-	6.2:2, 6.2:3, 14.2:6
6.2.1-4	o	o	o	-	6.2:2, 6.2:3, 14.2:6
6.2.1-5	o	o	o	-	6.2:2, 6.2:3, 14.2:6
6.3-1	M	M	-	-	6.3:1, 6.3:2
6.3-2	M	M	-	-	6.3:1, 6.3:2
6.3-3	M	M	-	-	6.3:1, 6.3:2
6.4-1	M	M	-	-	6.4:1
6.4-2	M	M	-	-	6.4:1
6.4-3	M	M	-	-	6.4:1
7-1	M	M	-	-	7.1:1
7-2	M	M	-	-	7.1:1
7-3	M	M	-	-	7.1:1
8-1	M	M	-	-	8.0:1
8-2	M	M	-	-	8.0:1, 8.0:2, 8.0:3
8-3	M	M	-	-	8.0:1
8-4	m	m	-	-	8.0:2, 8.0:3
8-5	m	m	M	-	8.0:4
8-6	m	m	-	-	8.0:5, 8.0:6
9-1	M	M	-	-	9.0:1
9-2	M	M	-	-	9.0:2
9-3	M	M	-	-	9.0:2
9-4	M	M	-	-	9.0:1
9-5	O	O	-	-	9.0:1
9-6	M	M	-	-	9.0:1
9.1-1	M	M	-	-	9.1:1
9.1-2	M	M	-	-	9.1:1
9.1-3	m	m	M	-	14.1:1
10-1	M	M	-	-	10.0:1, 10.0:2
10-2	M	M	-	-	10.0:1, 10.0:2
11-1	M	M	-	-	11.1:1
11-2	M	M	-	-	11.1:1
12-1	M	M	M	-	12.1:1, 14.6:1
12-2	M	M	-	-	12.1:1
12-3	O	O	-	-	-

Requirement	**Shall / M m** (Mandatory / if applicable) **Should / O o** (Optional / if applicable)				Task Number(s)
	Antenna Ready HD	**Cable Ready HD**	**+PVR**	**+SMART**	
13-1	M	M	-	-	13.1:1
13-2	M	M	-	-	13.1:1
14-0	informative	informative	informative	-	14.1:1, 14.6:1
14.1-1	o	o	O	-	14.1:1
14.1-2	o	o	O	-	-
14.2-1	m	m	M	-	14.2:2, 14.2:3
14.2-2	m	m	M	-	14.1:1, 14.2:2, 14.2:3
14.2-3	m	m	M	-	14.1:1, 14.2:6
14.2-4	m	m	M	-	14.1:1, 14.2:1
14.2-5	m	m	M	-	14.2:5
14.2.1-1	m	m	M	-	14.2:2
14.2.2-1	m	m	M	-	14.2:3
14.2.2-2	o	o	O	-	-
14.3-1	m	m	M	-	14.3:1
14.3-2	m	m	M	-	14.1:1
14.3-3	m	m	M	-	14.1:1, 14.3:2
14.3-4	m	m	M	-	14.1:1
14.3-5	m	m	M	-	14.1:1
14.4-1	m	m	M	-	14.1:1
14.4-2	m	m	M	-	14.1:1
14.4-3	o	o	O	-	-
14.4-4	m	m	M	-	14.1:1
14.4-5	m	m	M	-	14.1:1
14.4-6	o	o	O	-	-
14.5-1	m	m	M	-	14:1.1
14.5-2	m	m	M	-	14:1.1
14.5-3	m	m	M	-	14:1.1
14.5-4	m	m	M	-	14:5.1
14.6-1	m	m	M	-	14.6:1
14.6-2	m	m	M	-	14.6:2
15.1-1	m	-	-	M	15.1:1
15.1-2	m	-	-	M	15.1:2
15.1-3	m	-	-	M	15.1:3
15.1-4	m	-	-	M	15.1:2, 15.1:4
15.1-5	m	-	-	M	15.1:5
15.1-6	m	-	-	M	15.1:6
15.1-7	m	-	-	M	15.1:7
15.1-8	m	-	-	M	15.1:8
15.1-9	o	-	-	O	15.1:9
15.1-10	m	-	-	M	15.1:10
15.1-11	m	-	-	M	15.1:11

Requirement	**Shall / M m** (Mandatory / if applicable) **Should / O o** (Optional / if applicable)				Task Number(s)
	Antenna Ready HD	**Cable Ready HD**	**+PVR**	**+SMART**	
15.1-12	m	-	-	M	15.1:12
15.1-13	m	-	-	M	15.1:13
15.1-14	m	-	-	m	15.1:14
15.1-15	o	-	-	O	15.1:15
15.2.1-1	m	-	-	M	15.2:1
15.2.2-1	m	-	-	M	15.2:2
15.2.2-2	m	-	-	M	15.2:3
15.2.2-3	m	-	-	M	15.2:4
15.2.3-1	m	-	-	M	15.2:5
15.2.3-2	o	-	-	O	15.2:6
15.2.4-1	m	-	-	M	-
15.2.4-2	m	-	-	M	-
15.2.4-3	m	-	-	M	-
15.3-1	informative	-	-	informative	-
15.3-2	m	-	-	M	15.3:1

3.1 Test tasks for Cable Ready HD IRDs

Test tasks for Cable Ready HD shall be performed for IRDs equipped with a DVB-C cable tuner.

Test Task
FiCom-4.1:3 Cable – DVB-C RF performance - NorDig
FiCom-4.1:4 MPEG-2 Demultiplexer - NorDig
FiCom-4.1:5 Video - NorDig
FiCom-4.1:6 Audio - NorDig
FiCom-4.1:7 Interfaces and Signal levels – NorDig
FiCom-4.1:8 CI+ interface and interoperability with CI+CAM modules
FiCom-4.1:9 Interoperability with CA system
FiCom-4.2:1 HEVC Resolutions and framerates
FiCom-4.2:2 HEVC Component priority
FiCom-4.3:1 Supplementary Audio Indication
FiCom-4.3:2 Dynamic Update of PMT: Supplementary Audio
FiCom-5.1:1 IRD installation
FiCom-5.3:1 Cable: Automatic scan
FiCom-5.3:2 Cable: Manual scan
FiCom-6.0:1 Service Information and Program Specific Information - NorDig
FiCom-6.1:1 Network evolution - NorDig
FiCom-6.1:2 Network evolution - User actions
FiCom-6.2:1 PSI/SI Forward compatibility and robustness
FiCom-6.2:2 HEVC service_type and service priorities
FiCom-6.2:3 HEVC services - NorDig
FiCom-6.3:1 EPG information - NorDig

Test Task
FiCom-6.3:2 EPG information in Finland
FiCom-6.4:1 System time
FiCom-7.1:1 Signal level meter and Network information display
FiCom-8.0:1 System Software Update: General
FiCom-8.0:3 System Software Update: DVB-SSU / NorDig - Cable
FiCom-8.0:6 System Software Update: CI+ Module: NorDig - Cable
FiCom-9.0:1 Teletext and Subtitling: NorDig
FiCom-9.0:2 Teletext and Subtitling: Hard of Hearing
FiCom-9.1:1 Teletext subtitling and pages, with and without PTS transmission
FiCom-10.0:1 User interface - NorDig
FiCom-10.0:2 User interface
FiCom-11.1:1 Zapping performance
FiCom-12.1:1 Power management
FiCom-13.1:1 IRD accessories and packaging
FiCom-16.0:4 Field test - General operation in Cable networks
FiCom-16.0:5 Field test – Durability in Cable networks

3.2 Test tasks for Antenna Ready HD IRDs

Test tasks for Antenna Ready HD shall be performed for IRDs equipped with a DVB-T2 terrestrial tuner.

Test Task
FiCom-4.1:1 Terrestrial – DVB-T RF performance - NorDig
FiCom-4.1:2 Terrestrial – DVB-T2 RF performance - NorDig
FiCom-4.1:4 MPEG-2 Demultiplexer - NorDig
FiCom-4.1:5 Video - NorDig
FiCom-4.1:6 Audio - NorDig
FiCom-4.1:7 Interfaces and Signal levels – NorDig
FiCom-4.1:8 CI+ interface and interoperability with CI+CAM modules
FiCom-4.1:9 Interoperability with CA system
FiCom-4.2:1 HEVC Resolutions and framerates
FiCom-4.2:2 HEVC Component priority
FiCom-4.3:1 Supplementary Audio Indication
FiCom-4.3:2 Dynamic Update of PMT: Supplementary Audio
FiCom-5.1:1 IRD installation
FiCom-5.2:1 Terrestrial: Automatic scan
FiCom-5.2:2 Terrestrial: Manual scan
FiCom-5.2:3 Terrestrial: Multiple channel numbers per service
FiCom-5.2:4 Terrestrial: Simultaneous reception of multiple networks and NorDig LCD
FiCom-5.2:5 Terrestrial: DVB-T2 C/N performance on Gaussian channel
FiCom-5.2:6 Terrestrial: DVB-T2 Minimum receiver signal input levels on Gaussian channel
FiCom-5.2:7 Terrestrial: DVB-T2: Performance: Immunity to “LTE” – Adjacent channel sensitivity
FiCom-5.2:8 Terrestrial: DVB-T2: Performance: Immunity to “LTE” – Blocking
FiCom-5.2:9 Terrestrial: DVB-T2: Performance: Immunity to “LTE” – Overloading
FiCom-6.0:1 Service Information and Program Specific Information - NorDig

Test Task
FiCom-6.1:1 Network evolution - NorDig
FiCom-6.1:2 Network evolution - User actions
FiCom-6.2:1 PSI/SI Forward compatibility and robustness
FiCom-6.2:2 HEVC service_type and service priorities
FiCom-6.2:3 HEVC services - NorDig
FiCom-6.3:1 EPG information - NorDig
FiCom-6.3:2 EPG information in Finland
FiCom-6.4:1 System time
FiCom-7.1:1 Signal level meter and Network information display
FiCom-8.0:1 System Software Update: General
FiCom-8.0:2 System Software Update: DVB-SSU / NorDig - Terrestrial
FiCom-8.0:5 System Software Update: CI+ Module: NorDig - Terrestrial
FiCom-9.0:1 Teletext and Subtitling: NorDig
FiCom-9.0:2 Teletext and Subtitling: Hard of Hearing
FiCom-9.1:1 Teletext subtitling and pages, with and without PTS transmission
FiCom-10.0:1 User interface - NorDig
FiCom-10.0:2 User interface
FiCom-11.1:1 Zapping performance
FiCom-12.1:1 Power management
FiCom-13.1:1 IRD accessories and packaging
FiCom-16.0:1 Field test - General operation in Terrestrial networks
FiCom-16.0:2 Field test – Durability in Terrestrial networks

3.3 Test tasks for IRDs with recording capability

In addition to the *Antenna Ready HD* tests and/or *Cable Ready HD* tests, PVR tests shall be performed for IRDs with recording capability. PVR tests are applicable to the extent IRD manufacturer has stated the IRD recording capability. Information on the PVR test scope is available at FiCom Unified v4.0 [1] Annex D.

PVR field tests shall be performed in all non-regional terrestrial networks and at least one cable network, depending on the main certification testing target.

Test Task
FiCom-8.0:4 System Software Update: PVR recordings
FiCom-14.1:1 PVR: NorDig
FiCom-14.2:1 Content protection according to the security requirements
FiCom-14.2:2 PVR: Free and Scrambled content, IRD with integrated CAS
FiCom-14.2:3 PVR: Free and Scrambled content, IRD with CI+ slot
FiCom-14.2:4 PVR: Number of components, IRD with integrated CAS
FiCom-14.2:5 PVR: Number of components, IRD with CI+ slot
FiCom-14.2:6 PVR: Recording a service with HEVC video
FiCom-14.3:1 PVR: Maximum number of simultaneous recordings
FiCom-14.3:2 PVR: Management of external storage mass media
FiCom-14.5:1 PVR: Navigator and user preferences
FiCom-14.6:1 PVR: System time management

FiCom-14.6:2 PVR: Changes in TDT/TOT
FiCom-16.0:3 Field test –PVR in Terrestrial networks
FiCom-16.0:6 Field test –PVR in Cable networks

3.4 Test tasks for Antenna Ready Smart HD IRDs

In addition to *Antenna Ready HD* tasks, the following tasks shall be tested for hybrid IRDs targeting the *Antenna Ready Smart HD* certification.

Test Task
FiCom-15.1:1 HbbTV support
FiCom-15.1:2 Playready support
FiCom-15.1:3 HbbTV Test Suite compliance
FiCom-15.1:4 Device capabilities and DRMSystemID
FiCom-15.1:5 Application lifecycle shall not disturb A/V
FiCom-15.1:6 DSMCC Stream Event support
FiCom-15.1:7 Stability
FiCom-15.1:8 HbbTV Stack protection from DVB stack
FiCom-15.1:9 Version and profile signaling
FiCom-15.1:10 EXIT key
FiCom-15.1:11 TELETEXT key
FiCom-15.1:12 HbbTV enabled setting
FiCom-15.1:13 HbbTV Autostart setting
FiCom-15.1:14 EBU-TT subtitle support (Optional)
FiCom-15.1:15 Navigator indicator for HbbTV Apps
FiCom-15.2:1 Unicast streaming
FiCom-15.2:2 MPEG DASH Support
FiCom-15.2:3 Initialization of DASH segments
FiCom-15.2:4 Live DASH seeking
FiCom-15.2:5 Disabling trick play modes for broadband content
FiCom-15.2:6 Trick play modes for broadband content
FiCom-15.3:1 Security: Application ID ranges
FiCom-15.3:2 DRM-DASH Reference app
FiCom-16.0:7 Field test – HbbTV

HbbTV tests shall be performed for hybrid IRDs targeting at Antenna Ready Smart HD certification.

HbbTV field tests shall be performed in all applicable networks with HbbTV signalization.

3.5 Applicable NorDig Test Plan 2.6.0 tasks

The following NorDig Test Plan 2.6.0 tasks shall be conducted as a part of this test plan.

NorDig Test Plan 2.6.0 task	**FiCom task(s)**
Task 2:1 General	4.1:3
Task 2:2 General	4.1:3
Task 2:3 Quality reception detector	4.1:3
Task 2:4 RF Characteristics: Input frequency range and input level, Digital channels	4.1:3
Task 2:5 RF Characteristics: Symbol rate and modulation	4.1:3
Task 2:6 RF Characteristics: Input impedance	4.1:3

NorDig Test Plan 2.6.0 task	FiCom task(s)
Task 2:7 RF bypass	4.1:3
Task 2:10 Tuning/Scanning procedure (Original_network_id, transport_stream_id and service_id triplet support)	4.1:3
Task 2:13 Total input power	4.1:3
Task 2:14 RF Performance - C/N for Reference BER	4.1:3
Task 2:15 RF Performace - C/N with echo	4.1:3
Task 2:16 Performance Data: Noise figure	4.1:3
Task 2:17 RF Performance - Image Channel	4.1:3
Task 2:18 RF Performance – Digital Adjacent Channel	4.1:3
Task 2:20 LO leakage	4.1:3
Task 2:21 Spurious emission	4.1:3
Task 2:22 Radiation	4.1:3
Task 3:1 General	4.1:1
Task 3:2 General	4.1:1
Task 3:3 Quality reception detector	4.1:1
Task 3:4 Frequencies: Center frequencies	4.1:1
Task 3:5 Frequencies: Frequency offset	4.1:1
Task 3:6 Frequencies: Signal bandwidths	4.1:1
Task 3:7 Modes	4.1:1
Task 3:8 Tuning/Scanning Procedure: General	4.1:1
Task 3:9 Tuning/Scanning Procedures: Basic status check	4.1:1
Task 3:10 Tuning/Scanning Procedures: Automatic channel search for the same service bouquet	4.1:1
Task 3:11 Tuning/Scanning: Automatic channel search for different service bouquets	4.1:1
Task 3:12 Tuning/Scanning Procedures: Manual Channel Search	4.1:1
Task 3:13 Verification of Signal Strength Indicator (SSI)	4.1:1
Task 3:14 Verification of Signal Quality Indicator (SQI)	4.1:1
Task 3:15 Changes In Modulation Parameters	4.1:1
Task 3:16 RF input connector	4.1:1
Task 3:17 RF output connector	4.1:1
Task 3:18 Performance: BER vs C/N verification	4.1:1
Task 3:19 Performance: C/N performance on Gaussian channel	4.1:1
Task 3:20 Performance: C/N performance on 0dB echo channel	4.1:1
Task 3:21 Performance: Minimum receiver signal input levels on Gaussian channel	4.1:1
Task 3:22 Performance: Minimum IRD Signal Input Levels on 0dB echo channel	4.1:1
Task 3:23 Performance: Noise figure on Gaussian channel	4.1:1
Task 3:24 Performance: Maximum Receiver Signal Input Levels	4.1:1
Task 3:25 Performance: Immunity to “digital” signals in Other Channels	4.1:1
Task 3:26 Performance: Immunity to “LTE 700 MHz” signals in Other Channels	4.1:1
Task 3:27 Performance: Immunity to “LTE 800 MHz” signals in Other Channels	4.1:1
Task 3:28 Performance: Performance in Time-Varying Channels	4.1:1
Task 3:29 Performance: Synchronisation for varying echo power levels in SFN	4.1:1
Task 3:30 Performance: C/(N+I) Performance in SFN for more than one echo	4.1:1
Task 3:31 Performance: C/(N+I) Performance in SFN inside the guard interval	4.1:1
Task 3:32 Performance: C/(N+I) Performance in SFN outside the guard interval	4.1:1
Task 3:33 DVB-T2: Frequencies: Center frequencies	4.1:2
Task 3:34 DVB-T2: Frequencies: Frequency offset	4.1:2
Task 3:35 DVB-T2: Frequencies: Signal bandwidths	4.1:2
Task 3:36 DVB-T2: Modes	4.1:2

NorDig Test Plan 2.6.0 task	FiCom task(s)
Task 3:37 DVB-T2: MISO	4.1:2
Task 3:38 DVB-T2: Input Mode B (multiple PLPs)	4.1:2
Task 3:39 DVB-T2: Input Mode B (multiple PLPs and common PLP)	4.1:2
Task 3:40 DVB-T2: Input Mode B (RBM for TDI)	4.1:2
Task 3:41 DVB-T2: Input Mode B (RBM for DJB)	4.1:2
Task 3:42 DVB-T2: Input Mode B (RBM when FEF present)	4.1:2
Task 3:43 DVB-T2: Normal mode (NM)	4.1:2
Task 3:44 DVB-T2: Input Mode A (zero power FEF present)	4.1:2
Task 3:45 DVB-T2: Input Mode A (RBM when FEF present)	4.1:2
Task 3:46 DVB-T2: Auxiliary streams	4.1:2
Task 3:47 DVB-T2: Reception of version 1.1.1	4.1:2
Task 3:48 DVB-T2: Tuning/Scanning Procedures: Automatic channel search for the same service bouquet	4.1:2
Task 3:49 DVB-T2: Tuning/Scanning Procedures: Basic status check	4.1:2
Task 3:50 DVB-T2: Verification of Signal Strength Indicator (SSI)	4.1:2
Task 3:51 DVB-T2: Verification of Signal Quality Indicator (SQI)	4.1:2
Task 3:52 DVB-T2: Changes In Modulation Parameters	4.1:2
Task 3:53 DVB-T2: Time interleaving	4.1:2
Task 3:54 DVB-T2: Input/Output Data Formats	4.1:2
Task 3:55 DVB-T2: Performance: BER vs C/N verification	4.1:2
Task 3:56 DVB-T2: Performance: C/N performance on Gaussian channel	4.1:2
Task 3:57 DVB-T2: Performance: C/N performance on 0dB echo channel	4.1:2
Task 3:58 DVB-T2: Performance: Minimum receiver signal input levels on Gaussian channel	4.1:2
Task 3:59 DVB-T2: Performance: Minimum IRD Signal Input Levels on 0dB echo channel	4.1:2
Task 3:60 DVB-T2: Performance: Receiver noise figure on Gaussian channel	4.1:2
Task 3:61 DVB-T2: Performance: Maximum Receiver Signal Input Levels	4.1:2
Task 3:62 DVB-T2: Performance: Immunity to “digital” signals in Other Channels	4.1:2
Task 3:63 DVB-T2: Performance: Immunity to “LTE 700MHz” signals in Other Channels	4.1:2
Task 3:64 DVB-T2: Performance: Immunity to “LTE 800MHz” signals in Other Channels	4.1:2
Task 3:65 DVB-T2: Performance: Performance in Time-Varying Channels	4.1:2
Task 3:66 DVB-T2: Performance: Synchronisation for varying echo power levels in SFN	4.1:2
Task 3:67 DVB-T2: Performance: C/(N+I) Performance in SFN for more than one echo	4.1:2
Task 3:68 DVB-T2: Performance: C/(N+I) Performance in SFN inside the guard interval	4.1:2
Task 3:69 DVB-T2: Performance: C/(N+I) Performance in SFN outside the guard interval	4.1:2
Task 5:4 Number of elementary streams	4.1:4
Task 5:6 Variable Bitrate Elementary Streams	4.1:4
Task 5:7 Mixture of SD and HD services	4.1:4
Task 5:9 System clock recovery	4.1:4
Task 6:2 Video Decoder – Resolutions and Frame rates	4.1:5
Task 6:3 Up-sampling/Up-conversion	4.1:5
Task 6:5 Video Decoder - Dynamic changes in video stream	4.1:5
Task 6:6 Video Decoder - AVC still picture	4.1:5
Task 6:7 Minimum video bandwidth	4.1:5
Task 6:8 Frame cropping	4.1:5
Task 6:9 Overscan	4.1:5
Task 6:12 16:9 displayed on 4:3 monitors	4.1:5
Task 6:13 Displaying 4:3 Material on 16:9 Monitors	4.1:5
Task 7:3 MPEG-1 Layer II: Analogue audio output	4.1:6
Task 7:4 MPEG-1 Layer II: HDMI output interface	4.1:6

NorDig Test Plan 2.6.0 task	FiCom task(s)
Task 7:5 MPEG-1 Layer II: S/PDIF output interface	4.1:6
Task 7:6 AC-3: Requirements	4.1:6
Task 7:7 AC-3: Analogue audio output	4.1:6
Task 7:8 AC-3: HDMI output and HDMI ARC interface	4.1:6
Task 7:9 AC-3: S/PDIF output interface	4.1:6
Task 7:11 E-AC-3: Requirements	4.1:6
Task 7:12 E-AC-3: Analogue audio output	4.1:6
Task 7:13 E-AC-3: HDMI output and HDMI ARC interface	4.1:6
Task 7:14 E-AC-3: S/PDIF output interface	4.1:6
Task 7:15 E-AC-3: Metadata	4.1:6
Task 7:16 HE AAC: Requirements	4.1:6
Task 7:17 HE AAC: Analogue audio output	4.1:6
Task 7:18 HE AAC: HDMI output and HDMI ARC interface	4.1:6
Task 7:19 HE AAC: S/PDIF output interface	4.1:6
Task 7:20 HE AAC: Metadata	4.1:6
Task 7:21 Audio prioritizing - Audio language support	4.1:6
Task 7:22 Audio Prioritising – audio format and stream type	4.1:6
Task 7:23 Audio Prioritising – audio type	4.1:6
Task 7:24 Audio Prioritising – audio format signaling missing	4.1:6
Task 7:25 Audio video synchronization	4.1:6
Task 7:26 Adjustement of Video/audio-delay	4.1:6
Task 7:27 Audio handling when changing service or audio format	4.1:6
Task 7:28 Dynamic changes in audio components	4.1:6
Task 7:29 Audio descriptors	4.1:6
Task 7:30 Clean audio	4.1:6
Task 7:31 Supplementary audio	4.1:6
Task 7:32 IRD Internal Reference Level	4.1:6
Task 7:33 Loudness levels - Audio Output Levels	4.1:6
Task 8:1 Subtitling - user preferences	9.0:1
Task 8:2 Subtitling - Only display subtitling if match language in user preferences	9.0:1
Task 8:3 Subtitling - Temporary changes to subtitling settings	9.0:1
Task 8:5 Subtitling – DVB Subtitling and subtitling priority (DVB/EBU)	9.0:1
Task 8:8 Teletext – EBU Teletext level 1.5	9.0:1
Task 8:9 Teletext - decoding method(VBI)	9.0:1
Task 8:10 Teletext decoding method(OSD)	9.0:1
Task 8:11 Teletext – teletext pages	9.0:1
Task 8:12 Teletext – teletext pages - cache	9.0:1
Task 8:14 Subtitling – DVB Subtitling	9.0:1
Task 9:2 SCART Interface	4.1:7
Task 9:3 HDMI interface – HD Ready	4.1:7
Task 9:4 HDMI interface – EDID information	4.1:7
Task 9:5 HDMI interface – Original format	4.1:7
Task 9:6 HDMI – Manual setting for resolution	4.1:7
Task 9:7 HDMI – Signal protection	4.1:7
Task 9:8 Analogue video interface(Option)	4.1:7
Task 9:9 Remote Control Function Keys	4.1:7
Task 9:10 Remote Control Function Keys for PVR	4.1:7
Task 10:1 Use of Common Interface	4.1:8
Task 10:2 Smart Card Interface	4.1:9

NorDig Test Plan 2.6.0 task	FiCom task(s)
Task 11:1 IRD System software update using DVB SSU simple profile	8.0:2, 8.0:3
Task 11:3 IRD System software update using DVB SSU Notifications update type 0x4	8.0:2, 8.0:3
Task 11:4 SSU end user functionality	8.0:2, 8.0:3
Task 11:5 Common interface plus (CI+) CAM module system software update	8.0:4, 8.0:5
Task 13:5 SI: Text strings and field size of the SI descriptor	6.0:1
Task 13:7 NIT_actual – Missing terrestrial_system_delivery_descriptor	6.0:1
Task 13:8 NIT_actual – Missing T2_delivery_system_descriptor	6.0:1
Task 13:10 Quasi static update of SDT_actual	6.1:1
Task 13:11 Quasi-static update of SDT_actual – linkage to NorDig simulcast replacement service	6.1:1
Task 13:16 Dynamic update of SDT_actual running status and linkage to a service replacement service	6.0:1
Task 13:17 Dynamic update of EIT actual/other p/f	6.3:1
Task 13:19 Dynamic update of EIT actual/other p/f short_event_descriptor, extended_event_descriptor and content_descriptor	6.3:1
Task 13:20 Dynamic update of EIT actual/other p/f content descriptor and component_descriptor	6.3:1
Task 13:21 Dynamic update of EIT actual/other p/f parental_rating_descriptor	6.3:1
Task 13:22 Dynamic update of EIT actual/other p/f and schedule in ESG using linkage	6.3:1
Task 13:23 Dynamic update of EIT actual/other p/f and schedule in ESG	6.3:1
Task 13:24 PMT Descriptors - General	6.0:1
Task 13:26 Dynamic update of PMT PID values	6.0:1
Task 13:27 Dynamic update of PMT-Component priority (stream type)	6.0:1
Task 13:29 Dynamic update of TDT/TOT	6.4:1
Task 14:3 Service list – service types and categories	6.0:1
Task 14:5 Service list - Inconsistent of SDT_actual and NIT_actual information	6.0:1
Task 14:7 Service list – NIT_actual original_network_ID	6.0:1
Task 14:8 Service list – NIT_actual network_ID	6.0:1
Task 14:11 Service list – Simultaneous transmission of LCD v1 and v2	6.0:1
Task 14:13 Service list - Priority of LCN between SD and HDTV services	6.0:1
Task 14:14 Quasi-static update of service list – service addition	6.1:1
Task 14:15 Quasi-static update of service list – non-visible data service addition	6.1:1
Task 14:16 Quasi-static update of service list – services moved between different transport streams	6.1:1
Task 14:17 Quasi-static update of service list – service remove	6.1:1
Task 14:18 Quasi-static update of service list from NIT_actual for non-existing multiplexers	6.1:1
Task 14:19 Quasi-static update of service list from NIT_actual for removing a multiplex	6.1:1
Task 14:20 Quasi-static update of NorDig LCN v1	6.1:1
Task 14:21 Quasi-static update of NorDig LCN v2	6.1:1
Task 15:2 Recording capacity	14.1:1
Task 15:3 Deletion of the recordings	14.1:1
Task 15:4 Failed and incomplete recordings	14.1:1
Task 15:5 File system intact after update	14.1:1
Task 15:6 Limitations in recorded content – no extraction	14.1:1
Task 15:7 Limitations in recorded content – downscaling of the HD content to the removable media	14.1:1
Task 15:8 Disk Management	14.1:1
Task 15:9 General PVR recording – bitrates	14.1:1
Task 15:10 General PVR recording – service types	14.1:1

NorDig Test Plan 2.6.0 task	FiCom task(s)
Task 15:11 ESG/EPG recording programming – individual events without CRID	14.1:1
Task 15:19 Accurate Recording – EIT information present	14.1:1
Task 15:20 Accurate Recording – EIT information missing	14.1:1
Task 15:21 Accurate Recording – Loss of signal	14.1:1
Task 15:22 Accurate Recording – EIT update in stand-by	14.1:1
Task 15:23 Simultaneous recording – OTR and viewing	14.1:1
Task 15:24 Simultaneous recording – Scheduled recording and viewing	14.1:1
Task 15:25 Simultaneous recording – OTR and time-shift	14.1:1
Task 15:26 Simultaneous recording – Scheduled recording and time-shift	14.1:1
Task 15:27 Simultaneous recording and playback	14.1:1
Task 15:28 Back-to-back recordings – Static EIT information	14.1:1
Task 15:29 Back-to-back recordings – Changes in EIT information	14.1:1
Task 15:30 Timeshift recording	14.1:1
Task 15:31 Manual recording	14.1:1
Task 15:32 Manual recording – Changes in TDT/TOT	14.1:1
Task 15:33 One Touch Recording (OTR)	14.1:1
Task 15:34 Automatic Conflict Handling – During programming	14.1:1
Task 15:35 Automatic Conflict Handling – After programming	14.1:1
Task 15:36 Maximum length of recordings	14.1:1
Task 15:38 Playback - General	14.1:1
Task 15:39 Replay/Playback – trick modes in playback	14.1:1
Task 15:40 Replay/Playback – trick modes in timeshift	14.1:1
Task 15:41 Relative synchronisation	14.1:1
Task 15:42 Full service playback – Dynamic update of PMT audio language	14.1:1
Task 15:43 Full service playback – Dynamic update of PMT audio format	14.1:1
Task 15:44 Full service playback – Dynamic update of PMT audio type	14.1:1
Task 15:45 Full service playback – Dynamic update of PMT subtitling language	14.1:1
Task 15:46 Full service playback – Subtitling for the hard-of-hearing	14.1:1
Task 15:47 Full service playback – Dynamic update of PMT subtitling type	14.1:1
Task 15:48 Full service playback – Subtitling syncrhonization	14.1:1
Task 15:49 Full service playback – Subtitling synchronization in time-shift	14.1:1
Task 15:50 Full service playback – Dynamic update of PMT video and audio PIDs	14.1:1
Task 15:51 Full service playback – Dynamic update of video aspect ratio	14.1:1
Task 1552 Full service playback – Dynamic update of PMT CA status	14.1:1
Task 15:53 Dynamic changes in video stream in playback	14.1:1
Task 15:54 Parental lock during playback	14.1:1
Task 15:55 Maintaining scheduled recordings after network update	14.1:1
Task 15:56 User actions disturbing the recording	14.1:1
Task 17:1 Stored preferences	10.0:1
Task 17:2 Deletion of service lists	10.0:1
Task 17:3 Reset to factory mode	10.0:1

4 Test tasks

FiCom-4. General IRD Requirements

Test Case	**FiCom-4.1:1 Terrestrial – DVB-T RF performance - NorDig**
Section	FiCom Unified, Chapter 4.1
Requirement	4.1-1
Test Procedure	**Purpose of test:** To verify IRD RF performance in DVB-T conditions of Finland. To verify the IRD RF performance against NorDig Unified [3] requirements. **Equipment:** See NorDig Test Plan 2.6.0 tasks 3:1 – 3:32. Test points using DVB-T mode 8k 64QAM R=2/3 Δ/Tu=1/8 on UHF IV and UHF-V frequency bands are applicable and shall be performed. Other DVB-T modes are not used in Finland and are optional. Test points using other DVB-T modes and frequency bands are optional. **Test Procedure:** NorDig Test Plan 2.6.0 tasks 3:1 – 3:32. **Measurement record:** **Test Point** | **OK/NOK** IRD passes the NorDig Test Plan 2.6.0 test points in tasks 3:1 – 3:32 for DVB-T mode 8k 64QAM R=2/3 Δ/Tu=1/8 on UHF IV and UHF-V frequency bands. | IRD passes the NorDig Test Plan 2.6.0 test points for other DVB-T modes and frequency bands (optional) | **Expected Result:** IRD correctly conforms to the applicable DVB-T RF requirements in NorDig Unified.
Test Result(s)	
Conformity	☐ OK | Fault | ☐ Major ☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:
Date	| Sign |

Test Case	**FiCom-4.1:2 Terrestrial – DVB-T2 RF performance - NorDig**
Section	FiCom Unified, Chapter 4.1, 5.2
Requirement	4.1-1, 5.2.4
Test Procedure	**Purpose of test:** To verify IRD RF performance in DVB-T2 conditions of Finland.

	To verify the IRD RF performance against NorDig Unified [3] requirements. **Equipment:** See NorDig Test Plan 2.6.0 tasks 3:33 – 3:69. **Test Procedure:** See NorDig Test Plan 2.6.0. **Measurement record:** **Test Point** | **OK/NOK** IRD passes the NorDig Test Plan 2.6.0 test points in tasks 3:33 – 3:69 | **Expected Result:** IRD correctly conforms to the applicable DVB-T2 RF requirements in NorDig Unified.
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:
Date	Sign

Test Case	**FiCom-4.1:3 Cable – DVB-C RF performance - NorDig**
Section	FiCom Unified, Chapter 4.1
Requirement	4.1-2
Test Procedure	**Purpose of test:** To verify IRD RF performance in DVB-C conditions of Finland. To verify the IRD RF performance against NorDig Unified [3] requirements. **Equipment:** See NorDig Test Plan 2.6.0 tasks 2:1 – 2:7, 2:10, 2:13 – 2:18, 2:20 – 2:22. **Test Procedure:** See NorDig Test Plan 2.6.0. **Measurement record:** **Test Point** | **OK/NOK** IRD passes the NorDig Test Plan 2.6.0 test tasks 2:1 – 2:7, 2:10, 2:13-2:18 and 2:20 – 2:22. | **Expected Result:** IRD correctly conforms to the applicable DVB-C RF requirements in NorDig Unified.
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments

Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:		
Date		Sign	

Test Case	**FiCom-4.1:4 MPEG-2 Demultiplexer - NorDig**			
Section	FiCom Unified, Chapter 4.1			
Requirement	4.1			
Test Procedure	**Purpose of test:** To verify the IRD demultiplexer performance against NorDig Unified [3] requirements. **Equipment:** See NorDig Test Plan 2.6.0 tasks 5:4, 5:6, 5:7, 5:9 **Test Procedure:** See NorDig Test Plan 2.6.0 tasks 5:4, 5:6, 5:7, 5:9 **Measurement record:** **Test Point** / **OK/NOK** Task 5:4 Number of elementary streams Task 5:6 Variable Bitrate Elementary Streams Task 5:7 Mixture of SD and HD services Task 5:9 System clock recovery **Expected Result:** IRD correctly conforms to the applicable demultiplexer requirements in NorDig Unified.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-4.1:5 Video - NorDig**
Section	FiCom Unified, Chapter 4.1
Requirement	4.1-3
Test Procedure	**Purpose of test:** To verify the IRD video performance against NorDig Unified [3] requirements. **Equipment:** See NorDig Test Plan 2.6.0 tasks 6:2, 6:3, 6:5 – 6:9, 6:12, 6:13 **Test Procedure:**

See NorDig Test Plan 2.6.02.6.0 tasks 6:2, 6:3, 6:5 – 6:9, 6:12, 6:13

Measurement record:

Test Point	**OK/NOK**
Task 6:2 Video Decoder – Resolutions and Frame rates	
Task 6:3 Up-sampling/Up-conversion	
Task 6:5 Video Decoder - Dynamic changes in video stream	
Task 6:6 Video Decoder - AVC still picture	
Task 6:7 Minimum video bandwidth	
Task 6:8 Frame cropping	
Task 6:9 Overscan	
Task 6:12 16:9 displayed on 4:3 monitors	
Task 6:13 Displaying 4:3 Material on 16:9 Monitors	

Expected Result:
IRD correctly conforms to the applicable Video requirements in NorDig Unified.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-4.1:6 Audio - NorDig**
Section	FiCom Unified, Chapter 4.1
Requirement	4.1-4
Test Procedure	**Purpose of test:** To verify the IRD video performance against NorDig Unified [3] requirements. **Equipment:** See NorDig Test Plan 2.6.02.6.0 tasks 7:3 – 7:9, 7:11 – 7:33 **Test Procedure:** See NorDig Test Plan 2.6.0 tasks 7:3 – 7:9, 7:11 – 7:33 **Measurement record:**

Test Point	**OK/NOK**
Task 7:3 MPEG-1 Layer II: Analogue audio output	
Task 7:4 MPEG-1 Layer II: HDMI output interface	
Task 7:5 MPEG-1 Layer II: S/PDIF output interface	
Task 7:6 AC-3: Requirements	
Task 7:7 AC-3: Analogue audio output	
Task 7:8 AC-3: HDMI output and HDMI ARC interface	
Task 7:9 AC-3: S/PDIF output interface	
Task 7:11 E-AC-3: Requirements	
Task 7:12 E-AC-3: Analogue audio output	
Task 7:13 E-AC-3: HDMI output and HDMI ARC interface	

Task 7:14 E-AC-3: S/PDIF output interface	
Task 7:15 E-AC-3: Metadata	
Task 7:16 HE AAC: Requirements	
Task 7:17 HE AAC: Analogue audio output	
Task 7:18 HE AAC: HDMI output and HDMI ARC interface	
Task 7:19 HE AAC: S/PDIF output interface	
Task 7:20 HE AAC: Metadata	
Task 7:21 Audio prioritizing - Audio language support	
Task 7:22 Audio Prioritising – audio format and stream type	
Task 7:23 Audio Prioritising – audio type	
Task 7:24 Audio Prioritising – audio format signaling missing	
Task 7:25 Audio video synchronization	
Task 7:26 Adjustement of Video/audio-delay	
Task 7:27 Audio handling when changing service or audio format	
Task 7:28 Dynamic changes in audio components	
Task 7:29 Audio descriptors	
Task 7:30 Clean audio	
Task 7:31 Supplementary audio	
Task 7:32 IRD Internal Reference Level	
Task 7:33 Loudness levels - Audio Output Levels	

Expected Result:
IRD correctly conforms to the applicable Audio requirements in NorDig Unified.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-4.1:7 Interfaces and Signal levels – NorDig**
Section	FiCom Unified, Chapter 4.1, 4.2
Requirement	4.1-7, 4.2
Test Procedure	**Purpose of test:** To verify the IRD interfaces against NorDig Unified [3] requirements. **Equipment:** See NorDig Test Plan 2.6.0 tasks 9:2 – 9:10 **Test Procedure:**

See NorDig Test Plan 2.6.0 tasks 9:2 – 9:10

Measurement record:

Test Point	**OK/NOK**
Task 9:2 SCART Interface	
Task 9:3 HDMI interface – HD Ready	
Task 9:4 HDMI interface – EDID information	
Task 9:5 HDMI interface – Original format	
Task 9:6 HDMI – Manual setting for resolution	
Task 9:7 HDMI – Signal protection	
Task 9:8 Analogue video interface(Option)	
Task 9:9 Remote Control Function Keys	
Task 9:10 Remote Control Function Keys for PVR	

Expected Result:
IRD correctly conforms to the applicable interface requirements in NorDig Unified.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-4.1:8 CI+ interface and interoperability with CI+CAM modules**
Section	FiCom Unified, Chapter 4.1
Requirement	4.1-5
Test Procedure	**Purpose of test:** To verify IRD compatibility with NorDig Unified requirements for Common Interface. To verify IRD interoperability with CI+CAMs certified for Antenna HD Ready and Cable HD Ready. **This test Is applicable for IRDs with Common Interface.** **Equipment:** See Test procedure of NorDig Unified Test Plan v2.6.0 Task 10:1. Live signal IRD under test Certified Antenna HD Ready and Cable HD Ready CI+CAM modules Smartcards with and without subscription This test task may be performed in parallel with the Field test tasks. **Test Procedure:** See the Test procedure of NorDig Unified Test Plan v2.6.0 Task 10:1.

1. Tune into a live network
2. Insert a certified CI+CAM with a smartcard having subscription.
3. Observe IRD behavior in different use-cases:
    a. Entitlement management
    b. Viewing interoperability
    c. Endurance and durability
    d. Zapping performance
    e. Component selection
    f. PVR recording (when applicable)
4. Repeat the test procedure with other certified CI+CAM models
5. Insert a certified CI+CAM with a smartcard having no subscription.
6. Repeat test step 3.
7. Fill in the measurement record

Measurement record:

Test Point	**OK/NOK**
Task 10:1 Use of Common Interface	
IRD is interoperable with the certified CI+CAMs	

Expected Result:
IRD is interoperable with the certified CI+CAMs.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-4.1:9 Interoperability with CA system**
Section	FiCom Unified, Chapter 4.1
Requirement	4.1-5, 4.1-6
Test Procedure	**Purpose of test:** To verify IRD compatibility with Conax CA system with chipset pairing. To verify IRD interoperability with CI+CAMs certified for Antenna HD Ready and Cable HD Ready. **This test is applicable for IRDs with integrated Conax CAS.** **Equipment:** See Test procedure of NorDig Unified Test Plan v2.6.0 Task 10:2. Live signal IRD under test Smartcards with and without subscription and entitlement This test task may be performed in parallel with the Field test tasks.

Test Procedure:
See the Test procedure of NorDig Unified Test Plan v2.6.0 Task 10:2.

Manufacturer shall guarantee the IRD conforms to the applicable security requirements for HDTV IRD [4].

1. Tune into a live network
2. Insert smartcard with subscription.
3. Observe IRD behavior in different use-cases:
    a. Entitlement management
    b. Endurance and durability
    c. Zapping performance
    d. Component selection
    e. PVR recording (when applicable)
4. Insert smartcard without subscription.
5. Repeat test step 3.
6. Fill in the measurement record

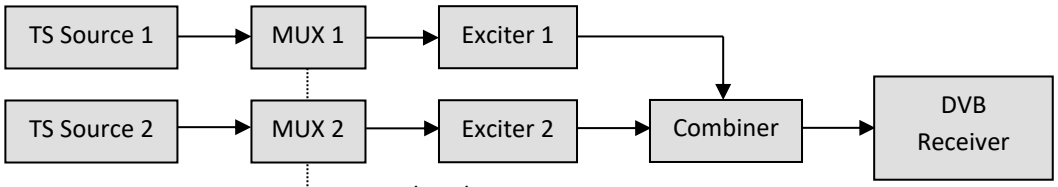
Measurement record:

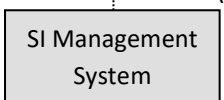
Test Point	OK/NOK
Task 10:2 Smartcard interface	
IRD is interoperable with the CA system of the live network	

Expected Result:
IRD is interoperable with the CA system.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-4.2:1 HEVC Resolutions and framerates**
Section	FiCom Unified, Chapter 4.2
Requirement	HDTV IRD supporting HEVC shall be able to decode HEVC video as per ETSI TS 101 154. UHDTV IRD supporting HEVC shall be able to decode HEVC video as per ETSI TS 101 154. HEVC component shall not cause harm to a IRD not supporting HEVC video.
Test Procedure	**Purpose of test:** To verify IRD ability to handle HEVC video resolutions and framerates. **Equipment:**





Resolutions and framerates (as per Table 21a in ETSI TS 101 154)

Luminance resolution			
Horizontal	**Vertical**	**Interlace/Progressive**	**Frame rates**
3840	2160	P	24, 25, 30, 50, 60
3200	1800	P	24, 25, 30, 50, 60
2560	1440	P	24, 25, 30, 50, 60
1920	1080	P	24, 25, 30, 50, 60
1600	900	P	24, 25, 30, 50, 60
1280	720	P	24, 25, 30, 50, 60
960	540	P	24, 25, 30, 50, 60

Coded Frame aspect ratio is 16:9 for all modes.
Minimum supported bit depth is 8 Bit, at a chroma sub-sampling rate of 4:2:0 for 50p/60p and 4:2:2 for 24p/25p/30p. Minimum supported colorimetry according to BT.709.

Test Procedure:

1. Tune to services with different HEVC resolutions and framerates.
2. Observe the picture quality.
3. Verify that the IRD is able to display HEVC video correctly.

Measurement record:

Test Point	**OK/NOK**
IRD supports HEVC UHD and displays HEVC UHD services correctly.	
IRD supports HEVC HD and displays HEVC HD services correctly.	
IRD does not support HEVC UHD. Unsupported HEVC UHD modes do not cause harm to the receiver.	
IRD does not support HEVC HD. Unsupported HEVC HD modes do not cause harm to the receiver.	

Expected Result:
IRD correctly handles HEVC resolutions and framerates.

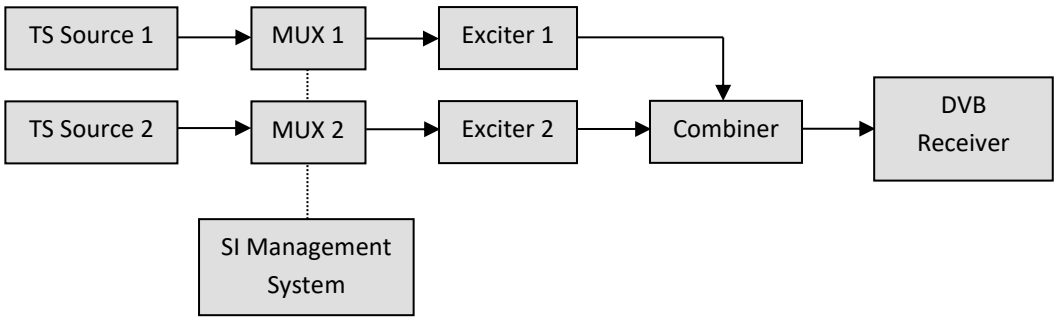
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			

Date		Sign	

Test Case	**FiCom-4.2:2 HEVC Component priority**
Section	FiCom Unified, Chapter 6.2.1
Requirement	4.2-3, 6.2.1-1, 6.2.1-3
Test Procedure	

Purpose of test:
To verify IRD ability to prioritize HEVC video component over AVC video.

Equipment:



Service contains multiple HEVC and AVC video components.

Service	**Video codec A**	**Video codec B**	**Expected selection / IRD type**		
			UHDTV, HEVC	**HDTV, HEVC**	**HDTV, AVC**
Test11	HEVC 3840x2160p	AVC 1920x1080p	A	B	B
Test12	HEVC 3840x2160p	AVC720x576i	A	B	B
Test21	HEVC 1920x1080p	AVC 1920x1080p	A	A	B
Test22	HEVC 1920x1080p	AVC720x576i	A	A	B

The HEVC UHDTV services are of *service_type* 0x1F or 0x20.
HEVC HDTV services are of *service_type* 0x1F.

Test Procedure:

1. Tune to services where multiple two video codecs are signaled.
2. Observe the video content.
3. Verify that the IRD prioritizes HEVC component over AVC, if supported.
4. Fill in the measurement record.

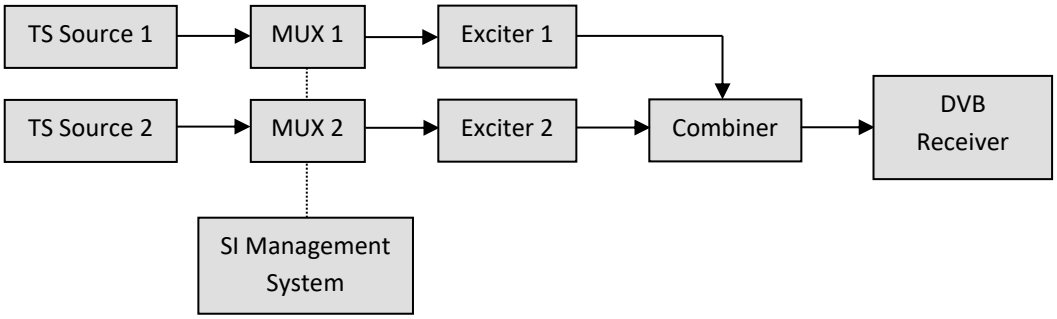
Measurement record:

Test Point	**OK/NOK**
UHDTV IRD supporting HEVC prioritizes always HEVC over AVC.	
HDTV IRD supporting HEVC prioritizes HEVC HDTV over AVC.	
HDTV IRD not supporting HEVC prioritizes AVC over HEVC.	
Unsupported HEVC HD modes do not cause harm to the receiver.	

Expected Result:

	IRD correctly prioritizes HEVC codec over AVC.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-4.3:1 Supplementary Audio Indication**
Section	FiCom Unified, Chapter 4.3
Requirement	4.3-1, 4.3-2
Test Procedure	**Purpose of test:** To verify IRD ability to handle and indicate supplementary audio tracks. *IRD shall select the audio tracks as per NorDig Unified Table 6.1.* **Equipment:**



Transmitter	Service 1	Service 2	Service 3	Frequency
MUX 1 TS_ID 1 Network_ID 1 ON_ID 1)	SID 1100 S_Name Test11 S_Type 0x1 PMT PID 1100 V PID 1109 A PID 1108 (fin, normal) A PID 1107 (dut, suppl.) LCD 1	SID 1200 S_Name Test12 S_Type 0x1 PMT PID 1200 V PID 1209 A PID 1208 (swe, normal) A PID 1207 (fin, suppl.) LCD 2	SID 1300 S_Name Test13 S_Type 0x1 PMT PID 1300 V PID 1309 A PID 1308 (fin, normal) A PID 1307 (dut, suppl.) A PID 1306 (eng, normal AC3) LCD 3	Can be chosen depending of the distribution media.
MUX 2 TS_ID 2 Network_ID 1 ON_ID [1)]	SID 2100 S_Name Test21 S_Type 0x19 PMT PID 2100	SID 2200 S_Name Test22 S_Type 0x19 PMT PID 2200	SID 2300 S_Name Test23 S_Type 0x19 PMT PID 2300	Can be chosen depending of the distribution media.

	V PID 2109 A PID 2108 (fin, normal) A PID 2107 (fin, suppl.) LCD 4	V PID 2209 A PID 2208 (fin, normal) A PID 2207 (dut, suppl.) LCD 5	V PID 2309 A PID 2308 (fin, normal) A PID 2307 (swe, normal) A PID 2306 (dut, suppl.) LCD 6	

1) ON_id (Original_network_id) shall be 0x20F6 for Terrestrial and any in range 0x0001-0xfe00 (operational network) for Cable.

Supplementary audio tracks shall be signalized as per FiCom Unified v4.0 [1] Annex A.

Audio tracks in MPEG2-SD services shall be MPEG1L2 or AC-3.
Audio tracks in MPEG4-SD services shall be HE-AACv1L2.
Audio tracks in MPEG4-HD services shall be AC3.
Audio component configurations in PMT may be changed dynamically.

Test Procedure:

1. Tune to Test11.
2. Disable supplementary audio user preference.
3. Access the IRD navigator, info banner and ESG/EPG.
4. Look for a supplementary audio indicator.
5. Access the list of the selectable audio tracks on the service.
6. Look for a supplementary audio indicator.
7. Repeat steps 3-6 on the other services in the test network.
8. Enable supplementary audio user preference.
9. Verify that the IRD indicates the supplementary audio tracks, when available.
10. Fill in the measurement record.

Measurement record:

Test Point	**OK/NOK**
IRD indicates if supplementary audio tracks are available on the service.	
IRD indicates which audio tracks are of a supplementary type.	

Expected Result:
IRD correctly handles the indication of supplementary audio tracks.

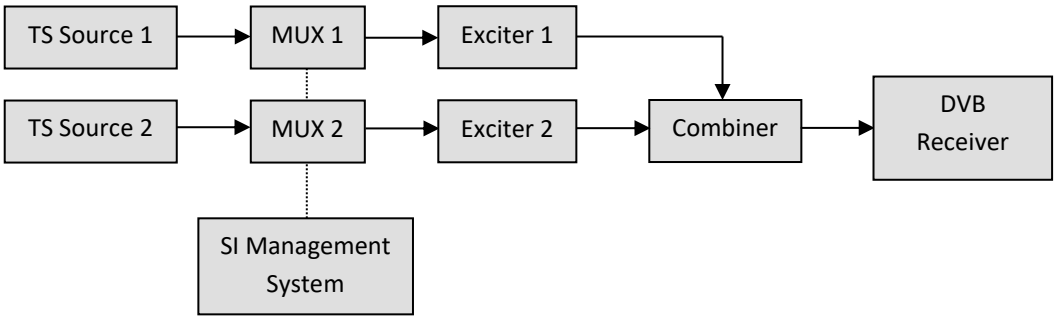
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-4.3:2 Dynamic Update of PMT: Supplementary Audio**
Section	FiCom Unified, Chapter 4.3, NorDig Unified, Chapter 6
Requirement	4.3, 4.3-1, 4.3-2
Test Procedure	**Purpose of test:**

To verify IRD ability to handle and indicate supplementary audio tracks.

This test task is a Finland-specific substitute to NorDig Test Plan 2.6.0 task 7:31.
IRD shall select the audio tracks as per NorDig Unified 2.6.0 Table 6.1.

Equipment:



Transmitter	Service 1	Service 2	Service 3	Frequency
MUX 1 TS_ID 1 Network_ID 1 ON_ID [1)]	SID 1100 S_Name Test11 S_Type 0x1 PMT PID 1100 V PID 1109 A PID 1108 (fin, normal) A PID 1107 (dut, suppl.) LCD 1	SID 1200 S_Name Test12 S_Type 0x1 PMT PID 1200 V PID 1209 A PID 1208 (swe, normal) A PID 1207 (fin, suppl.) LCD 2	SID 1300 S_Name Test13 S_Type 0x1 PMT PID 1300 V PID 1309 A PID 1308 (fin, normal) A PID 1307 (dut, suppl.) A PID 1306 (eng, normal AC3) LCD 3	Can be chosen depending of the distribution media.
MUX 2 TS_ID 2 Network_ID 1 ON_ID [1)]	SID 2100 S_Name Test21 S_Type 0x19 PMT PID 2100 V PID 2109 A PID 2108 (fin, normal) A PID 2107 (fin, suppl.) LCD 4	SID 2200 S_Name Test22 S_Type 0x19 PMT PID 2200 V PID 2209 A PID 2208 (fin, normal) A PID 2207 (dut, suppl.) LCD 5	SID 2300 S_Name Test23 S_Type 0x19 PMT PID 2300 V PID 2309 A PID 2308 (fin, normal) A PID 2307 (swe, normal) A PID 2306 (dut, suppl.) LCD 6	Can be chosen depending of the distribution media.

1) ON_id (Original_network_id) shall be 0x20F6 for Terrestrial and any in range 0x0001-0xfe00 (operational network) for Cable.

Audio tracks in MPEG2-SD services shall be MPEG1L2 or AC-3.
Audio tracks in MPEG4-HD services shall be AC3.
Audio component configurations in PMT may be changed dynamically.
Supplementary audio tracks shall be signalized as per FiCom Unified v4.0 [1] Annex A.

Test Procedure:

1. Perform factory reset and new channel search.
2. Verify that visual impaired audio is disabled at the user preferences.
3. Select Finnish as the primary audio language and Swedish as the secondary audio language at the user preferences.
4. Zap through the services in the test multiplexes.
5. Verify that IRD plays out the 'normal' audio.
6. Select Dutch as the secondary audio language.
7. Verify that IRD plays out the 'normal' audio.
8. Verify that Visual Impaired audio track is manually selectable.
9. Select Finnish as the primary audio language and Swedish as the secondary audio language at the user preferences.
10. Zap through the services in the test multiplexes.
11. Enable visual impaired audio.
12. Verify that IRD plays out the 'visual impaired' audio if primary/secondary language matches with the user preferences.
13. Verify that IRD plays out the 'normal' audio if primary/secondary language does not match with the user preferences.
14. Fill in the measurement record.

Measurement record:

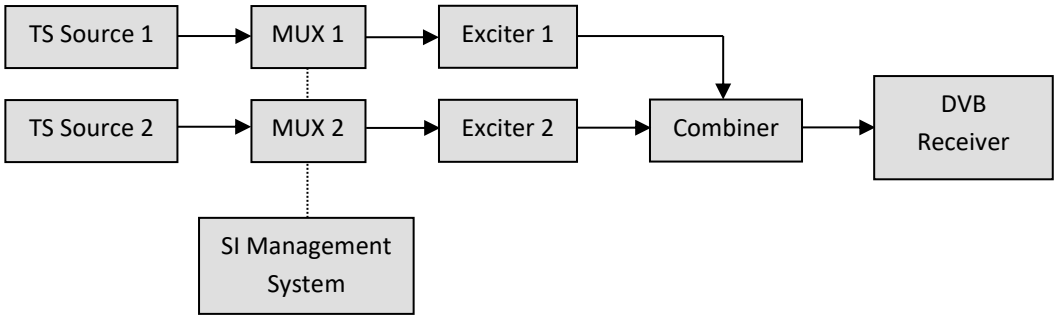
Test Point	**OK/NOK**
User preference for Visual impaired audio is disabled by default	
Visual impaired audio track is manually selectable regardless of the user preference setting value	
IRD prioritizes Normal audio over Visual Impaired audio, if Visual Impaired audio is disabled at the user preferences.	
IRD prioritizes Visual Impaired audio over Normal audio, if Visual Impaired audio is enabled at the user preferences and audio language matches with the primary/secondary language.	

Expected Result:
IRD correctly handles supplementary audio signalization.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

FiCom-5. IRD Installation and Digital television networks in Finland

Test Case	**FiCom-5.1:1 IRD installation**
Section	FiCom Unified, Chapter 5.1
Requirement	5.1-1 – 5.1.4-2
Test Procedure	**Purpose of test:** To verify that the IRD first installation procedure. **Equipment:**



Transmitter	Service 1	Service 2	Service 3	Frequency
MUX 1 TS_ID 1 Network_ID 1 ON_ID [1)]	SID 1100 S_Name Test11 PMT PID 1100 V PID 1109 A PID 1108 LCD 1	SID 1200 S_Name Test12 PMT PID 1200 V PID 1209 A PID 1208 LCD 2	SID 1300 S_Name Test13 PMT PID 1300 V PID 1309 A PID 1308 LCD 3	Can be chosen depending of the distribution media.
MUX 2 TS_ID 2 Network_ID 1 ON_ID [1)]	SID 2100 S_Name Test21 PMT PID 2100 V PID 2109 A PID 2108 LCD 4	SID 2200 S_Name Test22 PMT PID 2200 V PID 2209 A PID 2208 LCD 5	SID 2300 S_Name Test23 PMT PID 2300 V PID 2309 A PID 2308 LCD 6	Can be chosen depending of the distribution media.

1) ON_id (Original_network_id) shall be 0x20F6 for Terrestrial and any in range 0x0001-0xfe00 (operational network) for Cable.

Test Procedure:

1. Perform factory reset.
2. Power cycle the IRD.
3. Verify that the IRD initiates the first installation procedure.
4. Walk through the first installation procedure with Finnish locale.
5. Verify that the first installation procedure is implemented as specified.
6. Fill in the measurement record.

Measurement record:

Test Point	**OK/NOK**
First installation includes a language selection dialogue	
Finnish, Swedish and English are selectable as the Navigator language	
Primary languages for audio and subtitling are selectable or set by the user selection	
Finland is either set or selectable as the selected country / region	
First installation includes a signal source selection dialogue	
First installation includes automatic scan as the default scan type	
Automatic channel scan searches only digital channels by default	

Expected Result:

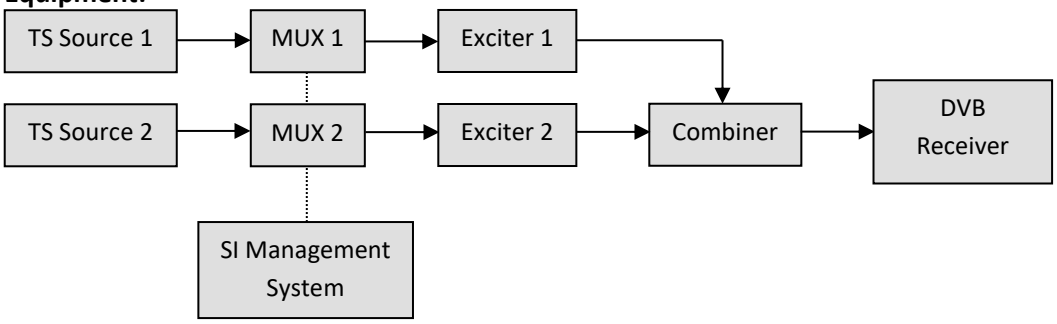
IRD first installation is a guided procedure and includes the required steps.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments

Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:		
Date		Sign	

Test Case	**FiCom-5.2:1 Terrestrial: Automatic scan**
Section	FiCom Unified, Chapter 5.2.1
Requirement	5.2.1-1 – 5.2.1-6
Test Procedure	**Purpose of test:** To verify that the IRD first installation procedure.

Equipment:



Test streams or live signal may be used.

Stopwatch is required for the search duration evaluation.
This test may be performed in parallel with tasks *FiCom-6.1:1* and *FiCom-16.0:1* .

Transmitter	Service 1	Service 2	Service 3	Frequency
MUX 1 TS_ID 1 Network_ID 1 ON_ID [1)]	SID 1100 S_Name Test11 PMT PID 1100 V PID 1109 A PID 1108 LCD 1	SID 1200 S_Name Test12 PMT PID 1200 V PID 1209 A PID 1208 LCD 2	SID 1300 S_Name Test13 PMT PID 1300 V PID 1309 A PID 1308 LCD 3	Can be chosen depending of the distribution media.
MUX 2 TS_ID 2 Network_ID 1 ON_ID [1)]	SID 2100 S_Name Test21 PMT PID 2100 V PID 2109 A PID 2108 LCD 4	SID 2200 S_Name Test22 PMT PID 2200 V PID 2209 A PID 2208 LCD 5	SID 2300 S_Name Test23 PMT PID 2300 V PID 2309 A PID 2308 LCD 6	Can be chosen depending of the distribution media.

1) ON_id (Original_network_id) shall be 0x20F6 for Terrestrial and any in range 0x0001-0xfe00 (operational network) for Cable.

Test Procedure:

1. Access the IRD navigator.
2. Start the stopwatch.
3. Initiate Terrestrial automatic scan.

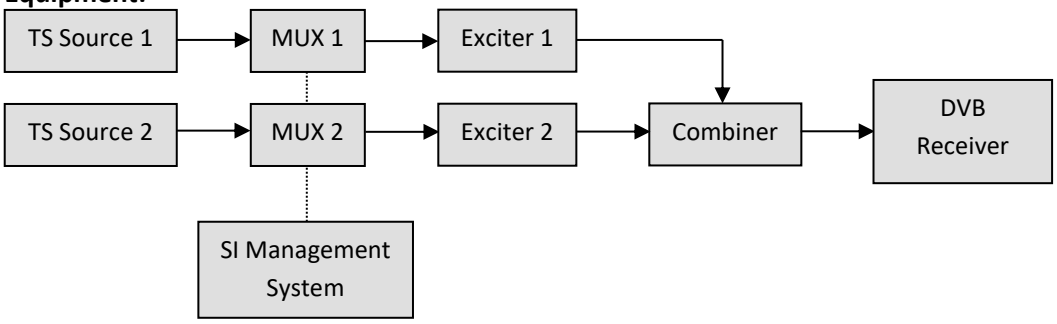
4. Wait until automatic scan is completed.
5. Stop the stopwatch.
6. Fill in the measurement record.

Measurement record:

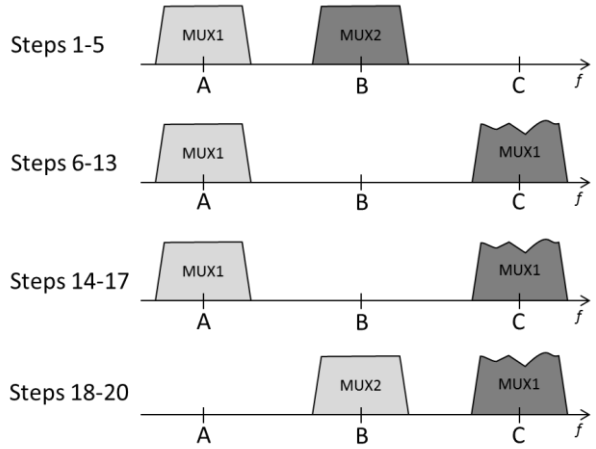
Test Point	OK/NOK
IRD has a menu item for automatic scan	
IRD searches through VHF III band using 7MHz raster	
IRD searches through UHF IV and UHF V bands using 8MHz raster	
IRD scans both DVB-T and DVB-T2.	
IRD detects and reacts to SI changes after automatic scan	
Automatic scan procedure is completed within 15 minutes in typical conditions.	

Expected Result:
Automatic scan works as expected.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-5.2:2 Terrestrial: Manual scan**
Section	FiCom Unified, Chapter 5.2.2
Requirement	5.2.2-1 – 5.2.2-4
Test Procedure	**Purpose of test:** To verify that the IRD manual scan. **Equipment:**  Two TS sources with exciters having controllable level / signal quality are required. ONID of the two networks shall be 0x20F6.

Test procedure MUX / Exciter / Frequency configuration



Transmitter	Service 1	Service 2	Service 3	Frequency
MUX 1 TS_ID 1 Network_ID 1 ON_ID [1)]	SID 1100 S_Name Test11 PMT PID 1100 V PID 1109 A PID 1108 LCD 1	SID 1200 S_Name Test12 PMT PID 1200 V PID 1209 A PID 1208 LCD 2	SID 1300 S_Name Test13 PMT PID 1300 V PID 1309 A PID 1308 LCD 3	According to test procedure
MUX 2 TS_ID 2 Network_ID 1 ON_ID [1)]	SID 2100 S_Name Test21 PMT PID 2100 V PID 2109 A PID 2108 LCD 4	SID 2200 S_Name Test22 PMT PID 2200 V PID 2209 A PID 2208 LCD 5	SID 2300 S_Name Test23 PMT PID 2300 V PID 2309 A PID 2308 LCD 6	According to test procedure

1) ON_id (Original_network_id) shall be 0x20F6 for Terrestrial and any in range 0x0001-0xfe00 (operational network) for Cable.

Test Procedure:

1. Broadcast MUX 1 on carrier CH X (Exciter 1), center frequency A.
2. Broadcast MUX 2 on carrier CH Y (Exciter 2), center frequency B.
3. Set signal quality of both carriers to meet QMP2 reception quality.
4. Perform factory reset and new automatic scan.
5. Verify the IRD finds all services from both multiplexes.

6. Disconnect MUX 2 from CH Y.
7. Broadcast MUX 1 on two different carriers CH X and CH Y.
8. Change center frequency of carrier CH Y to frequency C.
9. Set signal quality of carrier CH X to meet QMP2 reception quality.
10. Set signal quality of carrier CH Y to meet QMP1 reception quality.
11. Perform manual scan on carrier CH Y.
12. Verify the services from MUX1 are originating from the carrier CH Y.
13. Verify the services from MUX1 are found on the service list, on their correct channel number positions.

14. Update the PSI/SI information on the MUX 1, e.g. add a service to NIT.
15. Disconnect MUX 1 from CH X.
16. Provoke the IRD to perform a quasi-static update procedure.
    (That is, perform the actions usually required to trigger an automatic channel list update.).
17. Verify the IRD does *not* perform an automatic channel list update.

18. Broadcast MUX 2 on carrier CH X, center frequency B.
19. Verify the IRD service list contains services from both MUX1 and MUX2.
20. Fill in the measurement record.

Measurement record:

Test Point	**OK/NOK**
The services in a MFN network are listed only once.	
IRD requires from the user no other tuning parameters than center frequency or channel ID.	
Manual scan disables automatic service list updates	
Manual scan does not clear the service list	

Expected Result:
Manual scan works as expected.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

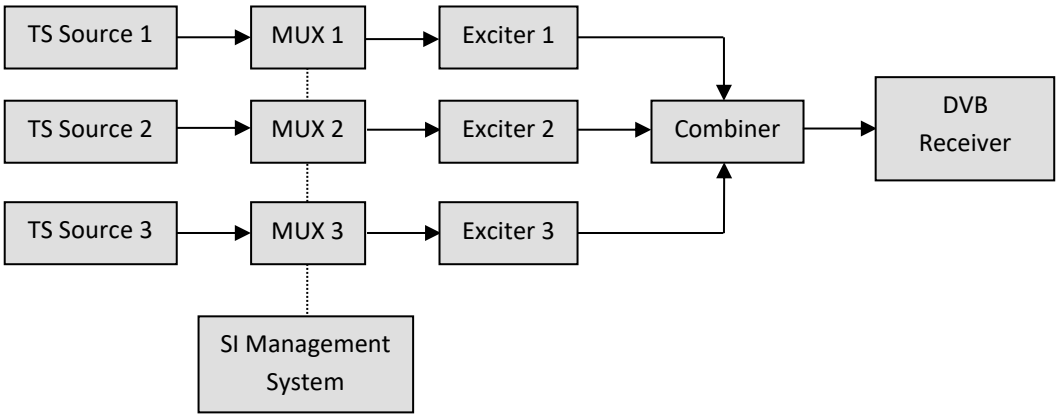
Test Case	**FiCom-5.2:3 Terrestrial: Multiple channel numbers per service**
Section	FiCom Unified, Chapter 5.2
Requirement	5.2.3-1, 5.2.3-3, 5.2.3-4, 5.2.3-5

Test Procedure

Purpose of test:

To verify IRD ability to receive multiple networks.
To verify IRD ability to support multiple LCN numbers for a service

Equipment:



Transmitter	Service 1	Service 2	Service 3		Frequency
MUX 1 TS_ID 1 N_ID 1 ON_ID [1)]	SID 1100 S_Name Test11 S_Type 0x19 PMT PID 1100 V PID 1109 A PID 1108 LCD 4, LCD 301	SID 1200 S_Name Test12 S_Type 0x19 PMT PID 1200 V PID 1209 A PID 1208 LCD 6, LCD 302	SID 1300 S_Name Test13 S_Type 0x1 PMT PID 1300 V PID 1309 A PID 1308 LCD 7, LCD 303		Can be chosen depending of the distribution media.
MUX 2 TS_ID 2 N_ID 2 ON_ID [1)]	SID 2100 S_Name Test21 S_Type 0x1 PMT PID 2100 V PID 2109 A PID 2108 LCD 1	SID 2200 S_Name Test22 S_Type 0x1 PMT PID 2200 V PID 2209 A PID 2208 LCD 3	SID 2300 S_Name Test23 S_Type 0x1 PMT PID 2300 V PID 2309 A PID 2308 LCD 9	SID 2400 S_Name Test24 S_Type 0x2 PMT PID 2400 A PID 2408 LCD 3	Can be chosen depending of the distribution media. Not same as Exciter 1 or Exciter 3.
MUX 3 TS_ID 3 N_ID 3 ON_ID [1)]	SID 3100 S_Name Test31 S_Type 0x19 PMT PID 3100 V PID 3109 A PID 3108 LCD 5, LCD 201	SID 3200 S_Name Test32 S_Type 0x19 PMT PID 3200 V PID 3209 A PID 3208 LCD 8, LCD 202	SID 3300 S_Name Test33 S_Type 0x1 PMT PID 3300 V PID 3309 A PID 3308 LCD 12, LCD 203	SID 3400 S_Name Test34 S_Type 0x2 PMT PID 3400 A PID 3408 LCD 2, LCD 204	Can be chosen depending of the distribution media. Not same as Exciter 1 or Exciter 2.

1) ON_id (Original_network_id) shall be 0x20F6 for Terrestrial and any in range 0x0001-0xfe00 (operational network) for Cable.

Test Procedure:

1. Perform factory reset and new channel search.
2. Observe the service list.
3. Zap through the services.
4. Fill in the measurement record

Measurement record:

Test Point	OK/NOK
IRD finds all services and adds them to the service list.	

Services are listed with their correct LCNv2 numbers.	
Services with multiple LCNv2 entries are listed multiple times according to the signalized channel numbers.	

Expected Result:
IRD correctly handles multiple LCNv2 service list entries per a service

TV list		OK / NOK
1 Test 21 3 Test 22 4 Test 11 5 Test 31 6 Test 12 7 Test 13 8 Test 32 9 Test 23 12 Test 33 201 Test 31 202 Test 32 203 Test 33 301 Test 11 302 Test 12 303 Test 13	2 Test 34 3 Test 24 204 Test 34	

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-5.2:4 Terrestrial: Simultaneous reception of multiple networks and NorDig LCD**
Section	FiCom Unified, Chapter 5.2.3, FiCom RoO, Chapter 5.1
Requirement	5.2.3-1, 5.2.3-2, 5.2.3-4
Test Procedure	**Purpose of test:** To verify the support for the reception of multiple networks and NorDig LCN. **Equipment:**

Transmitter	Service 1	Service 2	Service 3	Frequency
MUX 1 TS_ID 1 Network_ID 1 ON_ID 0x20F6	SID 1100 S_Name Test11 S_Type 0x19 PMT PID 1100 V PID 1109 A PID 1108 LCD 1	SID 1200 S_Name Test12 S_Type 0x16 PMT PID 1200 V PID 1209 A PID 1208 LCD 2	SID 1300 S_Name Test13 S_Type 0x0A PMT PID 1300 V PID 1309 A PID 1308 LCD 3	Can be chosen depending of the distribution media.
MUX 2 TS_ID 2	SID 2100 S_Name	SID 2200 S_Name	SID 2300 S_Name	Can be chosen depending of

	Network_ID 1 ON_ID either 0x22F1, 0x2242 or 0x20E9.	Test21 S_Type 0x19 PMT PID 2100 V PID 2109 A PID 2108 LCD 1	Test22 S_Type 0x16 PMT PID 2200 V PID 2209 A PID 2208 LCD 2	Test23 S_Type 0x0A PMT PID 2300 V PID 2309 A PID 2308 LCD 3	the distribution media.

Test Procedure:

1. Perform factory reset.
2. Perform new installation to the IRD with country selection 'Finland'
3. Observe the service list.
4. Fill in the measurement record.

Measurement record:

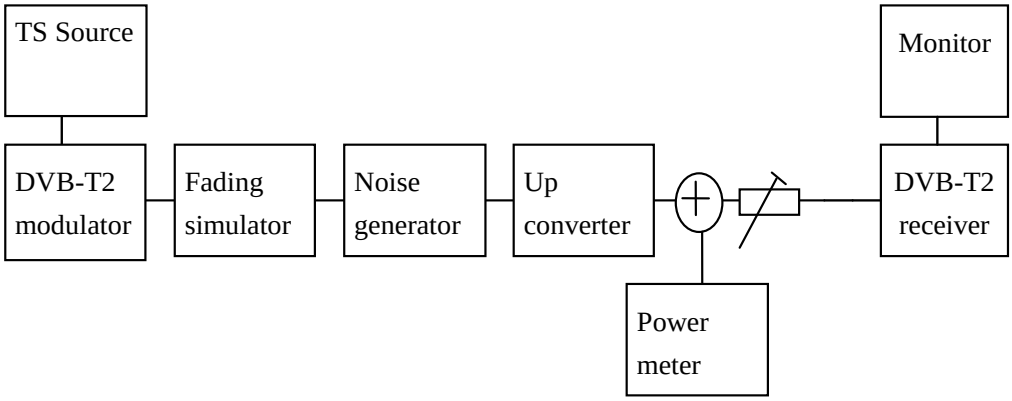
Test Point	**OK/NOK**
IRD builds the service list prioritizing the services having *original_network_id* of Digital Terrestrial Television in Finland.	
Foreign services are placed at the end of channel list using 'last in the list' principle.	
All services are available and selectable in the service list.	

Expected Result:

IRD correctly prioritizes *original_network_ID* of Finland when the user-preferred country selection is Finland.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-5.2:5 Terrestrial: DVB-T2 C/N performance on Gaussian channel**
Section	FiCom Unified, Chapter 4.1
Requirement	4.1-1, 5.2.4-0
Test Procedure	**Purpose of test:** To verify IRD RF performance in DVB-T2 conditions of Finland. To verify the IRD RF performance against NorDig Unified [3] requirements. To test the required C/N for quasi error free reception in Gaussian channel. **Equipment:**



Test equipment is equal with NorDig Test Plan 2.6.02.6.0
Task 3:57 DVB-T2: Performance: C/N Performance on Gaussian channel.

Test Procedure:

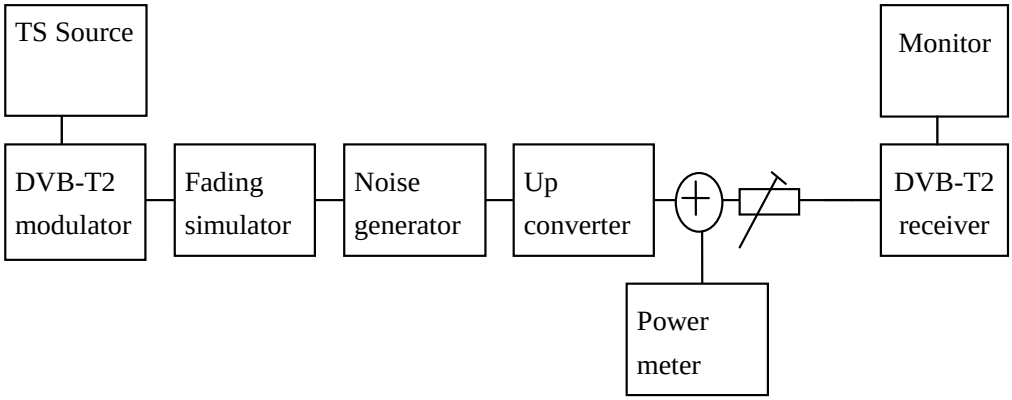
1. Set up the test instruments.
2. Use the following DVB-T2 modes
   VHF III:
   {7MHz 32k, 256QAM rotated, R4/5, GI19/256, PP4}
   UHF IV, V:
   {8MHz 32k extended, 256QAM rotated, R4/5, GI 19/128, PP2}
3. Set the up-converter to channel 21
4. Measure the input level to the attenuator.
5. Determine the attenuation of the attenuator and the cables.
6. Calculate the receiver input signal level and set it to –50dBm.
7. Use the value for the required C/N specified for the DVB-T2 mode in NorDig Unified Table 2.3.
8. Perform the channel search.
9. Increase the C/N from low value to higher value until the quality measurement procedure 2 (QMP2) fulfils.
10. Fill in the measured value in dB in the measurement record.
11. Repeat the test for the rest of the frequencies, signal bandwidths and DVB-T2 modes defined in the measurement record.

Measurement record:

Fill in the measurement record in Table 1.
Expected Result:
The required C/N for quasi error free reception in Gaussian channel is less than specified in NorDig Test Plan 2.6.0 Table 2.6.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			

Date		Sign	

Test Case	**FiCom-5.2:6 Terrestrial: DVB-T2 Minimum receiver signal input levels on Gaussian channel**
Section	FiCom Unified, Chapter 4.1
Requirement	4.1-1, 5.2.4-0
Test Procedure	**Purpose of test:** To verify IRD RF performance in DVB-T2 conditions of Finland. To verify the IRD RF performance against NorDig Unified [3] requirements. To test the required sensitivity for quasi error free reception in Gaussian channel. **Equipment:**  Test equipment is equal with NorDig Test Plan 2.6.02.6.0 Task 3:58 DVB-T2: Performance: C/N Performance on Gaussian channel. **Test Procedure:** 1. Set up the test instruments. 2. Use the following DVB-T2 modes: VHF III: {7MHz 32k, 256QAM rotated, R4/5, GI19/256, PP4} UHF IV, V: {8MHz 32k extended, 256QAM rotated, R4/5, GI 19/128, PP2} 3. Set the up-converter to channel 21 4. Measure the input level to the attenuator. 5. Determine the attenuation of the attenuator and the cables. 6. Calculate the receiver input signal level and set it to –50dBm. 7. Use the value for the required C/N specified for the DVB-T2 mode. in NorDig Unified Table 2.3. 8. Perform the channel search. 9. Attenuate the input signal level until the signal is no longer receivable. 10. Increase the input signal level from low value to higher value until the quality measurement procedure 2 (QMP2) fulfils. 11. Fill in the measured value in dB in the measurement record. 12. Repeat the test for the rest of the frequencies, signal bandwidths and DVB-T2 modes defined in the measurement record. **Measurement record:**

	Measurement record in Table 2. **Expected Result:** The required C/N for quasi error free reception in Gaussian channel is less than specified in NorDig Test Plan 2.6.0 Table 2.6.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date			Sign	

Test Case	**FiCom-5.2:7 Terrestrial: DVB-T2: Performance: Immunity to "LTE" – Adjacent channel sensitivity**
Section	FiCom Unified, Chapter 5.2.4
Requirement	5.2.4-1, 5.2.4-2
Test Procedure	**Purpose of test:** To verify IRD RF performance in DVB-T2 conditions of Finland. To verify the IRD RF performance against NorDig Unified [3] requirements. To verify the QEF reception for LTE signal interference on adjacent or other channels **Equipment:** See ETSI EN 303 340 V1.1.1 (2016-05) [9] **Test Procedure:** This task shall be performed according to ETSI EN 303 340 V1.1.1 Chapter 4.2.4. **Expected Result:** IRD correctly conforms to the requirements in ETSI EN 303 340 V1.1.1 [9].
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:
Date	Sign

Test Case	**FiCom-5.2:8 Terrestrial: DVB-T2: Performance: Immunity to "LTE" – Blocking**
Section	FiCom Unified, Chapter 5.2.4
Requirement	5.2.4-1, 5.2.4-2
Test Procedure	**Purpose of test:**

	To verify IRD RF performance in DVB-T2 conditions of Finland. To verify the IRD RF performance against NorDig Unified [3] requirements. To verify the QEF reception for LTE signal interference on adjacent or other channels **Equipment:** See ETSI EN 303 340 V1.1.1 (2016-05) [9] **Test Procedure:** This task shall be performed according to ETSI EN 303 340 V1.1.1 Chapter 4.2.5. **Expected Result:** IRD correctly conforms to the requirement in ETSI EN 303 340 V1.1.1 [9].			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-5.2:9 Terrestrial: DVB-T2: Performance: Immunity to "LTE" – Overloading**			
Section	FiCom Unified, Chapter 5.2.4			
Requirement	5.2.4-1, 5.2.4-2			
Test Procedure	**Purpose of test:** To verify IRD RF performance in DVB-T2 conditions of Finland. To verify the IRD RF performance against NorDig Unified [3] requirements. To verify the QEF reception for LTE signal interference on adjacent or other channels **Equipment:** See ETSI EN 303 340 V1.1.1 (2016-05) [9] **Test Procedure:** This task shall be performed according to ETSI EN 303 340 V1.1.1 Chapter 4.2.6. **Expected Result:** IRD correctly conforms to the requirement in ETSI EN 303 340 V1.1.1 [9].			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Common parameters for FiCom RF Test Tasks

RF Measurement record

FFT **Signal bandwidth**	**32k normal** **7 MHz**			**32k extended** **8 MHz**								
Center frequency [MHz]	177.5	198.5	226.5	474.0	522.0	570.0	618.0	666.0	714.0	762.0	810.0	858.0
DVB-T2 mode / Channel Id	K5	K8	K12	K21	K27	K33	K39	K45	K51	K57	K63	K69
256QAM R4/5 G19/256 PP4												
256QAM R4/5 G19/128 PP2												

Table 1 C/N performance on Gaussian channel

FFT **Signal bandwidth**	**32k normal** **7 MHz**			**32k extended** **8 MHz**								
Center frequency [MHz]	177.5	198.5	226.5	474.0	522.0	570.0	618.0	666.0	714.0	762.0	810.0	858.0
DVB-T2 mode / Channel Id	K5	K8	K12	K21	K27	K33	K39	K45	K51	K57	K63	K69
256QAM R4/5 G19/256 PP4												
256QAM R4/5 G19/128 PP2												

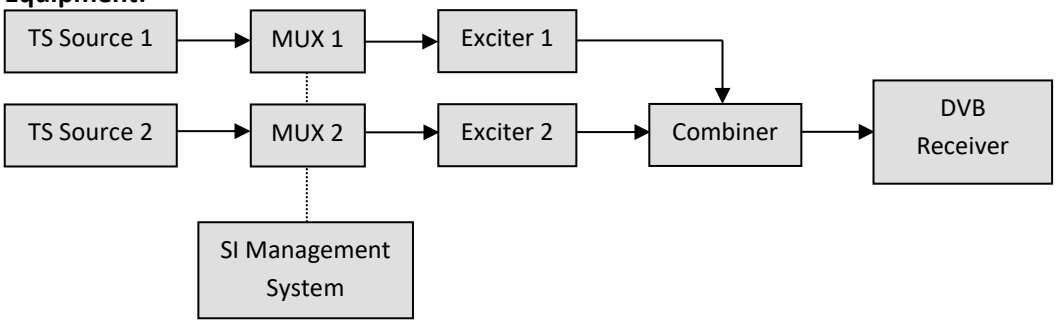
Table 2 Minimum level performance on Gaussian channel

Test Case	**FiCom-5.3:1 Cable: Automatic scan**
Section	FiCom Unified, Chapter 5.3.1
Requirement	5.3.1-1 – 5.3.1-8

Test Procedure

Purpose of test:
To verify that the automatic scan in cable networks.

Equipment:



Test streams or live signal may be used.

Stopwatch is required for the search duration evaluation.
This test may be performed in parallel with other test tasks.

If automatic scan procedure does not give detailed information on the progress, it may be difficult to verify the conformity to the applicable requirements. In that case manufacturer shall guarantee the Automatic Scan meets the Finnish Unified requirements.

Transmitter	Service 1	Service 2	Service 3	Frequency
MUX 1 TS_ID 1 Network_ID 1 ON_ID [1)]	SID 1100 S_Name Test11 PMT PID 1100 V PID 1109 A PID 1108 LCD 1	SID 1200 S_Name Test12 PMT PID 1200 V PID 1209 A PID 1208 LCD 2	SID 1300 S_Name Test13 PMT PID 1300 V PID 1309 A PID 1308 LCD 3	Can be chosen depending of the distribution media.
MUX 2 TS_ID 2 Network_ID 1 ON_ID [1)]	SID 2100 S_Name Test21 PMT PID 2100 V PID 2109 A PID 2108 LCD 4	SID 2200 S_Name Test22 PMT PID 2200 V PID 2209 A PID 2208 LCD 5	SID 2300 S_Name Test23 PMT PID 2300 V PID 2309 A PID 2308 LCD 6	Can be chosen depending of the distribution media.

1) ON_id (Original_network_id) shall be 0x20F6 for Terrestrial and any in range 0x0001-0xfe00 (operational network) for Cable.

Test Procedure:

1. Access the IRD navigator.
2. Start the stopwatch.
3. Initiate Cable automatic scan.
4. Wait until automatic scan is completed.
5. Stop the stopwatch.

6. Fill in the measurement record.

Measurement record:

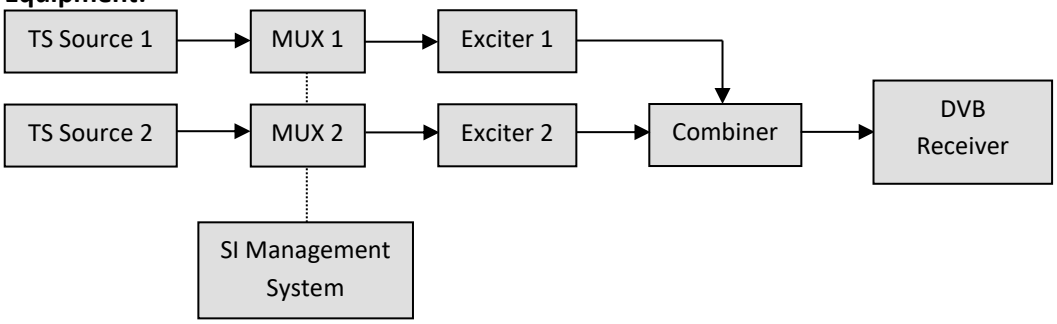
Test Point	OK/NOK
IRD has a menu item for automatic scan	
IRD searches through 114MHz to 858MHz using 8MHz raster, linearly, until finds a multiplex with *NIT_actual*.	
IRD reads the NIT_actual table of the first found multiplex and uses the signalized information for tuning the rest of the network.	
IRD does not scan the other remaining frequencies.	
Automatic scan procedure is completed within 15 minutes in typical conditions.	

Expected Result:
Automatic scan works as expected.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-5.3:2 Cable: Manual scan**
Section	FiCom Unified, Chapter 5.3.2
Requirement	5.3.2-1 – 5.3.2-5
Test Procedure	**Purpose of test:** To verify that the IRD manual scan behaves correctly.

Equipment:



Manually scanned multiplexes may be transmodulated from terrestrial or satellite broadcast.

Transmitter	Service 1	Service 2	Service 3	Frequency
MUX 1 TS_ID 1 Network_ID 1	SID 1100 S_Name Test11 PMT PID	SID 1200 S_Name Test12 PMT PID	SID 1300[2)] S_Name Test13 PMT PID	Can be chosen depending of the

ON_ID [1]	1100 V PID 1109 A PID 1108 LCD 1	1200 V PID 1209 A PID 1208 LCD 2	1300 V PID 1309 A PID 1308 LCD 3	distribution media.
MUX 2 TS_ID 2 Network_ID 1 ON_ID [1]	SID 2100 S_Name Test21 PMT PID 2100 V PID 2109 A PID 2108 LCD 4	SID 2200 S_Name Test22 PMT PID 2200 V PID 2209 A PID 2208 LCD 5	SID 2300 S_Name Test23 PMT PID 2300 V PID 2309 A PID 2308 LCD 6	Can be chosen depending of the distribution media.

1) ON_id (Original_network_id) shall be 0x20F6 for Terrestrial and any in range 0x0001-0xfe00 (operational network) for Cable.

2) Service SID 1300 shall be added to the network during the test

Test Procedure:

1. Perform factory reset.
2. Perform manual scan on MUX 1.
3. Update the PSI/SI information on the MUX 1, e.g. add a service to NIT.
4. Provoke the IRD to perform a quasi-static update procedure.
   (That is, perform the actions usually required to trigger an automatic channel list update.).
5. Verify the IRD does *not* perform an automatic channel list update.

6. Perform manual scan on MUX 2.
7. Observe the service list.

8. Perform manual scan again on MUX 1.
9. Observe the service list.

10. Update the PMT on the service SID 1100 (e.g. add or remove a component).
11. Observe the IRD behavior.

12. Fill in the measurement record.

Measurement record:

Test Point	**OK/NOK**
IRD has the manual scan functionality for installing individual cable multiplexes by their center frequency.	
Manual scan either auto-detects or requires the user to enter the symbol rate and QAM mode. No other additional parameters are required.	
IRD ignores the quasi-static SI updates, when the multiplexes are installed with the 'manual scan' method.	
IRD does not clear the service list in the 'manual scan'.	
IRD does not show duplicate services in the service list.	
IRD reacts to PMT updates on services installed with a manual scan	

Expected Result:

Service list:

Steps 1-5	**Steps 6-7**	**Steps 8-12**

LCN	Service name	LCN	Service name	LCN	Service name
1	Test11	1	Test11	1	Test11
2	Test12	2	Test12	2	Test12
		4	Test21	3	Test13
		5	Test22	4	Test21
		6	Test23	5	Test22
				6	Test23

Manual scan works as expected.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-6.0:1 Service Information and Program Specific Information - NorDig**
Section	FiCom Unified, Chapter 6
Requirement	6-1 – 6-3, 6-6 – 6-8
Test Procedure	**Purpose of test:** To verify IRD PSI/SI performance in conditions of Finland. To verify the IRD PSI/SI performance against NorDig Unified[3] requirements. **Equipment:** NorDig Test Plan 2.6.0 tasks 13:1 – 13:9, 14:1 – 14:13. **Test Procedure:** NorDig Test Plan 2.6.0 tasks 13:1 – 13:9, 14:1 – 14:13. **Measurement record:**

Test Point	**OK/NOK**
Task 13:5 SI: Text strings and field size of the SI descriptor	
Task 13:7 NIT_actual – Missing terrestrial_system_delivery_descriptor*	
Task 13:8 NIT_actual – Missing T2_delivery_system_descriptor*	
Task 13:16 Dynamic update of SDT_actual running status and linkage to a service replacement service	
Task 13:24 PMT Descriptors - General	
Task 13:26 Dynamic update of PMT PID values	
Task 13:27 Dynamic update of PMT-Component priority (stream type)	
Task 14:3 Service list – Service types and categories	
Task 14:5 Service list - Inconsistent of SDT_actual and NIT_actual information	
Task 14:7 Service list – NIT_actual original_network_ID	

Task 14:8 Service list – NIT_actual network_ID	
Task 14:11 Service list – Simultaneous transmission of LCD v1 and v2	
Task 14:13 Service list - Priority of LCN between SD and HDTV services	

*) Antenna Ready only

Expected Result:
IRD correctly conforms to the applicable PSI/SI performance requirements in NorDig Unified.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-6.1:1 Network evolution - NorDig**
Section	FiCom Unified, Chapter 6.1
Requirement	6.1-1 – 6.1-2
Test Procedure	**Purpose of test:** To verify IRD network evolution performance in conditions of Finland. To verify the IRD network evolution performance against NorDig Unified[3] requirements. **Equipment:** NorDig Test Plan 2.6.0 tasks 13:10, 13:11, 14:14 – 14:21. **Test Procedure:** NorDig Test Plan 2.6.0 tasks 13:10, 13:11, 14:14 – 14:21. **Measurement record:**

Test Point	**OK/NOK**
Task 13:10 Quasi static update of SDT_actual	
Task 13:11 Quasi-static update of SDT_actual – linkage to NorDig simulcast replacement service	
Task 14:14 Quasi-static update of service list – service addition	
Task 14:15 Quasi-static update of service list – non-visible data service addition	
Task 14:16 Quasi-static update of service list – services moved between different transport streams	
Task 14:17 Quasi-static update of service list – service remove	
Task 14:18 Quasi-static update of service list from NIT_actual for non-existing multiplexers	
Task 14:19 Quasi-static update of service list from NIT_actual for	

removing a multiplex	
Task 14:20 Quasi-static update of NorDig LCN v1	
Task 14:21 Quasi-static update of NorDig LCN v2	

Expected Result:
IRD correctly conforms to the applicable Network Evolution requirements in NorDig Unified.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

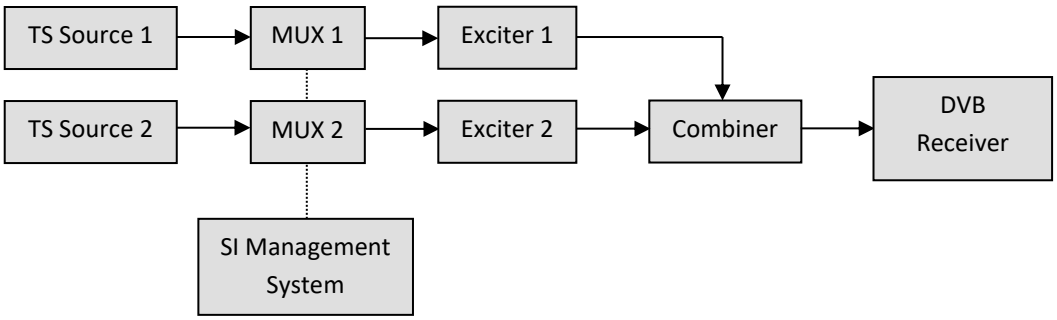
Test Case	**FiCom-6.1:2 Network evolution - User actions**
Section	FiCom Unified, Chapter 6.1
Requirement	6.1-3 – 6.1-8, 6.1-10
Test Procedure	**Purpose of test:** To verify the IRD behavior during network evolution. **Equipment:** This task shall be performed in parallel with Task FiCom-6.1:1 . **Test Procedure:** 1. Factory reset and perform a new channel search 2. Perform a SI update in the network (e.g. add a multiplex to the network). 3. Perform the actions required to trigger an automatic channel list update. 4. Observe the IRD behavior and service list. 5. Perform a SI update in the network 6. Perform the actions required to trigger an automatic channel list update. 7. Cancel an ongoing automatic channel list update procedure. 8. Set the IRD to stand-by mode and back to active mode. 9. Observe the IRD behavior and service list. 10. Perform a SI update in the network 11. Perform the actions required to trigger an automatic channel list update. 12. Forcibly cancel an ongoing automatic channel list update procedure. 13. Observe the IRD behavior and service list. 14. Cut the RF signal. 15. Perform the actions required to trigger an automatic channel list update. 16. Observe the IRD behavior and service list. 17. Fill in the measurement record.

Measurement record:

Test Point	OK/NOK
IRD asks the user for confirmation before or informs the user about changes in the service list after performing a channel list update.	
IRD does not re-request the update until visiting stand-by mode, if user rejects the service list update.	
IRD does not clear the service list if a channel list update procedure is forcibly aborted.	
IRD does not consider a loss of RF reception as a channel list update.	

Expected Result:
IRD correctly handles the network evolution.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-6.2:1 PSI/SI Forward compatibility and robustness**
Section	FiCom Unified, Chapter 6.2
Requirement	6.2-1, 6.2-2
Test Procedure	**Purpose of test:** To verify IRD ability to handle unknown or unexpected signalization. **Equipment:**  Test environment shall be a network of two multiplexes with several SD and HD television services. PSI/SI signalization shall include • unknown descriptors • descriptors with unknown values • descriptors with reserved values

- known descriptors in unexpected context
- known descriptors with undefined / unknown data fields
- known descriptors with unexpected values

Test Procedure:

1. Perform factory reset and new channel search.
2. Access and view the service list.
3. Zap through the services.
4. Access and view the EPG/ESG.
5. Fill in the measurement record.

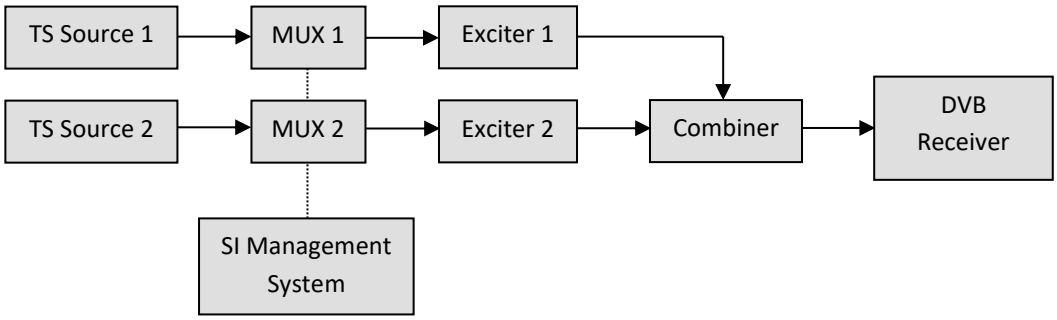
Measurement record:

Test Point	OK/NOK
IRD performance is not disturbed by the unknown / unexpected data in PSI/SI signalization	

Expected Result:
IRD correctly handles the unknown and unexpected data in PSI/SI signalization. Unknown and unexpected data do not cause harm to the receiver.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-6.2:2 HEVC service_type and service priorities**
Section	FiCom Unified 4.0, Chapter 6.2.1
Requirement	6.2.1-1 – 6.2.1-3, 6.2.1-5
Test Procedure	**Purpose of test:** To verify that IRD supporting HEVC is able to display the HEVC video correctly. To verify that IRD not supporting HEVC video is not disturbed by a HEVC service. **Equipment:**



Transmitter	Service 1	Service 2	Service 3	Frequency
MUX 1 TS_ID 1	SID1100 service_type:	SID1200 service_type:	SID1300 service_type:	Can be chosen depending of

Network_ID 1 ON_ID [1)]	0x20 S_Name: Test11 LCD: 1 visible 3840x2160p	0x19 S_Name: Test12 LCD: 2 visible 1280x720p50	0x01 S_Name: Test13 LCD: 3 visible 720x576i25	the distribution media.
MUX 2 TS_ID 2 Network_ID 2[2)] ON_ID [1)]	SID2100 service_type: 0x1F S_Name: Test21 LCD: 2 visible 1920x1080p50	SID2200 service_type: 0x16 S_Name: Test22 LCD: 1 visible 720x576i25	SID2300 service_type: 0x01 S_Name: Test23 LCD: 6 visible 720x576i25	Can be chosen depending of the distribution media.

1) ON_id (Original_network_id) shall be 0x20F6 for Terrestrial and any in range 0x0001-0xfe00 (operational network) for Cable.

2) Network_ID for DVB-C IRD tests shall be same in all muxes.

Test Procedure:

1. Perform factory reset and new channel search.
2. Observe the service lists.
3. Verify that the IRD is able to display the services correctly.
4. Fill in the measurement record.

Measurement record:

IRD supporting HEVC:Channel Position	**Service name**	**Service_type**	**OK/NOK**
1	Test11	0x20	
2	Test21	0x1F	
3	Test13	0x01	
6	Test23	0x01	
last in list	Test12	0x19	
last in list	Test22	0x16	

Test Point	**OK/NOK**
IRD is able to display the HEVC UHD HDR service correctly	
IRD is able to display the HEVC HD service correctly	
IRD prioritizes the service type 0x1F over other TV service types	

IRD not supporting HEVC:

Channel Position	**Service name**	**Service_type**	**OK/NOK**
1	Test12	0x19	
2	Test22	0x16	
3	Test13	0x01	
6	Test23	0x01	

Test Point	**OK/NOK**
Unsupported HEVC services do not cause any harm to the receiver	

Expected Result:

IRD supporting HEVC correctly displays the HEVC video content.

IRD not supporting HEVC is not disturbed by an unknown / unsupported *service_type* or *stream_type*.

Test Result(s)

Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date			Sign	

Test Case	**FiCom-6.2:3 HEVC services – NorDig**			
Section	FiCom Unified 4.0, Chapter 6.2.1			
Requirement	6.2.1-1 – 6.2.1-5			
Test Procedure	**Purpose of test:** This is a placeholder for NorDig HEVC service compliance tests. **Equipment:** Tbd. **Test Procedure:** Tbd.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date			Sign	

Test Case	**FiCom-6.3:1 EPG information - NorDig**
Section	FiCom Unified, Chapter 6.3
Requirement	6.3-1 – 6.3-3
Test Procedure	**Purpose of test:** To verify IRD EIT performance in conditions of Finland. To verify the IRD EIT performance against NorDig Unified [3] requirements. **Equipment:** NorDig Test Plan 2.6.0 tasks 13:17 – 13:23. **Test Procedure:**

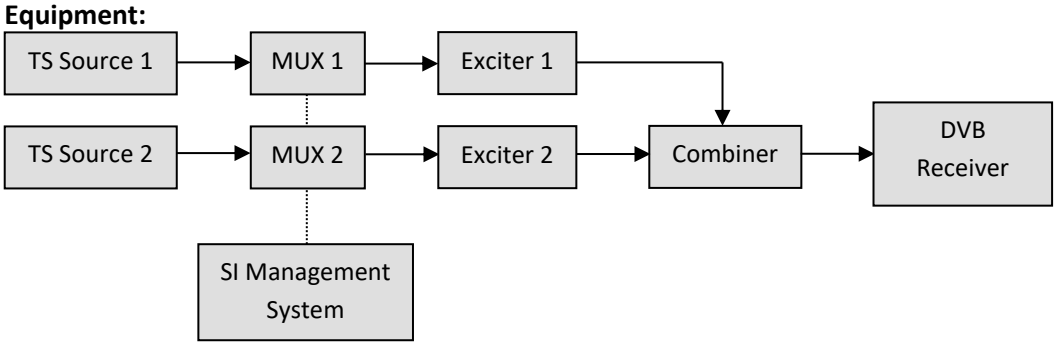
NorDig Test Plan 2.6.0 tasks 13:17 – 13:23.

Measurement record:

Test Point	OK/NOK
Task 13:17 Dynamic update of EIT actual/other p/f	
Task 13:19 Dynamic update of EIT actual/other p/f short_event_descriptor, extended_event_descriptor and content_descriptor	
Task 13:20 Dynamic update of EIT actual/other p/f content descriptor and component_descriptor	
Task 13:21 Dynamic update of EIT actual/other p/f parental_rating_descriptor	
Task 13:22 Dynamic update of EIT actual/other p/f and schedule in ESG using linkage	
Task 13:23 Dynamic update of EIT actual/other p/f and schedule in ESG	

Expected Result:
IRD correctly conforms to the applicable EIT performance requirements in NorDig Unified.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-6.3:2 EPG information in Finland**
Section	FiCom Unified, Chapter 6.3
Requirement	6.3-1 – 6.3-3
Test Procedure	**Purpose of test:** To verify IRD EIT performance in conditions of Finland. **Equipment:**  *For some domestic services, EIT_actual p/f is triggered dynamically by the broadcasted content. Consequently there may be mismatches between EIT_actual p/f and EIT_schedule.*

Test stream shall contain EIT_actual p/f and schedule with the following features:

- Events for which start_time and duration parameters are different in EIT_actual p/f and EIT_actual _schedule. Difference may be few seconds.
- Consecutive events A and B overlapping for few seconds: start_time(A) << start_time(B) and start_time(A) + duration(A) > start_time(B)
- EIT_actual where event_name, short_event_descriptor and extended_event_descriptor are signalized in multiple languages, in a random order.

Test Procedure:

1. Perform factory reset and new channel search.
2. Observe the EIT information in the Navigator.
3. Observe the EIT information in the EPG/ESG.
4. Verify that the IRD is able to display the EIT data correctly.
5. Fill in the measurement record.

Measurement record:

Test Point	**OK/NOK**
Information acquired from EIT p/f is prioritized over EIT_schedule.	
EIT p/f and schedule mismatch does not cause harm to the receiver.	
Overlapping EIT event information does not cause any harm to the receiver.	
Multi-lingual EIT data is displayed correctly regardless of the order of the languages	

Expected Result:
IRD correctly conforms to the applicable EIT performance requirements.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-6.4:1 System time**
Section	FiCom Unified, Chapter 6.4
Requirement	6.4-1 – 6.4-3
Test Procedure	**Purpose of test:** To verify IRD EIT performance in conditions of Finland. To verify the IRD EIT performance against NorDig Unified [3] requirements. **Equipment:** Ref: NorDig Test Plan 2.6.0 task 13:29. **Test Procedure:**

1. Perform NorDig Test Plan 2.6.0 task 13:29 using Finnish locale.
2. Observe the system time in the Navigator.
3. Observe the time and date notation in the Navigator.
4. Fill in the measurement record.

Measurement record:

Test Point	**OK/NOK**
Task 13:29 Dynamic update of TDT/TOT	
Time in the user interface is displayed as the local time with daylight saving.	
Time in the user interface is displayed as 24h, 'hh:mm'.	
Date in the user interface is displayed as 'day.month.year'.	

Expected Result:
IRD correctly conforms to the applicable EIT performance requirements in NorDig Unified.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-7.1:1 Signal level meter and Network information display**
Section	FiCom Unified, Chapter 7
Requirement	7-1 – 7-3
Test Procedure	**Purpose of test:** To verify IRD is able to display signal information and the required transmission parameters. *IRD must not expect the user to know the transmission parameters beforehand for tuning or acquiring the signal information.* *If IRD requires tuning parameters other than the center frequency for manual scan of a transmitter, those parameters shall be available for the user.* **Equipment:** Live signal or test streams. NIT_actual of the first network shall contain *network_name_descriptor*. NIT_actual of the second network shall contain *multilingual_network_name_descriptor* with Finnish, Swedish and English languages. **Test Procedure:**

1. Perform factory reset and new channel search.
2. Access the Navigator.
3. Observe the SSI and SQI indicators.
4. Observe the Transmission parameters.
5. Observe the Network name indication.
6. Fill in the measurement record.

Measurement record:

Test Point	**OK/NOK**
IRD displays SSI and SQI for the currently selected center frequency. User does not have to know the frequency beforehand.	
IRD displays the transmission parameters required by the IRD for tuning the selected multiplex manually.	
IRD displays *network_name_descriptor* content.	
IRD displays *multilingual_network_name_descriptor* content prioritizing the user-preferred UI language.	

Expected Result:
IRD correctly displays the signal level and network information.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-8.0:1 System Software Update: General**
Section	FiCom Unified, Chapter 8
Requirement	8-1 – 8.3
Test Procedure	**Purpose of test:** To verify IRD is able to perform a system software update. **Equipment:** IRD manufacturer shall specify the equipment for this test. **Test Procedure:** IRD manufacturer shall specify the procedure for this test. **Measurement record:**

Test Point	**OK/NOK**
IRD has a mechanism for system software update:	
DVB-SSU (OK, NOK or N/A)	
SSU over the internet (OK, NOK or N/A)	
USB SSU. Software is freely downloadable (OK, NOK, N/A)	
IRD detects system software update automatically	

Expected Result:

	IRD has a mechanism for updating its system software. IRD manufacturer has provided a description of the SSU concept.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-8.0:2 System Software Update: DVB-SSU / NorDig - Terrestrial**
Section	FiCom Unified, Chapter 8, FiCom RoO, Chapter 7
Requirement	8-2, 8-4
Test Procedure	**Purpose of test:** To verify IRD is able to perform a DVB system software update. DVB-SSU Simple Profile is the recommended update method for receivers. This test task is optional, if other SSU methods conforming to FiCom Unified req. 8-2 are supported. **Equipment:** NorDig Unified Test Plan v2.6.0 Tasks 11:1, 11:3 and 11:4 DSMCC data carousel speed shall be set to 64kbit/s. Live signal shall be used as basis of the test. Signalization as per terrestrial operators' requirements. **Test Procedure:** IRD manufacturer shall specify the procedure for this test. **Measurement record:**

Test Point	**OK/NOK**
Task 11:1 IRD System software update using DVB SSU simple profile	
Task 11:3 IRD System software update using DVB SSU Notifications update type 0x4	
Task 11:4 SSU end user functionality	
IRD supports low-bitrate DSMCC download	

Expected Result:
IRD's DVB SSU mechanism is verified in live cable conditions.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			

Date		Sign	

Test Case	**FiCom-8.0:3 System Software Update: DVB-SSU / NorDig - Cable**
Section	FiCom Unified, Chapter 8, FiCom RoO, Chapter 7
Requirement	8-2, 8-4
Test Procedure	**Purpose of test:** To verify IRD is able to perform a DVB system software update. DVB-SSU Simple Profile is the recommended update method for receivers. This test task is optional, if other SSU methods conforming to FiCom Unified req. 8-2 are supported. **Equipment:** NorDig Unified Test Plan v2.6.0 Tasks 11:1, 11:3 and 11:4 DSMCC data carousel speed shall be set to 100kbit/s. Live signal shall be used as basis of the test. Signalization as per cable operators' requirements. **Test Procedure:** NorDig Unified Test Plan v2.6.0 Tasks 11:1, 11:3 and 11:4 **Measurement record:**

Test Point	**OK/NOK**
Task 11:1 IRD System software update using DVB SSU simple profile	
Task 11:3 IRD System software update using DVB SSU Notifications update type 0x4	
Task 11:4 SSU end user functionality	
IRD supports low-bitrate DSMCC download	

Expected Result:
IRD's DVB SSU mechanism is verified in live cable conditions.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-8.0:4 System Software Update: PVR recordings**
Section	FiCom Unified, Chapter 8

Requirement	8-5
Test Procedure	**Purpose of test:** To verify fully automatic or semi-automatic system software update does not disturb active and scheduled recordings. *SSU initiated or approved by the user is out of the scope of this test.* **Equipment:** IRD manufacturer shall specify the equipment for this test. **Test Procedure:** IRD manufacturer shall specify the procedure for this test. IRD manufacturer shall guarantee the SSU download does not cause harm to the recordings. **Measurement record:** **Test Point** / **OK/NOK** Manufacturer guarantees the IRD prioritizes an active recording over fully automatic or semi-automatic SSU Manufacturer guarantees the IRD prioritizes scheduled recordings over fully automatic or semi-automatic SSU **Expected Result:** Manufacturer guarantees the fully automatic or semi-automatic SSU does not disturb active or planned recordings IRD manufacturer has provided a description of the SSU concept.
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:
Date	Sign

Test Case	**FiCom-8.0:5 System Software Update: CI+ Module: NorDig - Terrestrial**
Section	FiCom Unified, Chapter 8
Requirement	8-7
Test Procedure	**Purpose of test:** To verify IRD with CI+ supports DVB-SSU of a CI+CAM in terrestrial network. **Equipment:** NorDig Unified Test Plan v2.6.0 Task 11:5 Live signal shall be used as basis of the test.

	Signalization as per terrestrial operators' requirements. This test is applicable for IRDs equipped with CI+. **Test Procedure:** NorDig Unified Test Plan v2.6.0 Task 11:4 **Measurement record:** **Test Point** | **OK/NOK** Task 11:5 Common interface plus (CI+) CAM module system software update | **Expected Result:** IRD with CI+ supports DVB-SSU of a CI+CAM in terrestrial network.
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:
Date	Sign

Test Case	**FiCom-8.0:6 System Software Update: CI+ Module: NorDig - Cable**
Section	FiCom Unified, Chapter 8
Requirement	8-7
Test Procedure	**Purpose of test:** To verify IRD with CI+ supports DVB-SSU of a CI+CAM in cable network. **Equipment:** NorDig Unified Test Plan v2.6.0 Task 11:5 Live signal shall be used as basis of the test. Signalization as per cable operators' requirements. This test is applicable for IRDs equipped with CI+. **Test Procedure:** NorDig Unified Test Plan v2.6.0 Task 11:5. **Measurement record:** **Test Point** | **OK/NOK** NorDig Unified Test Plan v2.6.0 Tasks 11:5 | **Expected Result:** IRD with CI+ supports DVB-SSU of a CI+CAM in cable network.
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO

	Describe more specific faults and/or other information:		
Date		Sign	

FiCom-9. Teletext and Subtitling

Test Case	**FiCom-9.0:1 Teletext and Subtitling: NorDig**
Section	FiCom Unified, Chapter 9
Requirement	9-1, 9-4, 9-5, 9-6
Test Procedure	**Purpose of test:** To verify IRD supports teletext and DVB subtitling according to NorDig requirements. **Equipment:** NorDig Unified Test Plan v2.6.0 Task 8:2, 8:3, 8:5, 8:7 – 8:12, 8:14 **Test Procedure:** NorDig Unified Test Plan v2.6.0 Task 8:2, 8:3, 8:7 – 8:12, 8:14 **Measurement record:**

Test Point	**OK/NOK**
Task 8:2 Subtitling - Only display subtitling if match language in user preferences	
Task 8:3 Subtitling - Temporary changes to subtitling settings	
Task 8:5 Subtitling – DVB Subtitling and subtitling priority (DVB/EBU)	
Task 8:8 Teletext – EBU Teletext level 1.5	
Task 8:9 Teletext - decoding method(VBI)	
Task 8:10 Teletext decoding method(OSD)	
Task 8:11 Teletext – teletext pages	
Task 8:12 Teletext – teletext pages - cache	
Task 8:14 Subtitling – DVB Subtitling	

Expected Result:
IRD correctly supports teletext and subtitling.

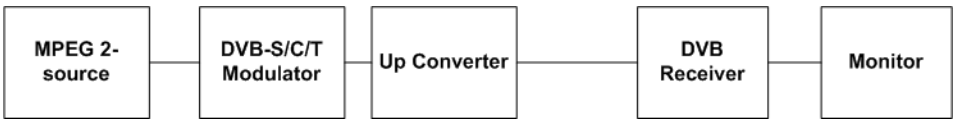
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-9.0:2 Teletext and Subtitling: Hard of Hearing**
Section	FiCom Unified, Chapter 9

Requirement	9-2, 9-3
Test Procedure	

Purpose of test:
To verify that the IRD supports Hard of Hearing subtitling in Finnish networks

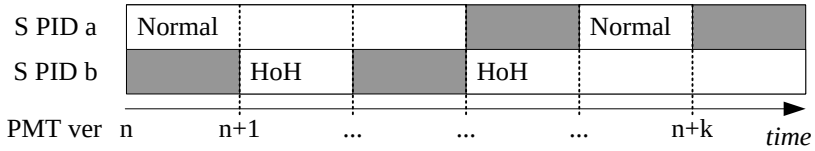
Equipment:



Transport stream containing test services with DVB subtitling and DVB subtitling for the hard of hearing components.

For MPEG-2 content, Hard of Hearing shall be signalized in PMT iso_639_language_descriptor as 'dut' (Dutch).

For MPEG-4 content, Hard of Hearing shall be signalized in PMT iso_639_language_descriptor as 'fin' (Finnish) or 'swe' (Swedish), depending on the subtitling content.



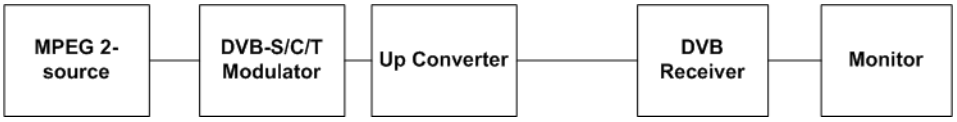
Test Procedure:

1. Update the PMT table of the service and add/remove normal and hard-of-hearing subtitling component(s) matching the user preference for subtitling language.
2. Observe the subtitling.
3. Enable 'hard-of-hearing' subtitling in the user preferences.
4. Observe the subtitling.
5. Update the PMT table of the service and add/remove normal and hard-of-hearing subtitling component(s) not matching the user preference for subtitling language.
6. Observe the subtitling.
7. Fill in the measurement record.

Measurement record:

Test Point	**OK/NOK**
IRD displays subtitling only if matching with the primary/secondary language.	
IRD displays Hard-of-hearing subtitling only if HoH is enabled at the user preference.	
IRD indicates which ones of the available subtitling tracks are of HoH type	
If Hard-of-Hearing is enabled, IRD prioritizes the subtitling tracks as follows: 1. Primary user preference language, Hard-of-hearing	

	2. Primary user preference language, Normal 3. Secondary user preference language, Hard-of-hearing 4. Secondary user preference language, Normal			
	Expected Result: IRD supports Hard-of-Hearing subtitling. IRD indicates the Hard-of-Hearing subtitles.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-9.1:1 Teletext subtitling and pages, with and without PTS transmission**
Section	FiCom Unified, Chapter 9.1
Requirement	9.1-1, 9.1-2, NorDig Unified 7.1, 7.2
Test Procedure	**Purpose of test:** To verify IRD supports teletext pages and subtitling according to NorDig requirements. To verify IRD supports teletext pages and subtitling with and without PTS. **Equipment:**  Stream shall contain services with the following features: • Service with teletext pages and subtitling with PTS signalized in the PES header of teletext transmission. • Service with teletext pages and subtitling without PTS signalized Teletext streams shall be encoded with Latin G2 supplementary character set. Teletext streams shall contain multiple subtitle languages. ***This test includes the requirements in the NorDig Unified Test Plan v2.6.0 Task 8:13.*** **Test Procedure:** 1. Perform factory reset and new channel search. 2. Access the Navigator. 3. Verify there are user preferences for primary and secondary subtitling language. 4. Select a service with multiple subtitle languages and PTS signalized in the teletext PES header. 5. Select Finnish or Swedish as the primary language.

6. Observe the subtitling sync for a longer period of time, e.g. 45 minutes
7. Observe the Scandinavian characters in both teletext subtitling and pages
8. Select a language not broadcasted as the primary language.
9. Select Swedish or Finnish as the secondary language.
10. Observe briefly the subtitling sync and Scandinavian characters.
11. Repeat the test on a service without PTS in the teletext PES header.
12. Fill in the measurement record

Measurement record:

Test Point	OK/NOK
IRD has user preference for both primary and secondary subtitling language	
Teletext subtitling is displayed in sync with the video on a service without PTS in teletext PES header	
Teletext subtitling is displayed in sync with the video on a service with PTS in teletext PES header	
Nordic characters are displayed correctly in TTX subtitling	
Nordig characters are displayed correctly on TTX pages	

Expected Result:
IRD correctly supports teletext and subtitling.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

FiCom-10. User interface

Test Case	**FiCom-10.0:1 User interface - NorDig**
Section	FiCom Unified, Chapter 10
Requirement	10-1, 10-2
Test Procedure	**Purpose of test:** To verify IRD user interface and preferences complying with NorDig Unified Specification **Equipment:** See NorDig Unified Test Plan v2.5.0 tasks 17:1 - 17:3 **Test Procedure:** See NorDig Unified Test Plan v2.5.0 tasks 17:1 - 17:3 **Measurement record:**

Test Point	OK/NOK
Task 17:1 Stored preferences	

Task 17:2 Deletion of service lists	
Task 17:3 Reset to factory mode	

Expected Result:
IRD user interface and preferences comply with the requirements in NorDig Unified Specification.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-10.0:2 User interface**
Section	FiCom Unified, Chapter 10
Requirement	10-1, 10-2
Test Procedure	**Purpose of test:** To verify IRD user interface features **Equipment:** This test can be performed in parallel with task *FiCom-5.1:1 IRD installation.* **Test Procedure:** 1. Select Finnish as the user interface language 2. Browse the Navigator user interface 3. Select Swedish as the user interface language 4. Browse the Navigator user interface 5. Select English as the user interface language 6. Browse the Navigator user interface 7. Look for the software and hardware version information. 8. Fill in the measurement record **Measurement record:**

Test Point	**OK/NOK**
User interface is available in Finnish	
User interface is available in Swedish	
User interface is available in English	
IRD system software version is available for the user	
IRD hardware version information is available for the user *(hardware version may be IRD model name, version or a code used for identifying the IRD e.g. for customer support)*	

Expected Result:
IRD supports the required languages.
User interface contains information on SW and HW versions.

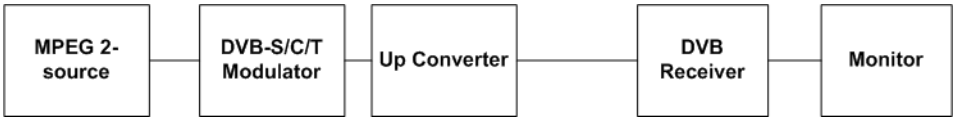
Test Result(s)	

Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date			Sign	

FiCom-11. Performance

Test Case	**FiCom-11.1:1 Zapping performance**
Section	FiCom Unified, Chapter 11
Requirement	11-1, 11-2, NorDig Unified 11.4
Test Procedure	**Purpose of test:** To verify IRD zapping performance in live conditions. **Equipment:** Live network or a test bed of streams with scrambled and free services. IRD under test. IRDs with CI+ slot: CI+CAM module and Smart card with a subscription. IRDs with integrated CA system: Smart card with a subscription. Stopwatch for timing the IRD performance. **Test Procedure:** 1. Perform a limited number of consecutive channel changes. 2. Fill in the measurement record. **Measurement record:** **Test Point** / **OK/NOK** IRD with integrated CA system: Average zapping time is < 4s IRD with CI+ slot: Average zapping time is < 6s **Expected Result:** IRD zapping performance meets the requirements.
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:
Date	Sign

FiCom-12. Power management

Test Case	**FiCom-12.1:1 Power management**
Section	FiCom Unified, Chapter 12
Requirement	12-1, 12-2
Test Procedure	**Purpose of test:** To verify IRD power management. **Equipment:**  Live network. IRD under test. All IRD A/V outputs shall be connected. **Test Procedure:** 1. View a service. 2. Set the IRD to stand-by mode. If IRD has a “stand-by scan” procedure, wait until it has completed. 3. Cut the IRD power from mains. 4. Wait for some time (e.g. 2 minutes). 5. Re-connect IRD power. 6. Observe the IRD behavior. 7. Fill in the measurement record. **Measurement record:** **Test Point** | **OK/NOK** If IRD power is cut in stand-by mode, it returns to the stand-by mode after a power cut. | IRD does not activate video outputs during stand-by mode. | **Expected Result:** IRD power management works as per requirements.
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:
Date	Sign

FiCom-13. IRD accessories and packaging

Test Case	**FiCom-13.1:1 IRD accessories and packaging**
Section	FiCom Unified, Chapter 13

Requirement	13.1, 13.2			
Test Procedure	**Purpose of test:** To verify IRD accessories and package **Equipment:** IRD under test. **Test Procedure:** Manufacturer shall guarantee the accessories and packaging of the retail IRD are as per requirements. **Measurement record:** **Expected Result:** IRD accessories and packaging are as per requirements.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date			Sign	

FiCom-14. PVR

Test Case	**FiCom-14.1:1 PVR: NorDig**
Section	FiCom Unified, Chapter 14
Requirement	14-0, 14.1-1, 14.2-2,- 14.2-4, 14.3-2 - 14.3-5, 14.4-1, 14.4-2, 14.4-4, 14.4-5
Test Procedure	**Purpose of test:** To verify IRD PVR complying with NorDig Unified Specification, with the additions, clarifications and exceptions in FiCom Unified [1] Chapter 14 and PVR resources and limitations described in Annex D. Task 15:8 is optional for IRD without integrated PVR storage mass media. Task 15:19 and 15:22 are optional for IDTVs without integrated PVR storage mass media. **Equipment:** See NorDig Unified Test Plan v2.5.0 tasks 15:2 - 15:11, 15:19-15:36, 15:38-15:56 **Test Procedure:** See NorDig Unified Test Plan v2.5.0 tasks 15:2 - 15:11, 15:19-15:36, 15:38-15:56 **Measurement record:**

Test Point	**OK / NOK / N/A**
Task 15:2 Recording capacity	
Task 15:3 Deletion of the recordings	
Task 15:4 Failed and incomplete recordings	
Task 15:5 File system intact after update	
Task 15:6 Limitations in recorded content – no extraction	
Task 15:7 Limitations in recorded content – downscaling of the HD content to the removable media	
Task 15:8 Disk Management	
Task 15:9 General PVR recording – bitrates	
Task 15:10 General PVR recording – service types	
Task 15:11 ESG/EPG recording programming – individual events without CRID	
Task 15:19 Accurate Recording – EIT information present	
Task 15:20 Accurate Recording – EIT information missing	
Task 15:21 Accurate Recording – Loss of signal	
Task 15:22 Accurate Recording – EIT update in stand-by	
Task 15:23 Simultaneous recording – OTR and viewing	
Task 15:24 Simultaneous recording – Scheduled recording and viewing	
Task 15:25 Simultaneous recording – OTR and time-shift	
Task 15:26 Simultaneous recording – Scheduled recording and time-shift	
Task 15:27 Simultaneous recording and playback	
Task 15:28 Back-to-back recordings – Static EIT information	
Task 15:29 Back-to-back recordings – Changes in EIT information	
Task 15:30 Timeshift recording	
Task 15:31 Manual recording	
Task 15:32 Manual recording – Changes in TDT/TOT	

Task 15:33 One Touch Recording (OTR)	
Task 15:34 Automatic Conflict Handling – During programming	
Task 15:35 Automatic Conflict Handling – After programming	
Task 15:36 Maximum length of recordings	
Task 15:38 Playback - General	
Task 15:39 Replay/Playback – trick modes in playback	
Task 15:40 Replay/Playback – trick modes in timeshift	
Task 15:41 Relative synchronisation	
Task 15:42 Full service playback – Dynamic update of PMT audio language	
Task 15:43 Full service playback – Dynamic update of PMT audio format	
Task 15:44 Full service playback – Dynamic update of PMT audio type	
Task 15:45 Full service playback – Dynamic update of PMT subtitling language	
Task 15:46 Full service playback – Subtitling for the hard-of-hearing	
Task 15:47 Full service playback – Dynamic update of PMT subtitling type	
Task 15:48 Full service playback – Subtitling syncrhonization	
Task 15:49 Full service playback – Subtitling synchronization in time-shift	
Task 15:50 Full service playback – Dynamic update of PMT video and audio PIDs	
Task 15:51 Full service playback – Dynamic update of video aspect ratio	
Task 1552 Full service playback – Dynamic update of PMT CA status	
Task 15:53 Dynamic changes in video stream in playback	
Task 15:54 Parental lock during playback	
Task 15:55 Maintaining scheduled recordings after network update	
Task 15:56 User actions disturbing the recording	

Expected Result:
Applicable PVR functionality complies with the requirements in NorDig Unified Specification.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-14.2:1 Content protection according to the security requirements**
Section	FiCom Unified 4.0, Chapter 14.2

Requirement	14.2-4			
Test Procedure	**Purpose of test:** To verify the PVR IRD content protection. **Equipment:** Manufacturer shall describe the procedure for this test. **Test Procedure:** Manufacturer shall describe the procedure for this test. **Expected Result:** PVR IRD supports content protection according to the NorDig Unified and FiCom security requirements.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-14.2:2 PVR: Free and Scrambled content, IRD with integrated CAS**
Section	FiCom Unified 4.0, Chapter 14.2
Requirement	14.2-1, 14.2-2, 14.2.1-1
Test Procedure	**Purpose of test:** To verify the IRD capability to handle scrambled services **Equipment:** Live signal IRD under test Smart cards with and without subscription. To verify IRD capability to handle recordings according to available descrambling resources. **Test Procedure:** 1. Remove smartcard from the IRD smartcard slot. 2. Tune to a free service. 3. Initiate a recording. 4. Observe IRD behavior. 5. Stop the recording. 6. Tune to a scrambled service. 7. Try to initiate a recording. 8. Observe IRD behavior.

9. Insert a smartcard with a subscription to the service.
10. Try to initiate a recording.
11. Observe IRD behavior.

12. Tune to a scrambled service without a subscription.
13. Try to initiate a recording.

14. Play back the recordings.
15. Fill in the measurement record.

Measurement record:

Test Point	**OK/NOK**
IRD records free content without a smartcard	
IRD does not record scrambled content without a smartcard having a subscription	
IRD records scrambled content with a smartcard having a subscription	
IRD does not record scrambled content with a smartcard without a subscription	

Expected Result:
PVR IRD correctly handles scrambled content.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-14.2:3 PVR: Free and Scrambled content, IRD with CI+ slot**
Section	FiCom Unified 4.0, Chapter 14.2
Requirement	14.2-1, 14.2-2, 14.2.2-1
Test Procedure	**Purpose of test:** To verify IRD capability to handle recordings according to available descrambling resources. **Equipment:** Live signal. IRD under test. CI+CAMs and smart cards with and without subscription. **Test Procedure:**

1. Remove the CI+CAM.
2. Tune to a free service.
3. Initiate a recording.
4. Observe IRD behavior.
5. Stop the recording.

6. Tune to a scrambled service.
7. Try to initiate a recording.
8. Observe IRD behavior.

9. Insert a CI+CAM with a smartcard having a subscription to the service.
10. Try to initiate a recording.
11. Observe IRD behavior.

12. Tune to a scrambled service without a subscription.
13. Try to initiate a recording.

14. Play back the recordings.
15. Fill in the measurement record.

Measurement record:

Test Point	**OK/NOK**
IRD records free content without a CAM and a smartcard	
IRD does not record scrambled content without a CAM and smartcard with subscription	
IRD records scrambled content with a CAM and a smartcard with subscription	
IRD does not record scrambled content with a CAM and a smartcard without a subscription	

Expected Result:
PVR IRD correctly handles scrambled content.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-14.2:4 PVR: Number of components, IRD with integrated CAS**
Section	FiCom Unified 4.0, Chapter 14.2
Requirement	14.2-3, 14.2-5
Test Procedure	**Purpose of test:** To verify IRD capability to handle recordings according to available descrambling resources. To verify IRD is able to prioritize the components according to the user

preferences, component format, type and language priority rules given in [1].

Equipment:
IRD under test.
Smartcard with a subscription.
Test stream with a service having multiple scrambled components.

Test Procedure:
1. Initiate a recording.
2. Observe IRD behavior.
3. Stop the recording.
4. Play back the recording.
5. Select the scrambled components one by one.
6. Fill in the measurement record.

Measurement record:

Test Point	OK/NOK
IRD records all elementary stream components.	

Expected Result:
PVR IRD correctly handles scrambled content.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-14.2:5 PVR: Number of components, IRD with CI+ slot**
Section	FiCom Unified 4.0, Chapter 14.2
Requirement	14.2-5
Test Procedure	**Purpose of test:** To verify IRD capability to handle recordings according to available descrambling resources. To verify IRD is able to prioritize the components according to the user preferences, component format, type and language priority rules given in [1]. **Equipment:** IRD under test. CAM with a limitation in number of simultaneous components. Smartcard with subscription Test stream with a service having more scrambled components than the CAM is able to decrypt simultaneously. *Example:* *Service has 1 video and 12 audio components.*

CI+CAM is limited to decrypt 10 elementary streams on a television service.
IRD is expected to record 9 out of 12 audio tracks with the particular CI+CAM.
IRD shall prioritize the audio component having the primary audio language, if available.

Test Procedure:

1. Initiate a recording.
2. Observe IRD behavior.
3. Stop the recording.
4. Play back the recording.
5. Fill in the measurement record.

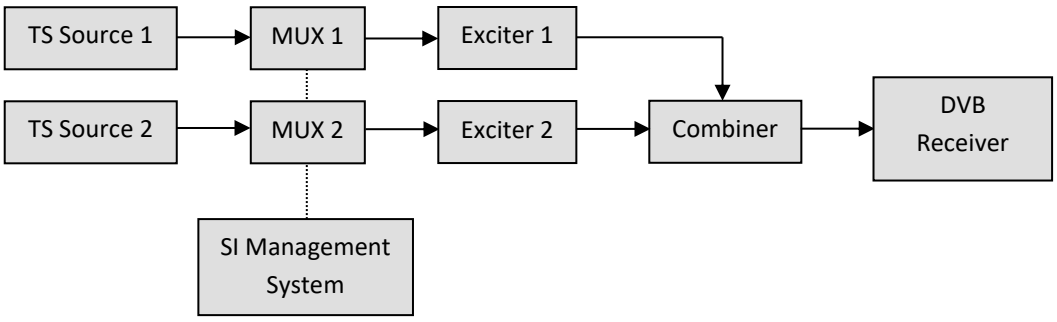
Measurement record:

Test Point	OK/NOK
IRD records all elementary stream components decryptable by the CAM.	
IRD is able to prioritize user-preferred components in the recording.	

Expected Result:
PVR IRD correctly handles scrambled content.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-14.2:6 PVR: Recording a service with HEVC video**
Section	FiCom Unified 4.0, Chapter 6.2.1
Requirement	6.2.1-1 – 6.2.1-3, 14.2-3
Test Procedure	**Purpose of test:** To verify that PVR IRD supporting HEVC is able to record and playback the HEVC video correctly. ***This test is applicable for PVR IRDs supporting HEVC*** **Equipment:**



Transmitter	Service 1	Service 2	Service 3	Frequency
MUX 1 TS_ID 1 Network_ID 1 ON_ID [1)]	SID1100 service_type: 0x1F S_Name: Test11 LCD: 1 visible 3840x2160p	SID1200 service_type: 0x19 S_Name: Test12 LCD: 2 visible 1280x720p50	SID1300 service_type: 0x01 S_Name: Test13 LCD: 3 visible 720x576i25	Can be chosen depending of the distribution media.
MUX 2 TS_ID 2 Network_ID 2[2)] ON_ID [1)]	SID2100 service_type: 0x1F S_Name: Test21 LCD: 2 visible 1920x1080p50	SID2200 service_type: 0x16 S_Name: Test22 LCD: 1 visible 720x576i25	SID2300 service_type: 0x01 S_Name: Test23 LCD: 6 visible 720x576i25	Can be chosen depending of the distribution media.

1) ON_id (Original_network_id) shall be 0x20F6 for Terrestrial and any in range 0x0001-0xfe00 (operational network) for Cable.

2) Network_ID for DVB-C IRD tests shall be same in all muxes.

Test Procedure:

1. Perform factory reset and new channel search.
2. Start recording a service with HEVC video
3. Stop recording.
4. Play back the video.
5. Fill in the measurement record.

Measurement record:

Test Point	OK/NOK
IRD is able to play back the HEVC UHD recording correctly	
IRD is able to play back the HEVC HD recording correctly	

Expected Result:
PVR IRD supporting HEVC correctly records and plays back the HEVC video content.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-14.3:1 PVR: Maximum number of simultaneous recordings**
Section	FiCom Unified 4.0, Chapter 14.2
Requirement	14.3-1
Test Procedure	**Purpose of test:** To verify IRD capability to handle simultaneous recordings dynamically according to available descrambling resources. **Equipment:**

Live signal
IRD under test
CI+CAM and/or smart card with subscription

Test Procedure

1. Access EPG/ESG
2. Schedule as many multiple simultaneous recordings as possible.
3. Observe the IRD behavior
4. Wait until recording has completed.
5. Observe the resulted recordings.
6. Fill in the measurement record.

Measurement record:

Test Point	**OK/NOK**
IRD gives an indication if its resources for simultaneous recording will exceed	
IRD does not allow user to schedule more simultaneous recordings than it can record	
IRD records as many simultaneous recordings as it allows the user to schedule.	

Expected Result:
IRD has a conflict handling and is able to handle simultaneous recordings.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-14.3:2 PVR: Management of external storage mass media**
Section	FiCom Unified 4.0, Chapter 14.2
Requirement	14.3-3
Test Procedure	**Purpose of test:** To verify IRD mass media handling. ***This task is applicable only for IRDs without integrated PVR storage mass media. Requirement for PVR IRDs with integrated PVR storage is tested in PVR: NorDig.*** **Equipment:** Live signal IRD under test PVR storage mass media **Test Procedure:**

1. Attach a blank mass media.
2. Verify the IRD has a mechanism for initiating the mass media.
3. Observe the IRD behavior
4. Fill in the measurement record

Measurement record:

Test Point	OK/NOK
IRD has a mechanism for initializing a mass media for its own use.	
IRD asks for user confirmation before the initialization.	

Expected Result:
PVR IRD correctly handles scrambled content.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-14.5:1 PVR: Navigator and user preferences**
Section	FiCom Unified 4.0, Chapter 14.2
Requirement	14.5-4
Test Procedure	**Purpose of test:** To verify IRD allows user to set the user preferences during an active recording. **Equipment:** Live signal IRD under test **Test Procedure:** 1. Initiate a recording. 2. Access the IRD Navigator. 3. Try to change user preference for subtitling language. 4. Try to change user preference for audio output format. 5. Observe the IRD behavior. 6. Stop the recording. 7. Play back the recording. 8. Observe the subtitling and audio components. 9. Fill in the measurement record. **Measurement record:**

Test Point	OK/NOK
IRD allows the user to access the menu system while recording.	
IRD allows the user to change user preferences while recording.	

	Changing user preferences do not cause harm to the recording.			
	Expected Result: PVR IRD correctly handles user preferences during recording.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-14.6:1 PVR: System time management**
Section	FiCom Unified 4.0, Chapter 14.6
Requirement	12-1, 14-0, 14.6-1
Test Procedure	**Purpose of test:** To verify IRD system time handling. ***This task is optional for IDTV IRDs without integrated PVR storage mass media.*** **Equipment:** Live signal or a test stream with EIT_schedule having multiple consecutive events. IRD under test **Test Procedure:** 1. Schedule a recording to begin after completion of test steps 2-5. 2. Set the IRD to stand-by mode. If IRD has a “stand-by scan” procedure, wait until it has completed. 3. Cut the IRD power from mains. 4. Wait for some time (e.g. 2 minutes). 5. Re-connect IRD power. 6. Observe the IRD behavior. 7. Fill in the measurement record. **Measurement record:**

Test Point	**OK/NOK**
IRD retains the system time after a power cut.	
IRD returns back to the originating power state after a power cut	
IRD is able to perform the scheduled recording in time after a power cut.	

Expected Result:

	PVR IRD correctly handles scrambled content.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-14.6:2 PVR: Changes in TDT/TOT**
Section	FiCom Unified 4.0, Chapter 14.6
Requirement	14.6-2
Test Procedure	**Purpose of test:** To verify IRD handles daylight saving changes. To verify IRD is able to perform recording at correct time after changes between summer time and normal time. This test may be performed in parallel with NorDig Test Plan 2.6.0 task 15:33. **Equipment:** Stream with time offset change and EIT_schedule with events before and after a time offset change. IRD under test **Test Procedure:** 1. Access the EPG/ESG. 2. Schedule a recording for an event after the time offset change indicated in the *time_of_change* field in the *local_time_offset_descriptor* of TOT. 3. Set the IRD to standby. 4. Wait until the time event for the time offset change has been passed. 5. Observe the IRD behavior. 6. Resume the IRD from standby. 7. Play back the recording. 8. Fill in the measurement record. **Measurement record:** **Test Point** / **OK/NOK** IRD is able to utilize the *local_time_offset_descriptor* information. / Time offset change from summer time to normal time is handled correctly / Time offset change from normal time to summer time is handled correctly / **Expected Result:** PVR IRD correctly handles time offset change.
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments

Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:		
Date		Sign	

Test Case	**FiCom-15.1:1 HbbTV support**
Section	FiCom Unified, Chapter 15.1-1
Requirement	IRD following the NorDig Hybrid specification **shall** support all mandatory features and requirements of HbbTV v1.5 as specified in ETSI TS 102 796 v1.2.1 [12] specification (including HbbTV Errata 1 [13], Errata 2 [14] and Errata 3 [15]), NorDig Unified Specification [1] plus the extensions and clarifications in this document.
Test Procedure	**Purpose of test:** To verify IRD compliance to HbbTV. Related to task *FiCom-15.1:1* . **Test Procedure:** Manufacturer shall provide HbbTV Test Suite test report, including the Nordig Test Tasks. **Expected Result:** A verified Test report is produced.
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:
Date	Sign

Test Case	**FiCom-15.1:2 Playready support**
Section	FiCom Unified, Chapter 15.1-2, 15.2.4
Requirement	IRD following the NorDig Hybrid specification IRD shall support at least Microsoft PlayReady DRM SDK version 2.9. In the future, additional DRMs may be required according to the evolution of the market.
Test Procedure	**Purpose of test:** To verify IRD compliance to PlayReady DRM. **Test Procedure:**

	Playout PlayReady DRM protected content (location TBA). Check that all the following work: 1. license embedded in segment files 2. pre-fetch via LA URL within the MPD file 3. using OIPF DRMAgent API **Expected Result:** PlayReady DRM protected content can be played.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-15.1:3 HbbTV Test Suite compliance**
Section	FiCom Unified, Chapter 15.1-3
Requirement	IRD manufacturers shall present a certificate of passing the tests for HbbTV v1.5 and the additional NorDig-specific test tasks by the latest available HbbTV Test Suite. NOTE: Presenting the certificate does not prevent the operator conducting same test suites to verify the results.
Test Procedure	**Purpose of test:** To verify IRD compliance to HbbTV. Related to task *FiCom-15.1:1* . **Test Procedure:** Manufacturer shall provide HbbTV Test Suite test report, including Nordig Test Tasks. **Expected Result:** A verified Test report is produced.
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:

Date		Sign	

Test Case	**FiCom-15.1:4 Device capabilities and DRMSystemID**
Section	FiCom Unified, Chapter 15.1-4, 15.2.4
Requirement	The device capabilities shall be returned by the application/oipfCapabilities object. The xmlCapabilities property of the application/oipfCapabilities object shall provide the DRMSystemID of the DRM supported by the receiver.
Test Procedure	**Purpose of test:** To verify IRD output of the oipfCapabilities and DRMSystemID properties. **Test Procedure:** Run the oipfCapabilities test application (location TBD). Capabilities and supported DRM shall be displayed. DRMSystemID shall indicate support for PlayReady DRM. **Expected Result:** IRD fulfills the requirement.
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:
Date	Sign

Test Case	**FiCom-15.1:5 Application lifecycle shall not disturb A/V**
Section	FiCom Unified, Chapter 15.1-5
Requirement	Starting and stopping applications shall not cause any A/V glitch when that application has not modified the broadcast video.
Test Procedure	**Purpose of test:** To verify that starting and stopping HbbTV applications do not interfere with A/V presentation in the IRD. **Test Procedure:**

	1. Tune to a service containing HbbTV application which does not modify broadcast video [for example yle_tv1_2016.ts]. 2. Check that HbbTV application starts by verifying the presence of the red button prompt. 3. Kill the HbbTV application by pressing EXIT key on the IRD. 4. Verify that A/V presentation remains undisturbed. **Expected Result:** IRD fulfills the requirement.
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:
Date	Sign

Test Case	**FiCom-15.1:6 DSMCC Stream Event support**
Section	FiCom Unified, Chapter 15.1-6
Requirement	A "do it now" DSMCC stream event shall be executed by the receiver in less than 2s. Execution time is measured from the time the event is received at RF interface to the time the event is raised to the API/Application.
Test Procedure	**Purpose of test:** Verify the performance of the Stream Event API. **Test Procedure:** This is tested in Nordig HbbTV Test tasks 16:14 and 16:15. Run these tests and measure the time spent on raising the event. **Expected Result:** IRD fulfills the requirement.
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:
Date	Sign

Test Case	**FiCom-15.1:7 Stability**
Section	FiCom Unified, Chapter 15.1-7
Requirement	Reliability shall be ensured by running the following procedure on applications available from the production broadcast signal at the time of certification project. The TV shall complete this test without any effect on stability. a. An application is opened and closed by the user 20 times consecutively. b. The user changes the program selection before the application has been completely loaded, whether from broadcast or broadband. c. A broadband application download is prematurely interrupted by a TCP connection reset, or a sustained packet loss.
Test Procedure	**Purpose of test:** To verify the stability of the HbbTV stack when application is repeatedly opened and closed, channel is constantly changed and broadband connectivity is disturbed. **Test Procedure:** 1. Tune to Yle TV1 of the DVB-T broadcast signal, either live or recording. 2. After the red button appears, press EXIT. Repeat 20 times 3. Zap between Yle TV1, Yle TV2, Yle Fem and Yle Teema repeatedly, going through the channels at least 20 times. Repeat step 1 and 2. 4. Disconnect and re-connect the Broadband connection after each channel change at least 20 times. **Expected Result:** Stability remains good. Applications can be loaded and A/V is error-free.
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:
Date	Sign

Test Case	**FiCom-15.1:8 HbbTV Stack protection from DVB stack**
Section	FiCom Unified, Chapter 15.1-8
Requirement	HbbTV stack shall be adequately protected from the DVB stack to not cause any interruption in broadcast reception if a malfunctioning application is broadcasted.
Test Procedure	**Purpose of test:** To ensure that malfunctioning HbbTV app does not affect the broadcast stack or A/V reception. **Test Procedure:**

	Manufacturer shall provide architectural description describing how the DVB stack is protected from the HbbTV / Browser stack. **Expected Result:** Malfunctioning HbbTV application cannot crash the DVB stack or the IRD.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-15.1:9 Version and profile signaling**
Section	FiCom Unified, Chapter 15.1-9
Requirement	IRD should not launch applications which are signaled as using a version of profile of HbbTV they do not support. Applications should check whether the receiver supports the features they require.
Test Procedure	**Purpose of test:** To verify that HbbTV IRDs do not launch applications which are signaled using profiles, features or levels they do not support. **Test Procedure:** This requirement is tested in the org.hbbtv_APPSIGxxxx test id's of the HbbTV Test Suite Test list [15]. **Expected Result:** IRD fulfills the requirement.
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:
Date	Sign

Test Case	**FiCom-15.1:10 EXIT key**			
Section	FiCom Unified, Chapter 15.1-10			
Requirement	EXIT function shall work as specified in the NorDig Unified Specification [1].			
Test Procedure	**Purpose of test:** To verify the functionality of the EXIT button. **Test Procedure:** This requirement is tested in Nordig HbbTV Test Tasks 16:22, 16:55 16:56 and 16:57. **Expected Result:** IRD fulfills the requirement.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-15.1:11 TELETEXT key**
Section	FiCom Unified, Chapter 15.1-11
Requirement	Teletext button shall exist and work as specified in the NorDig Unified Specification [1].
Test Procedure	**Purpose of test:** To verify the functionality of the TELETEXT button. **Test Procedure:** This requirement is tested in Nordig HbbTV Test Tasks 16:5, 16:6, 16:7, 16:8, 16:9, 16:10 and 16:60. **Expected Result:**

	IRD fulfills the requirement.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-15.1:12 HbbTV enabled setting**			
Section	FiCom Unified, Chapter 15.1-12			
Requirement	HbbTV shall be enabled by default.			
Test Procedure	**Purpose of test:** To verify that HbbTV is enabled after factory setting. **Test Procedure:** **1.** Perform factory reset. **2.** After FTI, check that HbbTV is enabled. **Expected Result:** IRD fulfills the requirement.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-15.1:13 HbbTV Autostart setting**
Section	FiCom Unified, Chapter 15.1-13
Requirement	HbbTV autostart option, if offered, shall be enabled by default.
Test Procedure	**Purpose of test:** To verify that autostart option is turned ON after factory reset.

	Test Procedure: This requirement is tested in Nordig HbbTV Test Task 16:58. **Expected Result:** IRD fulfills the requirement.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-15.1:14 EBU-TT subtitle support (Optional)**
Section	FiCom Unified, Chapter 15.1-14
Requirement	Subtitles should be supported as specified in HbbTV 2.0.1 chapter “7.3.1.5 Subtitles”. a. IRDs supporting HbbTV 2.0.1 shall provide support for TTML-based broadband subtitles as specified in 7.3.1.5.1.
Test Procedure	**Purpose of test:** To verify IRD compliance TTML (EBUTTD) subtitles. **Test Procedure:** This requirement is tested in org.hbbtv_SUBxxxx test ids in the HbbTV Test Suite Test list [15]. **Expected Result:** IRD fulfills the requirement.
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:

Date		Sign	

Test Case	**FiCom-15.1:15 Navigator indicator for HbbTV Apps**			
Section	FiCom Unified, Chapter 15.1-15			
Requirement	The presence of broadcast-related HbbTV services should be indicated to the consumer in the manufacturer provided user interface (e.g. info banner after channel change).			
Test Procedure	**Purpose of test:** To verify that IRD has a symbol for indicating presence of HbbTV apps. **Test Procedure:** Manufacturer shall provide the description of the functionality. **Expected Result:** IRD fulfills the requirement.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-15.2:1 Unicast streaming**
Section	FiCom Unified, Chapter 15.2.1
Requirement	IRD shall provide support for unicast streaming as defined in clause 7.3.2.1 of [12]. (ETSI TS 102 796 1.2.1)
Test Procedure	**Purpose of test:** To verify support for the unicast non-adaptive streaming. **Test Procedure:**

	This requirement is tested in org.hbbtv_00002510 - org.hbbtv_00002600 of the HbbTV Test Suite Test list [15]. **Expected Result:** The IRD fulfills the requirement.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date			Sign	

Test Case	**FiCom-15.2:2 MPEG DASH Support**			
Section	FiCom Unified, Chapter 15.2.2-1			
Requirement	IRD shall provide support for DASH HbbTV ISOBMFF Live profile as defined in [12] (ETSI TS 102 796 1.2.1). Other profiles may be supported.			
Test Procedure	**Purpose of test:** To verify support for the appropriate DASH profile in the IRD. **Test Procedure:** The requirement is tested in the org.hbbtv_DAxxxxxx test tasks of the HbbTV Test Suite Test list [15]. Requirement is also tested during field tests of the IRD (Ficom Field Test). **Expected Result:** IRD fulfills the requirement.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date			Sign	

Test Case	**FiCom-15.2:3 Initialization of DASH segments**			
Section	FiCom Unified, Chapter 15.2-2			
Requirement	IRD shall support initialization file of MPEG DASH segments that can be unique for each representation specified in DASH MPD.			
Test Procedure	**Purpose of test:** TBD **Test Procedure:** TBD **Expected Result:** TBD			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-15.2:4 Live DASH seeking**
Section	FiCom Unified, Chapter 15.2-3
Requirement	Live DASH shall support seeking (backwards within the buffer and forward to present playtime) within the DVR window, if specified in MPD with “timeShiftBufferDepth”.
Test Procedure	**Purpose of test:** To verify that timeShiftBufferDepth value is interpreted correctly. **Test Procedure:** This requirement is tested in the HbbTV Test Suite v9.2.1 Test id org.hbbtv_HTML5-DASH016, org.hbbtv_HTML5-DASH017, org.hbbtv_HTML5-DASH019 and org.hbbtv_HTML5-DASH020 in the HbbTV Test Suite Test list [15]. **Expected Result:**

	IRD fulfills the requirement.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-15.2:5 Disabling trick play modes for broadband content**
Section	FiCom Unified, Chapter 15.2.3-1
Requirement	The receiver shall allow the HbbTV application to control the Play, Pause, Stop, Fast Forward and Fast Rewind keys as defined in [12]. This will enable the service provider to disable trick modes when required.
Test Procedure	**Purpose of test:** TBD **Test Procedure:** TBD **Expected Result:** TBD
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:
Date	Sign

Test Case	**FiCom-15.2:6 Trick play modes for broadband content**
Section	FiCom Unified, Chapter 15.2.3-2
Requirement	Service providers should always request the Play, Pause, Stop, Fast Forward and Fast Rewind keys when playing broadband content. If any trick mode function is not supported, the application should display a suitable message to the user when the relevant key is pressed.

Test Procedure	**Purpose of test:** Test the functionality of Play, Pause, Stop, Fast Forward and Fast Rewind keys when playing broadband content. **Test Procedure:** Start playing of Broadband content **Expected Result:** All keys work as expected.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-15.3:1 Security: Application ID ranges**			
Section	FiCom Unified, Chapter 15.3-2			
Requirement	Trusted and non-trusted application id ranges and API restrictions shall be observed.			
Test Procedure	**Purpose of test:** To verify the correct behavior of the two levels of trust for applications - trusted and not trusted. **Test Procedure:** This requirement is tested in HbbTV Test Suite 9.2.1 Test tasks org.hbbtv_00000990 - org.hbbtv_00001210 from HbbTV Test Suite Test list [15]. **Expected Result:** IRD fulfills the requirement.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO			

	Describe more specific faults and/or other information:		
Date		Sign	

Test Case	**FiCom-15.3:2 DRM-DASH Reference app**			
Section	FiCom Unified, Chapter 15.1-16			
Requirement				
Test Procedure	**Purpose of test:** To verify the correct behavior of the DRM-DASH Reference App test tasks. **Test Procedure:** Follow the instructions from the HbbTV DRM-DASH Reference app page at https://github.com/HbbTV-Association/ReferenceApplication and [TBA]. **Expected Result:** IRD fulfills the requirement.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

FiCom-16. Field Tests

Test Case	**FiCom-16.0:1 Field test - General operation in Terrestrial networks**
Section	FiCom Unified v4.0
Requirement	
Test Procedure	**Purpose of test:** To verify IRD operation and interoperability in live terrestrial DVB-T and DVB-T2 networks. **Equipment:** Live terrestrial signal with DVB-T and DVB-T2 networks. CI+CAM module and/or smartcard with subscription. **Test Procedure:** 1. Perform factory reset and automatic installation 2. Observe the service list 3. Access the EPG/ESG. 4. Observe the IRD behavior. 5. Insert a CI+CAM and/or smartcard and select a scrambled service. 6. Observe the IRD behavior 7. Zap through the received services. 8. Observe the IRD behavior. 9. Fill in the measurement record. **Measurement record:** **Test Point** | **OK/NOK** IRD finds all receivable services from live terrestrial signal | Service lists are correct | EPG information is processed and viewed correctly | IRD is able to access scrambled services | IRD is decodes the receivable services without issues | **Expected Result:** IRD behaves correctly in the live terrestrial networks.
Test Result(s)	
Conformity	☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:
Date	Sign

Test Case	**FiCom-16.0:2 Field test – Durability in Terrestrial networks**
Section	FiCom Unified v4.0
Requirement	
Test Procedure	**Purpose of test:**

To verify IRD durability in live terrestrial DVB-T and DVB-T2 networks.

Equipment:

Live terrestrial signal with DVB-T and DVB-T2 networks.
CI+CAM module and/or smartcard with subscription.

Test Procedure:

1. Disable power-off timers.
2. Tune to a service for a long time, e.g. 12 hours.
3. Observe the IRD behavior.
4. Fill in the measurement record.

Measurement record:

Test Point	**OK/NOK**
Service lists are correct	
EPG information is processed and viewed correctly	
Video and audio are decoded correctly in sync	
Subtitling is displayed correctly in sync	

Expected Result:
IRD behaves correctly in the live terrestrial networks.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-16.0:3 Field test –PVR in Terrestrial networks**
Section	FiCom Unified v4.0
Requirement	
Test Procedure	**Purpose of test:** To verify IRD endurance and durability in a live environment covering ordinary use cases. **Equipment:** Live Terrestrial network with MFN reception shall be used. Free and scrambled content shall be used. Both SD and HD services, preferably with subtitles, shall be used. **Test Procedure:**

1. Tune into the live signal.
2. Browse the EPG. Schedule few EIT events for recording from both free and scrambled channels in different networks, e.g. overnight.
3. OTR an event (30 minutes or longer).
4. Play back the recorded content. Do not fast forward.
5. Observe the IRD behavior.
6. Enable time-shift.
7. Wait for few minutes and view the content in delayed viewing mode.
8. Fast Forward few times for a few minutes.
9. Fill in the measurement record.

Measurement record:

Test Point	**OK/NOK**
IRD endurance and durability are verified in ordinary use cases:	
• Scheduled recordings	
• One Touch Recording	
• Timeshift	
• Playback functions	

Expected Result:
IRD PVR functionality works correctly in the live terrestrial environment

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-16.0:4 Field test - General operation in Cable networks**
Section	FiCom Unified v4.0
Requirement	
Test Procedure	**Purpose of test:** To verify IRD operation and interoperability in live cable networks. **Equipment:** Live cable signal CI+CAM module and/or smartcard with subscription. This test shall be performed at least in the following Cable networks: • DNA • Elisa • Telia **Test Procedure:** 1. Perform factory reset and automatic installation 2. Observe the service list 3. Access the EPG/ESG. 4. Observe the IRD behavior. 5. Insert a CI+CAM and/or smartcard and select a scrambled service. 6. Observe the IRD behavior 7. Zap through the services. 8. Observe the IRD behavior. 9. Fill in the measurement record. **Measurement record:**

Test Point	**OK/NOK**
Network: DNA	
IRD finds all services from live cable signal	
Service lists are correct	
EPG information is processed and viewed correctly	
IRD is able to access scrambled services	
IRD decodes the services without issues	
Network: Elisa	
IRD finds all services from live cable signal	
Service lists are correct	
EPG information is processed and viewed correctly	
IRD is able to access scrambled services	
IRD decodes the services without issues	
Network: Telia	
IRD finds all services from live cable signal	
Service lists are correct	
EPG information is processed and viewed correctly	
IRD is able to access scrambled services	
IRD decodes the services without issues	

Expected Result:
IRD behaves correctly in the live cable networks.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-16.0:5 Field test – Durability in Cable networks**
Section	FiCom Unified v4.0
Requirement	
Test Procedure	**Purpose of test:** To verify IRD durability in a live cable network. **Equipment:** Live cable signal. CI+CAM module and/or smartcard with subscription. **Test Procedure:** 1. Disable power-off timers. 2. Tune to a service for a long time, e.g. 12 hours. 3. Observe the IRD behavior. 4. Fill in the measurement record. **Measurement record:** **Test Point** | **OK/NOK** Service lists are correct | EPG information is processed and viewed correctly | Video and audio are decoded correctly in sync | Subtitling is displayed correctly in sync | **Expected Result:** IRD behaves correctly in the live cable networks.

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-16.0:6 Field test –PVR in Cable networks**
Section	FiCom Unified v4.0
Requirement	
Test Procedure	**Purpose of test:**

To verify IRD endurance and durability in a live network utilizing 'normal use cases'.

Equipment:

Live Cable network shall be used.
Free and scrambled content shall be used.
Both SD and HD services, preferably with subtitles, shall be used.

Test Procedure:

1. Tune into the live signal.
2. Browse the EPG. Schedule few EIT events for recording from both free and scrambled channels in different networks, e.g. overnight.
3. OTR an event (30 minutes or longer).
4. Play back the recorded content. Do not fast forward.
5. Observe the IRD behavior.
6. Enable time-shift.
7. Wait for few minutes and view the content in delayed viewing mode.
8. Fast Forward few times for a few minutes.
9. Fill in the measurement record

Measurement record:

Test Point	OK/NOK
IRD endurance and durability are verified in 'normal use cases'	

Expected Result:
IRD PVR functionality works correctly in the live cable environment

Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date		Sign		

Test Case	**FiCom-16.0:7 Field test – HbbTV**
Section	FiCom Unified v4.0
Requirement	Field test of all signaled applications in the Finnish DVB networks (currently Digita DVB-T/T2)
Test Procedure	**Purpose of test:** To verify the correct behavior of the production HbbTV Applications. **Test Procedure:**

	Application provider and the network operator will provide detailed instructions on how to verify the functionality of the HbbTV Applications. **Expected Result:** IRD fulfills the requirement.			
Test Result(s)				
Conformity	☐ OK	Fault	☐ Major	☐ Minor, define fail reason in comments
Comments	If possible, describe if fault can be fixed with software update ☐ YES ☐ NO Describe more specific faults and/or other information:			
Date			Sign	