RiksTV Test Specification

for

Integrated Receiver Decoders

1 Document History

Version	Date	Comments
1.0	2007	Drafts
1.1	2008	4 Test Specification for RiksTV tests: the word “additional” is deleted from the text. 4.1 Added test case: Task 5.1 4.3 Task 7:7: minor changes, parameters “30Hz” and “60Hz” are deleted from the text. 4.3 Task 7:8: minor changes in the text. “The receiver is able to downconvert 720p and 1080i resolution to SD (576i) by verifying it with analogue TV.” 4.3 Task 7:10 Text changed: “Component video” added. 4.6 Task 11:4 Text changed: “Automatisk kanalsøk” and “Automatic channel search”. 4.6 Task 11:5 Text added: “Select region T Net1 or T Net2 (both regions shall be tested).” 4.7 Task 12:10 Text deleted: “High reception quality shall have higher priority”. This condition is tested in 3.10 Best mux test. 4.7 Task 12:11 Minor changes in the conditions. 4.8 Task 13.1 Text changed: “Add and remove service in service_list_descriptor…” Added section 4.10 Task 15: Enabling/Disabling HDCP 4.10 Added test case: Task 15.1 Added section 4.11 Task 16: Parental Control 4.11 Added test case: Task 16.1
1.1b	2009-02-06	4.10 Changed test conditions for: Task 15:1 HDCP functionality. 4.8 Changed text in task 13.3 for item 13: “Verify the receiver does not start to scan.”
1.1c	2010-01-28	4.6 Changed test procedure for: Task 11:5 “Channel search – Best service selection”
2.0	2011-02-28	Major rewriting for all chapters.

2 References

This test specification relates to the following documents:

[1] NorDig Unified Test Specification v2.2
[2] NorDig Unified Specification v2.2.1
[3] Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems, ETSI EN 300 468 V1.7.1 (2006-05).
[4] Digital Video Broadcasting (DVB); Guidelines on implementation and usage of Service Information (SI), ETR 211 August 1997 Second Edition.
[5] Information technology — Generic coding of moving pictures and associated audio information: Systems. ISO/IEC 13818-1. ISO / IEC
[6] Digital Video Broadcasting (DVB); Specification for System Software Update in DVB Systems, ETSI TS 102 006. Version 1.3.1.
[7] EICTA “HDTV” Minimum Requirements for HD Television Receivers, 25-08-2005
[8] Digital Video Broadcasting (DVB); Implementation guidelines for the use of Video and Audio Coding in Broadcasting Applications based on the MPEG-2 Transport Stream, ETSI TS 101 154 V1.7.1, (2005-06)

[9] High-Definition Multimedia Interface", rev. 1.0, December 9, 2002
[10] High-Bandwidth Digital Content Protection System", rev. 1.1, June 9, 2003
[11] Digital Video Broadcasting (DVB); Subtitling systems, ETSI EN 300 743 V1.3.1, (Final Draft, 2006-07).
[12] DTS coherent acoustics; Core and extensions; ETSI TS 102 114 v1.2.1, 2002-12
[13] MPEG Audio Coding , ISO/IEC 11172-3
[14] DVB System, ETSI EN 300 421
[15] AES3, latest version
[16] NTV Basic IRD Specifications DTT Norway v2.0
[17] RiksTV SSU Test specification for IRD v1.2.3

3 Signing of test report

Each individual test case shall be performed; test result and conformity shall be reported and signed.

In case that the test result indicates a non-compliance (with the specified requirement) the level of the non-compliance shall be evaluated and indicated by ticking the corresponding "box" in the conformity field. If such non-compliance can be removed by an upgrade of the IRD software, this shall be indicated by ticking the correct commentary field for the individual test. The manufacturer should describe the non-compliance and plans to correct it in the "Comments" row.

The Information specified for the "Test item" shall be provided, see section 6.1.

3.1 Test item

The information of the Test Item shall be inserted to the following table. The tests shall be performed with the same IRD model (HW/SW) in all test cases.

Table 3.1 Test Item

Test Item	
Manufacturer:	
Model:	
S/N(s):	
SW version:	
HW version:	
Front-End:	
Demux:	
Processor:	
Memory size:	
MHP Profile:	
NorDig Profile:	
Other relevant information:	

Following information shall be entered to Table 3.1:

Manufacturer:	The name of the manufacturer of the tested IRD
Model:	The model (to be deployed to NorDig market) of the tested IRD
S/N(s):	The serial numbers of all IRDs which are used in the tests
SW version:	The SW version of the tested IRD model
HW version:	The HW version of the tested IRD model
Front-End:	The front-end type and model of the tested IRD
Demux:	The Demux type and model of the tested IRD
Processor:	The Processor type and model of the tested IRD
Memory size:	The memory size of the tested IRD
MHP Profile:	The MHP profile of the tested IRD (Not relevant for NorDig Basic/NorDig I)
NorDig Profile	The NorDig profile of the tested IRD
Other relevant information:	The other relevant information that the IRD manufacturer feels important

4 Test Specification for RiksTV tests

4.1 Task 4: IRD interfaces and hardware requirements

Test Case	***Task 4:1 Terrestrial tuner and demodulator – NorDig requirements***
Section	NorDig Unified Test Specification [1] Ch2.3 Task 3
Requirement	
Test procedure	**Purpose of test:** Verify NorDig requirements. **Equipment:** **Test procedure:** **Expected result:** The IRD fulfills NorDig 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	***Task 4:2 Extended frequency range and 7/8MHz raster***
Section	Ch4 Riks TV Basic IRD Specifications DTT Norway
Requirement	The front end of the IRD shall be able to receive all channels in the whole range of frequencies from 174MHz to 862 MHz (7&8 MHz raster within the VHF bands and 8 MHz within the UHF bands).

	Band	**Frequency range**	**Raster**	**Bandwidth**	**Requirement**
VHF	VHF I	47 – 68 MHz	N/A	N/A	Not applicable
	S Band I	104 – 174 MHz	7 & 8 MHz	7 & 8 MHz	Optional
	VHF III	174 – 230 MHz	7 & 8 MHz	7 & 8 MHz	Mandatory
	S Band II	230 – 300 MHz	7 & 8 MHz	7 & 8 MHz	Mandatory
UHF	S Band III	300 – 470 MHz	8 MHz	8 MHz	Mandatory
	UHF IV	470 – 606 MHz	8 MHz	8 MHz	Mandatory
	UHF V	606 – 862 MHz	8 MHz	8 MHz	Mandatory

Test procedure	**Purpose of test:** To verify that IRD can tune to mandatory center frequencies in table above. (See NorDig Unified Test Specification [1] Task 3.4) **Equipment:** IRD Under test **Test procedure:** Follow NorDig Unified Test Specification [1] Task 3.4 including optional frequencies. **Expected result:** The tested IRD shall be able to tune to tested centre frequencies.		
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	***Task 4:3 Support for 7 and 8MHz signal Bandwidth***		
Section	Ch4 Riks TV Basic IRD Specifications DTT Norway		
Requirement	The centre frequencies for 7 and 8 MHz raster and definition of signal bandwidths shall be according to NorDig Unified [2].		
Test procedure	**Purpose of test:** To verify that IRD is able to support 7 and 8 Mhz signal Bandwidth **Equipment:** IRD under test. **Test procedure:** Follow NorDig Unified Test Specification [1] test task 3.6 including optional signal bandwidth. **Expected result:** 7 and 8MHz signal bandwidth is supported.		
Test result(s)	The manufacturer describes his specific setup for the test		
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	***Task 4:4 RF output power source (5V 50mA)***
Section	Ch4 Riks TV Basic IRD Specifications DTT Norway
Requirement	The RF connector shall provide 5V, 50mA antenna power supply, it shall be short-circuit protected to ensure that a permanent short circuit don't harm the receiver and shall not provide more than 50mA current. 5V power supply for active antennas is recommended, but not mandatory for IDTVs

Test procedure	**Purpose of test:** To verify that the IRD can provide required antenna power supply (5V 50mA) and is able to handle short circuit of the connector. **Equipment:** IRD under test, short circuit connector and 100Ohm **Test procedure:** Short circuit the antenna output connector and verify that the RF input is not damaged. Use the 100Ohm load to measure the outputted current and voltage. **Expected result:** The IRD delivers 5V and 50mA and is not damaged by the short circuit (optional for IDTVs)
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	***Task 4:5 HDMI output***
Section	Ch4 Riks TV Basic IRD Specifications DTT Norway
Requirement	STBs shall have one HDMI output interface. Please see NorDig Unified Specifications [2] for details on HDMI interface in NorDig receivers.
Test procedure	**Purpose of test:** To verify that the IRD (STB) has an HDMI output. **Equipment:** IRD under test. **Test procedure:** Verify that the receiver is equipped with a HDMI output. **Expected result:** Receiver is equipped with HDMI output.
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	***Task 4:6 HDMI with HDCP***
Section	Ch4 Riks TV Basic IRD Specifications DTT Norway
Requirement	The HDMI output interface shall be protected with HDCP as defined by NorDig [2] and in chapter 14 [16].

Test procedure	**Purpose of test:** **Equipment:** **Test procedure:** This requirement is tested in Task 14:1 "HDCP functionality". **Expected result:**
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	***Task 4:7 Smart Card and Common Interface slot***
Section	Ch4 Riks TV Basic IRD Specifications DTT Norway
Requirement	STBs shall include one Smart Card interface, ISO-7816-3 (1997) with amendment 1 (2002). Please see chapter 16.1 [16] for details on embedded Conditional Access. Note: Common Interface Plus, as specified in NorDig Unified Specification [2], is mandatory on all IDTVs, from January 1st 2011. All IDTVs, independent of screen size, shall have either one Common Interface slot or one smart card interface as defined above.
Test procedure	**Purpose of test:** To verify that the IRD is equipped with an SMC reader (STB) or CI+ (IDTV). **Equipment:** IRD under test. **Test procedure:** Verify that the IRD has a Smart Card Reader (STB) or Common Interface Plus (IDTV). **Expected result:** IRD (STB) is equipped with a SMC reader. SMC reader is optional for IDTV. CI+ is mandatory for IDTVs.
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	***Task 4:8 Analogue audio output***
Section	Ch4 Riks TV Basic IRD Specifications DTT Norway
Requirement	Stereo audio, analog audio interface connectors should be Two Cinch connectors, female type IEC 60603-14

Test procedure	**Purpose of test:** To verify that the IRD has analogue Stereo Audio output and type of the connectors. **Equipment:** IRD under test. **Test procedure:** 1. Verify what analogue stereo connectors the IRD is equipped with. 2. Audio formats is tested in chapter 4.4. **Expected result:** Two Cinch connectors are optional. Preferable are two Cinch connectors.		
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	***Task 4:9 Front panel buttons***		
Section	Ch4 Riks TV Basic IRD Specifications DTT Norway		
Requirement	The IRD shall include keys on the front panel to be able to control the basic functionality of the IRD without RCU, i.e.: 1. Stand-by. 2. P+/P- , to be able to switch service up and down.		
Test procedure	**Purpose of test:** To verify that the IRD has required front panel buttons. **Equipment:** IRD under test. **Test procedure:** 1. Verify that the buttons are working. **Expected result:** Front panel buttons are working		
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***	

4.2 Task 5: Remote Control Unit (RCU)

<table>
<tr><td>Test Case</td><td>Task 5:1 Remote control unit buttons</td></tr>
<tr><td>Section</td><td>Ch5 Riks TV Basic IRD Specifications DTT Norway</td></tr>
<tr><td>Requirement</td><td>The RCU shall include the following functions associated to one unique key:

<table>
<tr><th>Function</th><th>Keys</th></tr>
<tr><td>Channel up/down</td><td>P+/P-</td></tr>
<tr><td>Volume</td><td>V+/V-</td></tr>
<tr><td>Toggle audio on/off</td><td>Mute</td></tr>
<tr><td>In/out of standby</td><td>Stand-by</td></tr>
<tr><td>Navigation</td><td>Left/Right/Up/Down</td></tr>
<tr><td>Selection</td><td>OK</td></tr>
<tr><td>Context dependent</td><td>Red/Green/Yellow/Blue</td></tr>
<tr><td>Number entry</td><td>0-9</td></tr>
<tr><td>Link to ESG</td><td>Info</td></tr>
<tr><td>Link to EPG</td><td>Guide</td></tr>
<tr><td>Link to IRD settings</td><td>Menu</td></tr>
<tr><td>Teletext</td><td>Text</td></tr>
<tr><td>Toggle subtitling on/off</td><td>Subtitling</td></tr>
<tr><td>Exit back to TV</td><td>Exit</td></tr>
<tr><td>Toggle Radio/TV mode</td><td>Radio/TV</td></tr>
</table>

The keys should be marked with symbols or industry standard layout or in Norwegian. The RCU should have embossement on button “5” to guide visually impaired hearing.

The RCU for the IDTV is not required to have all the buttons defined in ch5. All functions defined for the RCU in ch5 shall be easily available in the menu system if not directly associated with a unique RCU button.</td></tr>
<tr><td>Test procedure</td><td>Purpose of test:
To verify that the remote control unit has the keys according to the requirement above.

Equipment:
The IRD under test and corresponding remote control unit.

Test procedure:
1. Verify that the remote control unit has the required keys.
2. Verify that they work correctly.

Expected result:
RCU is OK.</td></tr>
<tr><td>Test result(s)</td><td></td></tr>
<tr><td>Conformity</td><td>☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments</td></tr>
</table>

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

4.3 Task 6: Video

Test Case	***Task 6:1 Video format support – NorDig requirements***		
Section	Ch6 Riks TV Basic IRD Specifications DTT Norway		
Requirement	The IRD shall comply with the video requirements for NorDig Basic@M4Level profile defined in NorDig Unified specification [2]. The received shall be able to handle a PTS/PCR offset up to 5 seconds. The automatic setting for HDMI video output shall be 1080i, but when 720p content is received, the resolution shall automatically change to the incoming format.		
Test procedure	**Purpose of test:** To verify that the IRD supports requirements in NorDig Unified specifications [2]. **Equipment:** **Test procedure:** See NorDig Unified Test specification [1] Tasks 5:6 to 5:17 (MPEG-2 video decoder related test tasks) and Tasks 5:28 to 5:36 (MPEG-4 video decoder related test tasks). **Expected result:** Conformity of the IRD is handled in NorDig test specification [1].		
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***	

4.4 Task 7: Audio

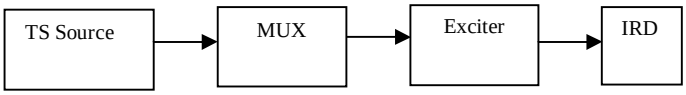
Test Case	***Task 7:1 Audio format support – NorDig requirements***
Section	Ch7 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall comply with the audio requirements for HDTV IRDs given in the Nordig Unified specifications [2]. The following clarifications and additional requirements apply to the Norwegian DTT network: 1. “System A: E-AC3 with ability to transcode to AC3” is optional. 2. “System B: HE AAC with ability to transcode to AC3 or DTS” is mandatory.

Test procedure	**Purpose of test:** To verify that the IRD supports requirements in NorDig specification [2]. **Equipment:** **Test procedure:** See NorDig Unified Test specification [1] Tasks 5:19-5:27 (M2 level) and Tasks 5:37-5:54 (M4 level). **Expected result:** Conformity of the IRD is handled in NorDig test specification [1].		
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***	

4.5 Task 8: IRD installation

Test Case	***Task 8:1 IRD installation – first start up***		
Section	Ch8 Riks TV Basic IRD Specifications DTT Norway		
Requirement	At first start-up the viewer shall be guided through the installation.		
Test procedure	**Purpose of test:** To verify that the user is guided through the first time installation. **Equipment:** IRD under test **Test procedure:** Perform a first time installation. **Expected result:** Verify that the installation of the receiver is easy to follow.		
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***	

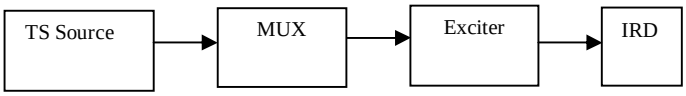
Test Case	***Task 8:2 IRD installation – default settings for "factory reset"***
Section	10 Riks TV Basic IRD Specifications DTT Norway

Requirement	All parameters shall be set to an accurate default value, see Section A.2. These parameters shall be possible to alter in the menu for non-default settings. It shall be possible to repeat the IRD installation procedure by selecting "factory reset" in the menu system. A factory reset shall not delete any Conax related information that is received from the network for storage in persistent memory.
Test procedure	**Purpose of test:** To verify that the IRD has a "factory reset" in the menu system and that all parameters are set to an accurate default value. **Equipment:**  The TS shall be recorded from one mux in the Norwegian DTTV Network. At least one of the services shall contain DVB subtitling. **Test procedure:** 1. Perform a "factory reset". 2. Verify that all deafault values are set according to the table bellow and is possible to alter. **Expected result:** That the IRD has "factory reset" in the menu system and the following settings shall default be sett according to the table bellow.

	Default IRD setting
Default channel list:	All Services List
Hearing/Visual impaired:	Off
Default subtitling method:	DVB-subtitling
Secondary subtitling method:	Teletext subtitling
TV SCART	CVBS . If supported by the IRD, it is recommended that both CVBS and RGB are enabled in parallel and that this is the default setting.
VCR SCART	CVBS
Power supply for active antenna:	On
Automatic standby	4 hours
	Language settings
Menu and pop-up	Norwegian
Sound track (primary)	Norwegian
Sound track (secondary)	English
Subtitling (primary)	Norwegian
Subtitling (secondary)	English
Teletext	Norwegian
Default PIN code	1234

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***	

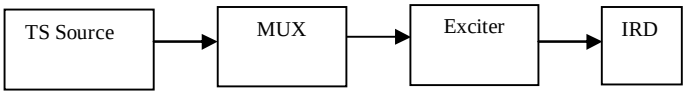
Test Case	***Task 8:3 IRD installation – selection of favorite Network***
Section	Ch8 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall follow the following principle during the installation: 1. The IRD shall automatically set country setting and use this information for other default settings in the box. (Country setting is obviously Norway in this IRD). Automatic country setting to Norway is not required for IDTV. The IDTV may display a list with countries for the user to choose from. 2. A multiple choice menu shall be presented, where the user chose TV-Set (aspect ratio). It is not required that the IDTV shall prompt the user for screen resolution. 3. The IRD shall start a complete service scan and display the progress. 4. If during scanning the IRD finds several networks (i.e. several Norwegian NITs) it shall: a. Present a list with all network names found that is associated to the country setting (here Norway). The name shall be presented according to the *network_name_descriptor* in the NIT. The list of network names shall be sorted alphabetically. Network names from non-Norwegian networks shall not be listed in favourite region selection. b. The user shall chose favourite network from the list. The IRD shall store the favourite network. (This parameter is used to build up the service lists) c. It shall be possible to change the selected favourite network later on via the menu. This will generate rearrangement of the service list. 5. Ready.

Test procedure	**Purpose of test:** To verify that the installation process works as described and that the user is able to select a favorite network from a list during a quick installation in case of more than one Norwegian NIT's cane be received. **Equipment:**  The TS shall be a copy of one mux in the Norwegian DTTV Network. At least one of the services shall contain DVB subtitling. **Test procedure:** 1. Perform an installation. 2. Verify that the country setting is Norway (STB) Not required for IDTV. 3. Verify that the user is able to select aspect ratio from a multiple choice menu. (STB) Not required for IDTV. 4. Verify that the receiver starts a complete service scan and displays the progress. 5. If more than one NIT actual (within ONID= 8770) is received the user shall be able to select favorite network from a list. 6. Verify that the list displays the network names of the received networks. 7. Verify that it is possible to change the favorite network in the menu once the quick installation is finished. 8. **Expected result:** That the installation initates a complete service scan, that the country setting is set to Norway and that the user is able to select the aspect ratio. (STB)
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***

4.6 Task 9: Service scan

Test Case	***Task 9:1 Channel search – service scan***
Section	Ch 9 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall as quick as possible scan through the required frequencies as listed in Chapter 4 within the time specified in chapter 21.

Test procedure	**Purpose of test:** Verify that the service scan takes maximum 4 minutes and that all available frequencies are scanned. **Equipment:** The IRD under test and at least the same amount of multiplexers as used in the Norwegian DTT network. **Test procedure:** 1. Perform a service scan on the live network.(Min 3 Multiplexers.) 2. Verify that the the service scan is not experienced to be to slow. **Expected result:** That the service scan scans through the whole frequency range and is performed as fast as possible.		
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	***Task 9:2 Channel search – automatic service scan***
Section	Ch 9.1 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall remove all old services and associated settings and then store all available services in the different service lists as signalled. This scanning shall always be performed during installation and reinstallation of the IRD. Service scan shall be easily available from the menu. The scan shall be called "Automatisk kanalsøk" in Norwegian and "Automatic channel search" in English.
Test procedure	**Purpose of test:** Verify that the service scan removes all old services and associated settings and install all available services in different service lists as signaled. Verify that the old service list/s is/are delited and that all available services are installaed in differents service list as signaled. Verify that the the channel search is accessible from the IRD menu. If the menu language is set to Norwegian channel search shall be translated into "Automatisk kanalsøk" **Equipment:**  The TS shall contain several services signaled within different service lists. The IRD under test and at least the same amount of multiplexers as used in the Norwegian DTT neteork. **Test procedure:** 1. Verify that "Automatisk kanalsøk" is accecible and initiated via the IRD menu. 2. Perform a channel search. 3. Verify that all available services are installed correctly and in correct service list according to the signalization. 4. Remove one service within the multiplexer. 5. Perform a new channel search and verify that all service lists are updated correctly. 6. Verify that all associated settimgs to the removed service has been removed. **Expected result:** That "Automatisk kanalsøk" is accessible and initiated via the IRD menu. When a new channel search is performed the old service lists and all associated settings shall be deleted and all available service are installed correctly in corresponding signaled service list.
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	***Task 9:3 Channel search – manual service scan.***
Section	Ch 9.2 Riks TV Basic IRD Specifications DTT Norway
Requirement	It shall be possible for the user to clear the service list in the menu as well as manually adding services from multiplexes selected by the user. The multiplexes shall be entered as channel number The frequency used for the manual scan shall be used to receive services found, even if the services are already installed. The latest service scan, either manual or automatic, shall have precedence over previous scans. Hence, the user can use the manual scan to override the automatic scan on a certain frequency.
Test procedure	**Purpose of test:** Verify that it is possible to clear the service list in the menu as well as manually add services. **Equipment:** IRD under test **Test procedure:** 1. Verify that the manual search is accecible and initiated via the IRD menu. 2. Verify that the new service scan override previous scans. **Expected result:** That manual scan is accessible and initiated via the IRD menu.
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	***Task 9:4 Channel search – automatic maintenance scan.***
Section	Ch 9.3 Riks TV Basic IRD Specifications DTT Norway
Requirement	When the IRD is turned to STDBY, either automatically as described in chapter 20.1 [16] or manually, an automatic maintenance scan shall be initiated. The automatic maintenance scan is the same as an automatic service scan except that it shall not override manual service scan if the frequency added by the manual service scan is still available.
Test procedure	**Purpose of test:** Verify that the automatic maintenance scan does not override manual service scan if the frequency added by the manual service scan is still available. **Equipment:** IRD under test **Test procedure:** **Expected result:** Automatic maintenance scan does not override manual scan.
Test result(s)	
Conformity	☐ **OK** **Fault** ☐ Major ☐ Minor, define fail reason in comments

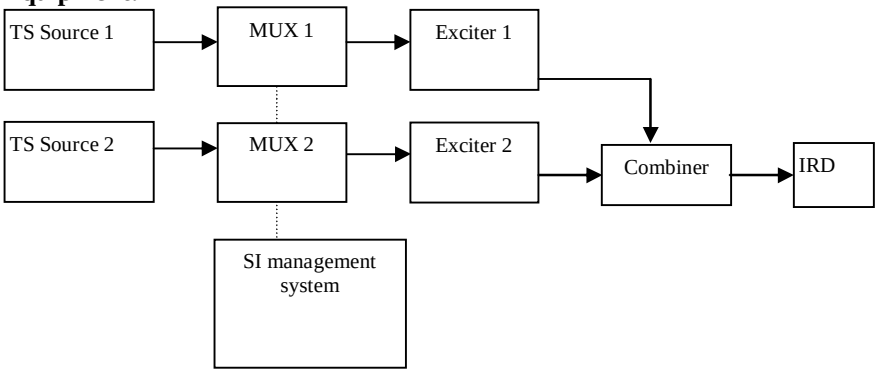
Comments	If possible describe if fault can be fixed with software update: ☐ **YES** ☐ **NO** Describe more specific faults and/or other information		
Date		***Sign***	

4.7 Task 10: Service list

<table>
<tr><td>Test Case</td><td>Task 10:1 Service lists – best service selection.</td></tr>
<tr><td>Section</td><td>Ch 10 Riks TV Basic IRD Specifications DTT Norway</td></tr>
<tr><td>Requirement</td><td>Due to the asymmetrical nature of the terrestrial network and the fact that one unique service can be receive from different transmitters (and frequencies), independent of the regions, the following rules shall apply when building the service lists:

1. A unique service shall only be listed once. Observe that a unique service is defined by its original_network_id and service_id in the terrestrial network (not transport_stream_id)

2. If the same unique service is found on several frequencies, the frequency with the best reception shall be used for that particular service. The IRD shall use the Signal Strength Indicator (SSI) and Signal Quality Indicator (SQI) as defined by Nordig Unified Specification [2] when determining the best frequency to use for a service. The Nordig Unified Specification [2] includes an appendix with implementation guidelines for selecting frequency in non-trivial situations.</td></tr>
<tr><td>Test procedure</td><td>Purpose of test:
To verify that all unique services are installed during channel search when the content of the transport streams are different on several transmitters. Also verify that all unique services are installed.

Equipment:
 

<table>
<tr><td>Channel X
TS Source #1
ONID= 8770
Network ID = 1000
Network Name= T_Net1
TSID=101

Channel list id= 1
Channel list name= Reg1

Services
<table>
<tr><th>Name</th><th>SID</th><th>Logic Ch No</th></tr>
<tr><td>S1</td><td>1</td><td>1</td></tr>
<tr><td>S2</td><td>2</td><td>2</td></tr>
<tr><td>S3</td><td>3</td><td>3</td></tr>
<tr><td>S4</td><td>4</td><td>4</td></tr>
</table></td><td>Channel Y
TS Source #2
ONID= 8770
Network ID =2000
Network Name= T_Net2
TSID=102

Channel list id= 1
Channel list name= Reg1

Services
<table>
<tr><th>Name</th><th>SID</th><th>Logic Ch No</th></tr>
<tr><td>S1</td><td>1</td><td>1</td></tr>
<tr><td>S5</td><td>5</td><td>2</td></tr>
<tr><td>S6</td><td>6</td><td>6</td></tr>
</table></td></tr>
</table>

Note that a unique servive within the Norwegian DTT network is defined by</td></tr>
</table>

Original_network_id and *service_id.*

Channels X and Y shall not be equal.

Test procedure:
This test procedure tests combination of the signal level and reception quality.

1. Configure transport streams and setup the instruments. Use DVB-T mode 8k 64QAM R=2/3 Δ/Tu=1/8.
2. Set the signal level of the carrier CH X to a signal level which is about 5dB higher than the signal level of the carrier CH Y. Both signal levels shall correspond to good reception quality (no errors in decoded video).
3. Add noise on carrier CH X to a level corresponding to 15s error free video is fulfilled.
4. Check that the channel list is empty. If it is not empty, delete all services.
5. Perform a channel search.
6. Select region T_Net1 or T_Net2 (both regions shall be tested).
7. Verify that the service list is like the table below.

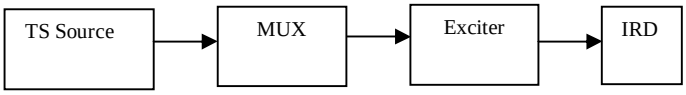
After performing the test the ALL SERVICE LIST shall be as below:

T_Net1	**Position**	**Service**	**Channel**
	1	S1	Y
	2	S2	X
	3	S3	X
	4	S4	X
	6	S6	Y
	7	S5	Y

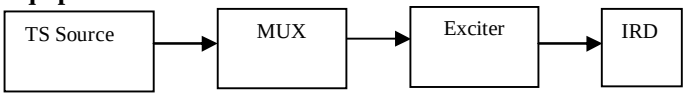
T_Net2	**Position**	**Service**	**Channel**
	1	S1	Y
	2	S5	Y
	3	S3	X
	4	S4	X
	6	S6	Y
	7	S2	X

Expected result:
That the service lists is according to the table above.

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	***Task 10:2 Service lists – DVB-SI signalisation***
Section	Ch 10 Riks TV Basic IRD Specifications DTT Norway
Requirement	3. A service shall not be listed in any service list if it cannot be received during scanning. The service shall be listed if it can be received from another region than the one selected by the user 4. The following apply if a signalled transport stream cannot be received: a. It shall not be included when NIT updates are done b. Its transport stream Id shall be stored to evaluate if new TS has been added as part of the new mux recognition function, see chapter 11.2 [16]
Test procedure	**Purpose of test:** Verify that the services that are signaled in DVB-SI but can not be received are not installed in any service list **Equipment:**  Transport stream from Norwegian DTT network containing NIT_actual with service_list_descriptor, SDT actual and SDT other. **Test procedure:** This test can be done in parallel with Task 10:7 Service lists – all services list general requirements 1. Perform a channel search 2. Verify that only the services defined in NIT_actual is installed. Quasi-static update of services belonging to a TS_id is tested in task 11:2 **Expected result:** services that are signaled in DVB-SI but can not be received are not installed in any service list
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	***Task 10:3 Service lists – general requirements***		
Section	Ch10 Riks TV Basic IRD Specifications DTT Norway		
Requirement	The IRD shall at least support the following service lists: 1. All services list 2. User defined list (at least one)		
Test procedure	**Purpose of test:** **Equipment:** **Test procedure:** This is a general requirement and will be tested in following test tasks. **Expected result:**		
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***	

<table>
<tr><td>Test Case</td><td>Task 10:4 Service lists – service types</td></tr>
<tr><td>Section</td><td>Ch10 Riks TV Basic IRD Specifications DTT Norway</td></tr>
<tr><td>Requirement</td><td>The IRD shall be able to separate the services based on service types, i.e. TV and Radio services. It is recommended to store radio services in a separate list.
The IRD shall only place services of service_type radio and TV in the service lists.</td></tr>
<tr><td>Test procedure</td><td>Purpose of test:
To verify how the IRD builds the service list when different service types are received.
Equipment:
 

<table>
<tr><th></th><th>Service1</th><th>Service2</th><th>Service3</th><th>Frequency</th></tr>
<tr><td>MUX
TS_id 1
Network_id 1
ON_id [1)]</td><td>SID 1100
Service type 0x01
S_name Test11
PMT PID 1100
V PID 1109
A PID 1108
Logical_chan_desc 1
visible
Encrypted</td><td>SID 1200
Service type 0x02
S_name Test12
PMT PID 1200
V PID 1209
A PID 1208
Logical_chan_desc 2
visible
Clear</td><td>SID 1300
Service type 0x0C
S_name Test13
PMT PID 1300
V PID 1309
A PID 1308
Logical_chan_desc 3
visible
Clear</td><td>Can be chosen depending of the distribution media</td></tr>
</table>
[1)] ON_id (Original_network_id) can be chosen in range 0x2242 (operational network)

Test procedure:
1. Verify that the services on MUX have service types digital television service and digital radio service signalled.
2. Perform re-initialisation if needed.
3. Check the service lists.

Expected result:
Different types of services are available on different category (section) lists or they are separated in one list to different categories (sections).

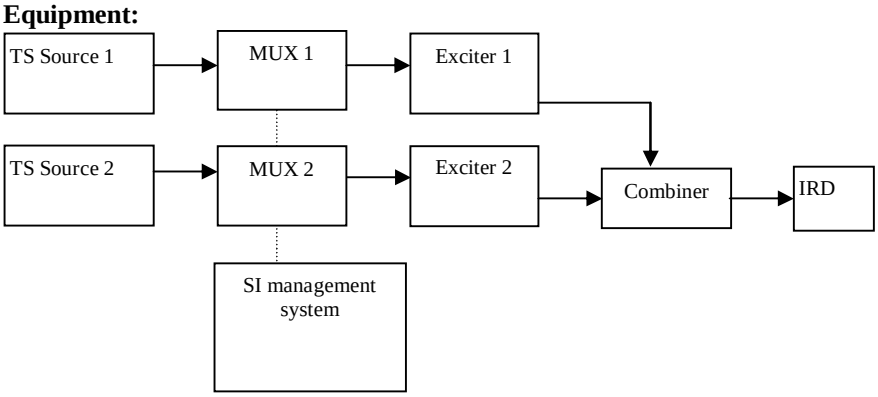
Categories are ‘TV’, ‘Radio’.

Service 3 is data service and therefore shall not be listed in the service list according to RiksTV specification. Data services intended for MHP IRDs shall be visible only for IRDs which supports MHP.</td></tr>
<tr><td>Test result(s)</td><td></td></tr>
<tr><td>Conformity</td><td>☐ OK Fault ☐ Major ☐ Minor, define fail reason in comments</td></tr>
<tr><td>Comments</td><td>If possible describe if fault can be fixed with software update: ☐ YES ☐ NO
Describe more specific faults and/or other information</td></tr>
<tr><td>Date</td><td></td><td>Sign</td><td></td></tr>
</table>

Test Case	***Task 10:5 Service lists – service list access and selection***		
Section	Ch10 Riks TV Basic IRD Specifications DTT Norway		
Requirement	The last used service list shall be presented when pressing OK or another dedicated button, e.g. “Ch. List” button on the remote RCU. It shall be easy to activate another list whenever a service list is displayed.		
Test procedure	**Purpose of test:** To verify how the service list can be accessed. **Equipment:** IRD under test. **Test procedure:** 1. Initially already installed services in all service list and NIT controlled operator list.. 2. Verify it is possible to access last selected service list by pressing the OK or another dedicated button button on the remote control 3. Verify it is possible to switch between service lists **Expected result:** Last selected service list shall be accessed by pressing OK or another dedicated button on the remote control. It is possible to select an other service list		
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	***Task 10:6 Service lists – non-visible services***		
Section	Ch10 Riks TV Basic IRD Specifications DTT Norway		
Requirement	The Operator shall be able to have test services in the network that will be receivable by the IRD but shall be hidden in the service lists. Such services will be signalled as hidden with the *visible_service_flag* in LCN.		
Test procedure	**Purpose of test:** To verify that non-visible service are not in the service list. **Equipment:** **Test procedure:** This test is requirement for the logical_channel_descriptor and is tested in * Task 10:7 Service lists – all services list general requirements **Expected result:**		
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	***Task 10:7 Service lists – all services list general requirements***
Section	Ch10.1 Riks TV Basic IRD Specifications DTT Norway
Requirement	The All Services list shall contain the complete range of services found independent of networks (favourite regional network, other regional networks and other original networks).
Test procedure	**Purpose of test:** To verify all services list is build up according to requirement. **Equipment:**



	Service1	**Service2**		**Frequency**
MUX1 TS_id 1 Network_id 1 Name Mux1 ON_id [1)]	SID 1100 S_name Test11 PMT PID 1100 V PID 1109 A PID 1108 Logical_chan_desc 1 visible	SID 1200 S_name Test12 PMT PID 1200 V PID 1209 A PID 1208 Logical_chan_desc 2 visible		Can be chosen depending of the distribution media.
MUX2 TS_id 2 Network_id 2 Name Mux2 ON_id [1)]	SID 2100 S_name Test21 PMT PID 2100 V PID 2109 A PID 2108 Logical_chan_desc 3 visible	SID 2200 S_name Test22 PMT PID 2200 V PID 2209 A PID 2208 Logical_chan_desc 4 non-visible		Can be chosen depending of the distribution media. Not same as for Exciter 1

[1)] ON_id (Original_network_id) is 0x2242 (operational network)

Logical_channel_desc is version 2.

Following tables are signaled in both MUX:

- SDT_actual and
- SDT_other
- NIT_acutal inclusive service_list

With following information content:

- In MUX1, the SDT_actual corresponds the SDT_other in MUX2.
- In MUX2, the SDT_actual corresponds the SDT_other in MUX1

With other words, the SDT information is cross-distributed between multiplexes.

Test procedure:

1. Attenuate the output level of the exciter 1 to very low level or disconnect the output cable.
2. Do first time initialization of the IRD.
3. Perform new channel search.

4. Verify that no services are installed carried within the transport stream through MUX1.
5. Fill in the measurement record in test results.
6. Increase the output level of the exciter1 to a output level that is able to be received by the receiver.
7. Clear all channels on service list (channel list in receiver).
8. Perform new channel search.
9. IRD should ask the end-user to select which favourite network see test task 10.7 in this test specification
10. Verify that all the services carried within transport stream from both MUX1 and MUX2 are installed in the service list.
11. Fill in the measurement record in test results.

Expected result:
All results in the measurement record shall be OK.

Test result(s)

Measurement record:

Requirement	**OK or NOK**
The All Services list is a complete list for services available from all receivable networks.	
The All Services list shall contain the complete range of services found independent of networks (favourite regional network, other regional networks and other original networks).	

Conformity

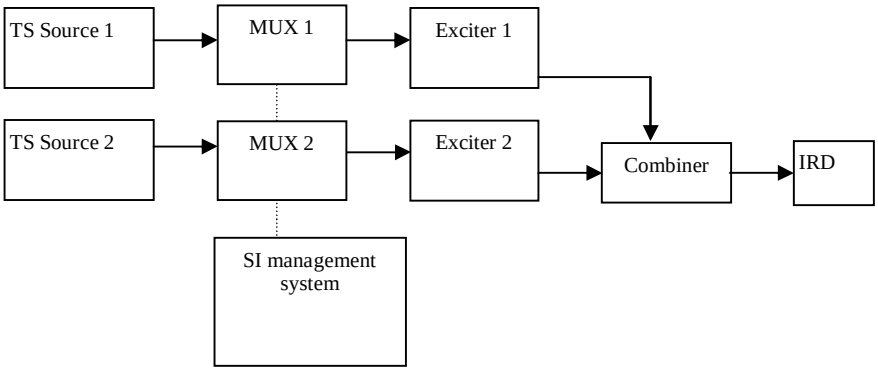
☐ **OK** **Fault** ☐ Major ☐ Minor, define fail reason in comments

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	***Task 10:8 Service lists – all services list numbering requirements***
Section	Ch10.1 and 10.3 Riks TV Basic IRD Specifications DTT Norway
Requirement	The All Service list shall be built up (numbered and ordered) in a hierarchical sequence based both on the network (NIT) the services belong to and the predefined order these services have within its network. Services of the same type (TV or Radio) shall be kept together in the case that the same list contains services in both categories. This requirement shall have higher priority than the numbering principle below. Special services shall be placed at the end of the list even when there are both TV and Radio services in the list. The services shall by default be numbered and ordered according to following principle: 1. All services within the same NIT_actual shall be kept together but the different NIT_actuals shall be given the following priority in the list: a. First priority: Favourite network, Original network ID 0x2242. b. Second priority: Other available networks (with the same ONID as above). c. Third priority: All other networks with different ONID. 2. All services shall be numbered and sorted according to the relevant LCN signalisation, meaning: a. The LCN transmitted on the favourite NIT will normally be the only one that has an absolute match between *logical_channel_number* and list position within the all list. b. For the other NIT_actual the available LCN will only be the priority sort order within their section in the all list. c. Services from networks with ONID = 0x2242 and LCN number in the range 900-999 shall be placed at the end of the list, if possible numbered according to LCN. Observe: All services are here defined by all unique receivable services and not several instances of the same service, meaning a services shall only be listed once. See Chapter 9 in Basic IRD Specifications DTT Norway for details. The end user shall not be able to change the All Services list. The list shall be fully updated according to the LCN when a new scan or auto-update is performed.
Test procedure	**Purpose of test:** To verify all services list is build up according to requirement. **Equipment:**



	Service1	**Service2**	**Service 3**	**Frequency**
MUX1 TS_id 1 Network_id 1 Name Mux1 ON_id [1)]	SID 1100 S_name Test11 Digital TV service PMT PID 1100 V PID 1109 A PID 1108 Logical_chan_desc 1 visible	SID 1200 S_name Test12 Digital TV service PMT PID 1200 V PID 1209 A PID 1208 Logical_chan_desc 2 visible	SID 1300 S_name Test13 Digital TV service PMT PID 1300 V PID 1309 A PID 1308 Logical_chan_desc 900 visible	Can be chosen depending of the distribution media.
MUX2 TS_id 2 Network_id 2 Name Mux2 ON_id [1)]	SID 2100 S_name Test21 Digital TV service PMT PID 2100 V PID 2109 A PID 2108 Logical_chan_desc 1 visible	SID 2200 S_name Test22 Digital TV service PMT PID 2200 V PID 2209 A PID 2208 Logical_chan_desc 2 visible		Can be chosen depending of the distribution media. Not same as for Exciter 1

[1)] ON_id (Original_network_id) is 0x2242 (operational network)

Logical_channel_desc is version 2.

Following tables are signaled in both MUX:

- SDT_actual and
- SDT_other
- NIT_acutal inclusive service_list

With following information content:

- In MUX1, the SDT_actual corresponds the SDT_other in MUX2.
- In MUX2, the SDT_actual corresponds the SDT_other in MUX1

With other words, the SDT information is cross-distributed between multiplexes.

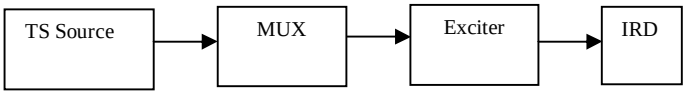
When several NIT_actuals (TS_id and ON_id=0x2242) are received, one of them is chosen to be a favourite network. Selection is done by the end-user. The favourite network has a priority and LCN is implemented for that network. All other received NIT_actuals (TS_id) has lower priority.

Test procedure:

1. Setup the system
2. Select MUX1 as favourite network during the scanning.
3. Verify the all services list is according to table in the expected results.
4. Verify the P- button zap from channel 1 to channel 900.
5. Verify the P+ button zap from channel 900 to channel 1.
6. Change the ONID of the MUX2 to 0x22F1.
7. Do the first time initialization.
8. Verify the all services list is according to table in the expected results.

Expected result:

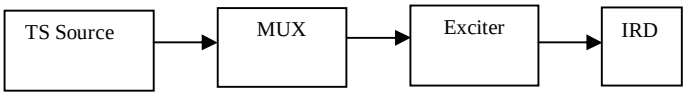
	Service list service order shall be following in test point 3: 1 Test11 2 Test12 3 Test21 4 Test22 900 Test13 Service list service order shall be following in test point 8: 1 Test11 2 Test12 3 Test21 4 Test22 900 Test13 Duplicate service instances in all services list is not tested here but in chapter 11. See Task 10:1 Channel search - Best service selection The user is not able to change the all services list. It is possible to wrap channels i.e. channel 1 to 900 and vice versa.
Test result(s)	Measurement record:
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	***Task 10:9 Service lists – user defined lists requirements***
Section	Ch10.2 Riks TV Basic IRD Specifications DTT Norway
Requirement	These are lists where the user can sort and select any service according to their own preferences. The user shall at least be able to do the following: a. Add and remove services from list. b. Change service ordering. The numbering of the services shall be updated to match the position when services are moved within the lists. The service shall be accessible by pressing the number corresponding to the position of the service in the list on the RCU. By consequence, the same unique service can have different numbering and positions in different lists. Only parameters from DVB-SI needed to receive the services shall be updated during a new scan or auto-update. Any parameter edited by the user such as service name and ordering shall be left unchanged.
Test procedure	**Purpose of test:** To verify the receiver supports user defined lists (favourite lists). These requirements are mandatory for all receiver types. **Equipment:**  **Test procedure:** 1. Verify it is possible to create user defined lists (favourite lists). 2. Verify it is possible to add and remove services from the favourite list 3. Verify it is possible to change service ordering in the favourite list 4. Verify the service numbering is updated according to user selection. The changed service number is able to be selected using RCU. 5. Verify it is possible to reset the ordering of the services by choise in the menu system. **Expected result:** That it is possible to create a user defined service list where it is possible to add and delete services, edit service list name , edit the order of the services. If the IRD is idTV, when new services are detected the end-user is prompted if he/she wants to proceed with the present order of services or to use ordering according to LCN. If the IRD is idTV, the ordering of the services in the all service list can be resetted by a choise in the menu 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	***Task 10:10 Service numbering and list ordering according to LCN v2***
Section	Ch10.3 Riks TV Basic IRD Specifications DTT Norway
Requirement	
Test procedure	**Purpose of test:** **Equipment:** **Test procedure:** These requirements are tested in test tasks above. **Expected result:**
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	***Task 10:11 Additions to LCN v2 collisions handling***
Section	Ch10.3.1 Riks TV Basic IRD Specifications DTT Norway
Requirement	Collisions are defined as several services with the same *logic_channel_number* assigned in the same channel list in the same *logical_channel_descriptor*. This will typical be the case when a user is in an area where several local transport streams can be received. Collision shall be handled according to NorDig Unified specifications [2] with the following additional requirement: The IRD shall select which service to be placed according to the signalled *logic_channel_number* according to the following rules: • Visible services shall have higher priority than non-visible. • Service type TV (0x01, 0x16, and 0x19) shall have higher priority • Service with best reception (Strength and Quality) shall have higher priority and shall be numbered according to the LCN. The IRD shall use the Signal Strength Indicator (SSI) or Signal Quality Indicator (SQI) as defined by Nordig [2] when determining reception. The service(s) not given priority shall be treated as “non LCN defined services” as defined in chapter 10.3.2.

Test procedure	**Purpose of test:** To verify the IRD functionality in case of collision in LCN. **Equipment:** This test is the same as NorDig test specification [1] task 3:10 Tuning/Scanning Procedures: Automatic channel search for the same service bouequet with an addition that the NorDig Logical_channel_descriptor version 2. In that descriptor Channel_list_id = 1 and channel_list_name = test.  Transport stream containing a visible and a non-visible service with the same signaled LCN. The transport stream shall also include a TV service (0x16), a radio service and a data service with the same signalled LCN. **Test procedure:** 1. Verify that a visible service has higer priority than a non-visible 2. Verify that the TV service has priority over the radio and the data service **Expected result:** TV and Visible services are priorities. The compliance to NorDig test task reception quality is handled in NorDig test specification [1].		
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***	

<table>
<tr><td>Test Case</td><td>Task 10:12 Missing LCN v2 handling</td></tr>
<tr><td>Section</td><td>Ch10.3.2 Riks TV Basic IRD Specifications DTT Norway</td></tr>
<tr><td>Requirement</td><td>These are services available within the NIT_actual but not predefined by the LCN, here called “non LCN defined services”, i.e. both:

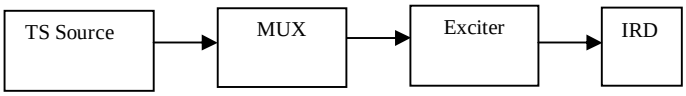
1. Services that are not defined in any LCN.

2. Services that are not defined within this unique service list (NIT actual), but defined by LCN for another list.

All services that are found during scanning and defined as “non LCN defined services” shall be placed after the last LCN service in this defined list.

For the “All Services list”, the IRD shall keep services within the same NIT together and service type even if no order is defined.</td></tr>
<tr><td>Test procedure</td><td>Purpose of test:
Verify the IRD service list functionality in case of missing LCN.

Equipment:

<table>
<tr><td></td><td>Service1</td><td>Service2</td><td>Service3</td><td></td></tr>
<tr><td>MUX
TS_id 1
Network_id 1
ON_id [1)]</td><td>SID 1100
Service type 0x16
S_name Test11
PMT PID 1100
V PID 1109
A PID 1108
Logical_chan_desc 1
visible
Clear</td><td>SID 1200
Service type 0x16
S_name Test12
PMT PID 1200
V PID 1209
A PID 1208
Logical_chan_desc
not defined
Clear</td><td>SID 1300
Service type 0x16
S_name Test13
PMT PID 1300
V PID 1309
A PID 1308
Logical_chan_desc
10 visible
Clear</td><td></td></tr>
<tr><td></td><td>Service4</td><td>Service5</td><td></td><td></td></tr>
<tr><td></td><td>SID 1400
Service type 0x0A
S_name Test14
PMT PID 1400
V PID 1409
A PID 1408
Logical_chan_desc 3
visible
Clear</td><td>SID 1500
Service type 0x0A
S_name Test15
PMT PID 1500
V PID 1509
A PID 1508
Logical_chan_desc
not defined
Clear</td><td></td><td></td></tr>
</table>
Idea in this test is that in the NIT_actual defines services (in service_descriptor) but not in logical_channel_descriptor.

Test procedure:

1. Setup the system
2. Perform scan
3. Verify the expected results.

Expected result:
Services without correct logical_channel_descriptor are stored last in the defined list (NIT controlled operator list).

Services without correct logical_channel_descriptor are stored together (within NIT_actual and service_type) (All services lists).</td></tr>
</table>

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***	

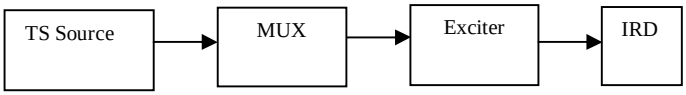
4.8 Task 11: Automatic updates

The automatic update procedures described in this section refer only to services signalled in NIT_actual with Original Network ID = 0x2242.

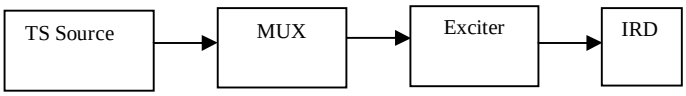
Changes in other networks shall not trigger the automatic update procedures. This is to avoid false updates because of possible variations in the DVB-SI signalling used in other networks and accordingly disturbance of the users viewing experience.

- ➔ Static PSI/SI data is defined as a data that must be updated by the receiver in the channel search or first time initialization.
- ➔ Quasi static PSI/SI data is defined as a data that must be updated by the receiver when it is toggled between stand-by mode and active mode or vice versa.
- ➔ Dynamic PSI/SI data is defined as a data that must be updated by the receiver whenever a change in the data occurs.

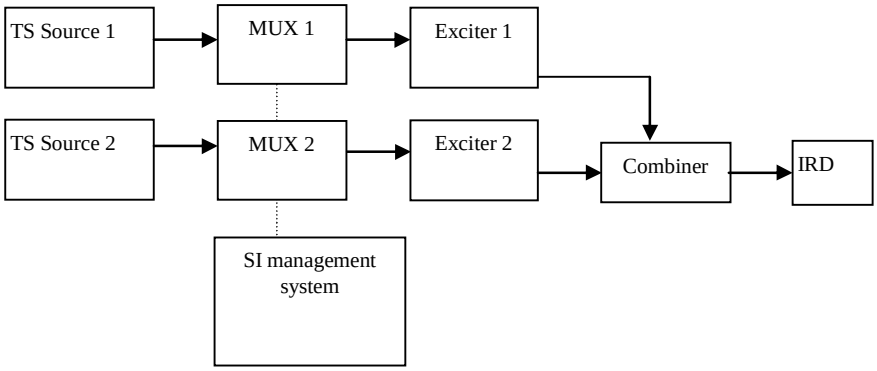
Test Case	***Task 11:1 Quasi-static update of service list from NIT_actual for already existing multiplexers***
Section	Ch11.1 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall be able to update services and service-lists dynamically (dynamic is here understand as quasi-static, see later in this requirement) without a rescan procedure initiated by the end-user. This functionality shall be limited to the actual NIT, i.e. the IRD shall fully rely on the DVB-SI in the actual transport stream as defined below. The IRD shall check if a new NIT version is available, if the NIT version has changed the IRD shall: …(see specification). NIT versions shall be checked at least when the IRD is powered up or goes from stand-by. The update should, if possible, be performed without disturbing the end-usability. If not, the IRD shall act as follows: …(see specification). The IRD shall only perform service updates based on existing descriptors, i.e. if a service list descriptor exists in the examined loop and a service has been removed/added, the IRD shall update the service list accordingly. If the loop or the descriptor for any reason is not available, the IRD shall take no action. This means that if a whole transport stream is added or removed, the IRD will only recognise this from a new scan. It is recommended that the update is done continuously in the background. Observe that background updates shall be done without disturbing the end user.

Test procedure	**Purpose of test:** To verify that the IRD is able to update the service list automatically by doing it quasi-static. **Equipment:**  NOTE: Assumption in the transport stream NIT_actual is that it has the TS_id signaled for the multiplexer where the changes occur. **Test procedure:** 1. Set up the system and verify the transport stream contains a NIT_actual with original_network_id=0x2242 and TS_id=0x1 2. Verify which services IRD has in its service list. 3. Switch off the IRD. 4. Change following items in the NIT_actual one by one: a. Rename content of the network_name_descriptor b. Change logical number of the logical_channel_descriptor c. Add and remove service in service_list_descriptor including the logical channel number. 5. Verify the change of the NIT_actual and update of the version number of the NIT. 6. Turn on IRD. 7. Verify how (turn on or switch off) the receiver updates the changed data in the service list. 8. Verify that the changed information corresponds the changed information content. **Expected result:** Service list is updated quasi-statically according to content in the NIT_actual. The update process should not disturb end-usability, or it shall inform end-user that update process occurs in case of disturbancies will occur.
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	***Task 11:2 Quasi-static update of service list from NIT_actual for non-existing multiplexers***
Section	Ch11.2 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall automatically perform a new scan when a new mux has been added in the network. This shall be triggered when the IRD detects that a new NIT version is available where the second loop of the new NIT contains a TS_id that has not been previously stored in the IRD. In this case the following actions shall be performed:

Test procedure	**Purpose of test:** To verify that the IRD is able to update the service list automatically by doing it quasi-static. **Equipment:**  NOTE: Assumption in the transport stream NIT_actual is that it has not the TS_id signaled for the added/removed multiplexer. **Test procedure:** 1. Set up the system and verify the transport stream contains a NIT_actual with original_network_id=0x2242 and TS_id=0x1. 2. Do a reinstallation of the IRD 3. Verify which services IRD has in its service list (and a service from following steps is not stored in the service list.) 4. Turn off the IRD 5. Add new TS_id in the NIT_actual including a service_list_descriptor and logical_channel_descriptor for one service. 6. Turn on IRD. 7. Verify how (turn on or switch off) the IRD updates the changed data in the service list. 8. Verify the IRD displays an information message to end-user stating a new scan is required. 9. Verify the IRD starts scanning. 10. Verify it is able to cancel the scanning. **Expected result:** IRD shall update the service list by doing a scan in case of the service is in a non-existing multiplex (not scanned before). The scanning process can be canceled.
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***

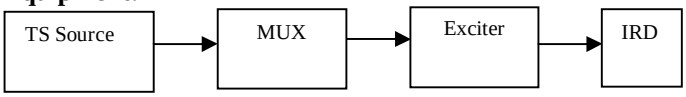
Test Case	***Task 11:3 Quasi-static update of service list from NIT_actual for frequency changes***
Section	Ch11.3 Riks TV Basic IRD Specifications DTT Norway
Requirement	If a new NIT version is detected, the frequency list descriptor for all transport streams shall be checked. If there are changes to frequencies used by a transport stream compared with the previously received NIT version, the following actions shall be taken: Tune to all frequencies in the new NIT frequency list descriptor for the transport streams with changes and choose the frequency with best reception. Use this as preferred frequency when tuning into the given transport stream.

Test procedure	**Purpose of test:** To verify that the IRD is able to update the service list automatically by doing it quasi-static in change of the frequency in the frequency_list_descriptor. **Equipment:**  Idea of the test is that the IRD selects frequency (exciter) with best reception after the change of frequency in frequency_list_descriptor. NOTE: Assumption in the transport stream NIT_actual is that it has the TS_id signaled for the multiplexers where the changes occur. In the 2nd loop of the NIT_actual, a frequency_list_descriptor is signaled. **Test procedure:** 1. Set up the system and verify the transport streams contain NIT_actuals with original_network_id=0x2242 and TS_id=0x1 2. Verify from which frequency (exciter) the services IRD has installed in its service list. 3. Change the reception conditions from the exciter to a certain condition that reception errors occur. This can be done e.g. by changing the RF output level of the exciter. 4. Switch off the IRD. 5. Change frequency in the NIT_actual frequency_list_descriptor. 6. Change the other exciter frequency to correspond the change of the frequency in the frequency_list_descriptor. 7. Verify the change of the NIT_actual and update of the version number of the NIT. 8. Turn on IRD. 9. Verify how (turn on or switch off) the receiver updates the changed data in the service list. 10. Verify that IRD has selected services from that frequency which was set in step 5 and 6. 11. Add a new frequency in the frequency_list_descriptor which does not correspond any of the exciter frequencies. 12. Perform quasi-static update of the receiver. 13. Verify the receiver does not start to scan. **Expected result:** IRD updates quasi-statically the changes in the frequency_list_descriptor. When the frequency does not have any DVB-T signal to receive, but the frequency is signaled in frequency_list_descriptor, the IRD shall perform a scan. NOTE: Due to that the missing frequency_list_descriptor shall not cause any action in the IRD, it is not tested.
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	***Task 11:4 Loss of signal***
Section	Ch11.4 Riks TV Basic IRD Specifications DTT Norway
Requirement	If for some reason the IRD cannot tune to a transport stream or the IRD looses signal when tuned to a service, the IRD shall display a message to the end user that explains that the service cannot be received due to loss of signal.
Test procedure	**Purpose of test:** To verify that the IRD is displaying a message to the end user that explains that the service cannot be received due to loss of signal. **Equipment:** **Test procedure:** 1. Set up the system and verify the transport stream contains NIT_actual with original_network_id=0x2242 and TS_id=0x1 2. Attenuate the RF output level of that exciter to such a level that it is not anymore able to be received. 3. Verify the receiver displays a message to end-user that the signal loss has appeared. **Expected result:** IRD displays signal loss message to end-user when the alternative signal cannot be found.
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	***Task 11:5 Dynamic update of PSI/SI***
Section	Ch11.5 Riks TV Basic IRD Specifications DTT Norway
Requirement	The PSI/SI parameters as defined in NorDig Unified [2] as dynamical data shall be updated within 1s, observe that the service descriptor (service name) for the actual SDT is within DTT Norway also defined as dynamical data

Test procedure	**Purpose of test:** To verify that the IRD is able to update the PSI/SI parameters within 1s including service_name in SDT_actual. **Equipment:**  **Test procedure:** See NorDig Unified Test specification Dynamic PSI/SI tasks in chapter 2.9.4: Change of the service_name in SDT_actual: 1. Change the information in SDT; a. service_name 2. Check that the changes are interpreted dynamically. **Expected result:** Conformity to NorDig test specification tasks are handled in NorDig test specification [1]. IRD updates the service_name dynamically.
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***

4.9 Task 12: Signal meter

Test Case	***Task 12:1 Signal meter***
Section	Ch12 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall be able to provide reception quality information for a selected received frequency according to specifications for basic and advanced status check as specified by Nordig Unified Specification [2]. This includes the Nordig requirements for the signal strength indicator (SSI) and the signal quality indicator (SQI). The measured frequency (channel) shall be possible to alter within this menu. It shall not be necessary to perform any channel search before using the meter. The meter shall be available through the IRDs menu system after successful installation.
Test procedure	**Purpose of test:** To verify that the IRD is able to provide reception quality information for a selected received frequency. (See NorDig Unified Test Specification [1] Task 3.9) **Equipment:** IRD Under test **Test procedure:** Follow NorDig Unified Test Specification [1] Task 3.9 **Expected result:**

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***	

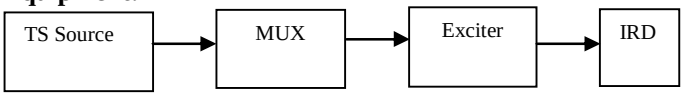
4.10 Task 13: System Software Update

Test Case	***Task 13:1 Over-the-air upgrade – general requirements***		
Section	Ch13 Riks TV Basic IRD Specifications DTT Norway		
Requirement	The Norwegian DTT network offers System Software Update based on ETSI 102 006 [5]. All receivers shall support the SSU simple and enhanced profile as specified in NorDig Unified specification [2]. The IRD shall if possible avoid re-installation and service scanning after an update. All user preferences, user defined lists etc. should if possible remain unchanged. Manufacturers shall provide appropriate recovery measures to cope with possible receiver failure or hang-up during the SSU update.		
Test procedure	**Purpose of test:** To verify that the IRD is able to be upgraded through over-the-air. **Equipment:** **Test procedure:** These are the general requirements of the over-the-air download mechanism and they are tested in RiksTV SSU Test specification for IRD [17] **Expected result:**		
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	***Task 13:2 Over-the-air upgrade – Conax CA security requirements***
Section	Ch13 Riks TV Basic IRD Specifications DTT Norway
Requirement	The SSU mechanism shall comply with Conax security requirements related to software integrity for IRDs with embedded Conax CA.

Test procedure	**Purpose of test:** **Equipment:** **Test procedure:** This test is covered by the Conax certification. **Expected result:**		
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***	

4.11 Task 14: Enabling/Disabling HDCP

Test Case	***Task 14:1 HDCP functionality***
Section	Ch14.1 and 14.2 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall support control of HDCP. The Norwegian DTT network uses a private copy control descriptor to signal the "level" of copy control permissions per service. The IRD shall comply with the Nordig specifications for content protection [18]. The following rules/clarifications apply for the Norwegian DTT network: a) Content protection information is currently carried in PMT. The signalling complies with Nordig HDTV section 12.7.3. b) The IRD shall provide an option for setting the preferred HDCP-state (HDCP user setting). c) Factory default for the HDCP user setting shall be "ON"
Test procedure	**Purpose of test:** To verify that the receiver is able set the status HDCP according the signal protection scheme. **Equipment:**  The TS shall contain services with HDCP and without HDCP. **Test procedure:** 1. Setup the equipment 2. Set the content protection mode to one by one each mode in table below 3. Fill in test results **Expected result:** The IRD supports copy_control_descriptor. The IRD shall provide an option for setting the preferred HDCP-state (HDCP user setting).

The check-box selection is a global selection affecting to all services.

Factory default for the HDCP user setting shall be “ON”.

		Expected behaviour		Observed behaviour	
Channel	Explanation	HDCP OFF	HDCP ON	HDCP OFF	HDCP ON
LEV_0_SD	SD service with HDCP level 0 signalled in PMT.	Video and Audio displayed without delay.	Video and Audio displayed without delay.		
LEV_1_SD	SD service with HDCP level 1 signalled in PMT.	Video and Audio displayed without delay.	Video and Audio displayed without delay.		
LEV_2_SD	SD service with HDCP level 2 signalled in PMT.	Video and Audio displayed without delay.	Video and Audio displayed without delay.		
LEV_3_SD	SD service with HDCP level 3 signalled in PMT.	Video and Audio not displayed. Message displayed to customer telling him to turn ON HDCP in order to view this channel.	Video and Audio displayed without delay.		
LEV_2_HD	HD service with HDCP level 2 signalled in PMT.	Video and Audio not displayed. Message displayed to customer telling him to turn ON HDCP in order to view this channel.	Video and Audio displayed without delay.		

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***	

4.12 Task 15: Parental Control

Test Case	***Task 15:1 Dynamic update of EIT actual/other p/f parental_rating_descriptor***
Section	Ch15.1 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall interpret the ”parental_rating_descriptor” in EIT and compare the signalled limit with the user setting for parental control: The user shall be able to select between the following limits as a minimum, which corresponds to the limits used by the Norwegian Media Authority.

Limit (years)	**English text**	**Norwegian text**
No limit	See everything (no content is blocked)	Se alt (ingenting er sperret)
7	7 years (The content may	7 år (Programmet kan

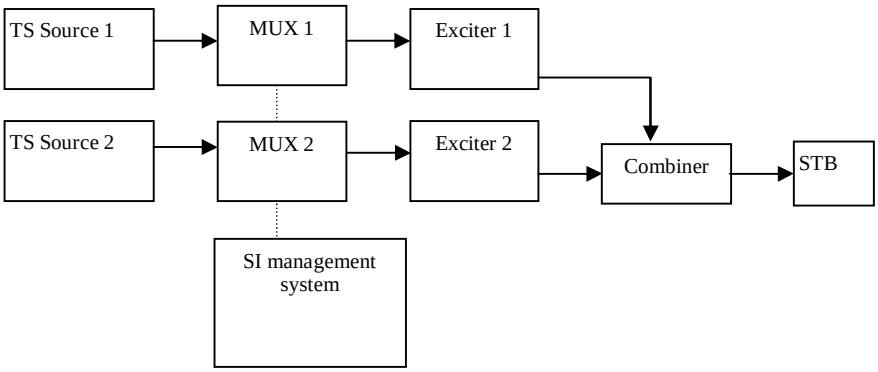
	be harmful to children younger than 7 years)	være skedelig for barn under 7 år)
11	11 years (The content may be harmful to children younger than 11 years)	11 år (Programmet kan være skedelig for barn under 11 år)
15	15 years (The content may be harmful to children younger than 15 years)	15 år (Programmet kan være skedelig for barn under 15 år)
18	Adult (The content may be harmful to children younger than 18 years)	Voksne (Programmet kan være skedelig for barn under 18 år)

The EIT parental control shall be checked every time the IRD tunes to a new service and when a new event starts. The IRD shall prompt the user for a PIN code if the limit set in the menu is lower than what is signalled in the EIT.

Test procedure

Purpose of test:
To verify the functionality of parental rating from EIT signaling.

Equipment:



	Service1	**Service2**		**Frequency**
MUX1 TS_id 1 Network_id 1 ON_id [1)]	SID 1100 S_name Test11 PMT PID 1100 V PID 1109 A PID 1108 Logical_chan_desc 1 visible	SID 1200 S_name Test12 PMT PID 1200 V PID 1209 A PID 1208 Logical_chan_desc 2 visible		Can be chosen depending of the distribution media.
MUX2 TS_id 2 Network_id 2 ON_id [1)]	SID 2100 S_name Test21 PMT PID 2100 V PID 2109 A PID 2108 Logical_chan_desc 3 visible		Bouquet SI All information in EIT.	Can be chosen depending of the distribution media. Not same as for Exciter 1

[1)] ON_id (Original_network_id) can be chosen in range 0x0001-0xfe00 (operational network)

Test procedure:

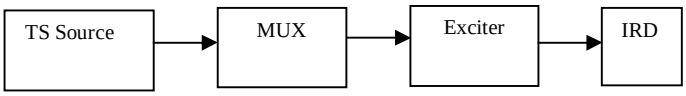
4. Control that there is a service with EIT information signalled for higher parental_rating as allowed in preferences of the IRD on MUX1
5. Zap to this service
6. Verify the IRD prompts PIN code.

Expected result:

The IRD shall prompt PIN code if the limit set in the menu is lower than what is signaled in the EIT.

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***	

4.13 Task 16: Content protection

Test Case	***Task 16:1 Embedded Conax***
Section	17 Riks TV Basic IRD Specifications DTT Norway
Requirement	The manufacturer shall implement Conax CA according to the NTV customer profile, which can be retrieved from Conax by Conax licensees. This profile mandates pairing of smartcards and receivers with chipset pairing. Embedded Conax is mandatory for STBs. It is not mandatory for an IDTV to have embedded Conax conditional access system. In the case that the IDTV does not have embedded conditional access system, it shall have an interface for Conditional Access modules (DVB-CI Plus) as specified in the NorDig Unified specification [2]
Test procedure	**Purpose of test:** Verify that STB has embedded Conax (DVB-CI Plus for IDTV) **Equipment:**  The TS shall contain a Conax encrypted service from Norwegian DTTV Network. A Conax SMC that is configured to the tested IRD and the transport stream. **Test procedure:** 1. Perform a channel search 2. Verify that the receiver is able to deocode and display the decoded services within the transport stream. **Expected result:** That the IRD is able to decode and display the service.
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	***Task 16:2 Support for Conax "Host data" and "User messages"***

Section	Ch 16.1 Riks TV Basic IRD Specifications DTT Norway		
Requirement	IRDs with embedded Conax shall support "Host data" and related "User messages" as defined in Chapter 8 of the Conax Conformity Requirements document.		
Test procedure	**Purpose of test:** **Equipment:** **Test procedure:** This test is covered by the Conax certification process. **Expected result:**		
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***	

4.14 Task 17: Subtitling & Teletext

Test Case	***Task 17:1 Subtitling & Teletext – NorDig requirements***
Section	Ch17 Riks TV Basic IRD Specifications DTT Norway
Requirement	Please see Nordig Unified [2] for specifications on subtitling and teletext. This specification includes some relaxations and clarifications compared with the DVB specifications. The IRD shall gracefully present Subtitling and Teletext in all supported resolutions for all HD interfaces. The IRD shall support HD DVB Subtitlis used with HDTV services according to [13] and decode and display such subtitles with correct size and aspect ratio.
Test procedure	**Purpose of test:** To verify that the IRD supports requirements in NorDig specification [2]. **Equipment:** **Test procedure:** See NorDig Unified Test specification [1] Tasks 9:1 to 9:12. **Expected result:** Conformity of the IRD is handled in NorDig test specification [1]
Test result(s)	
Conformity	☐ **OK** **Fault** ☐ Major ☐ Minor, define fail reason in comments

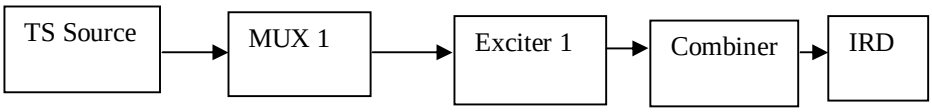
Comments	If possible describe if fault can be fixed with software update: ☐ **YES** ☐ **NO** Describe more specific faults and/or other information		
Date		***Sign***	

Test Case	***Task 17:2 Subtitles - Hard of Hearing***
Section	Ch17 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall include a user option for subtitles for the Hard of Hearing (HoH). Selection of subtitle to display shall follow the following table. The IRD shall select according to the table even though both "Normal" and/or HoH subtitles can be broadcasted as DVB or Teletext subtitles. This setting also has higher priority than the language selection for subtitles.

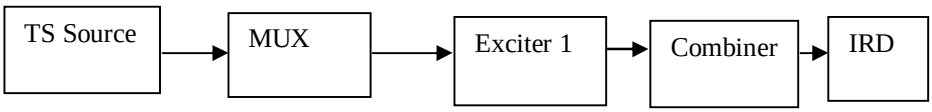
Hard of Hearing setting		**Broadcasted subtitles**		**Correct selection**
HoH disabled (default)	HoH enabled	Normal	HoH	
x				No subtitle displayed
x			x	No subtitle displayed
x		x		Normal
x		x	x	Normal
	x			No subtitle displayed
	x		x	HoH
	x	x		Normal
	x	x	x	HoH

Test procedure	**Purpose of test:** To verify the IRD selects subtitle to display according to the table above. **Equipment:** IRD under test **Test procedure:** **Expected result:** Correct subtitle types are selected according to the table above.
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***

4.15 Task 18: Program guides

Test Case	***Task 18:1 Support for HDTV service indication***
Section	Ch18 and 18.1 Riks TV Basic IRD Specifications DTT Norway
Requirement	All program guides shall be able to indicate if an event is in HDTV resolution as signaled in the *component_descriptor*. The EPG shall support the *Component_descriptor* by a symbol for at least aspect ratio, multichannel audio and definition such as SD and HD.
Test procedure	**Purpose of test:** To verify the IRD indicates a HDTV service existens and its resolution. **Equipment:**  The stream_content and component_type in component_descriptor are signaled in EIT. The service_type in service_descriptor in SDT can signalize if the SD or HD. The TS source shall contain HD service signaled as correct: • service_type in service_desc in SDT • stream_content and component_type in component_desc in EIT **Test procedure:** 1. Setup the system 2. Lauch the program guide 3. Verify the HD service are indicated in both EPG and ESG. **Expected result:** HD service is indicated.
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	***Task 18:2 Character set support***
Section	Ch18 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall support ISO/IEC8859-1 (Western European) and ISO/IEC 8859-4 (North and North-East European) for EIT. The encoding of character set is according to ETSI EN 300 468 [3]. The IRD shall be able to choose the correct character set as signalled per event in EIT.

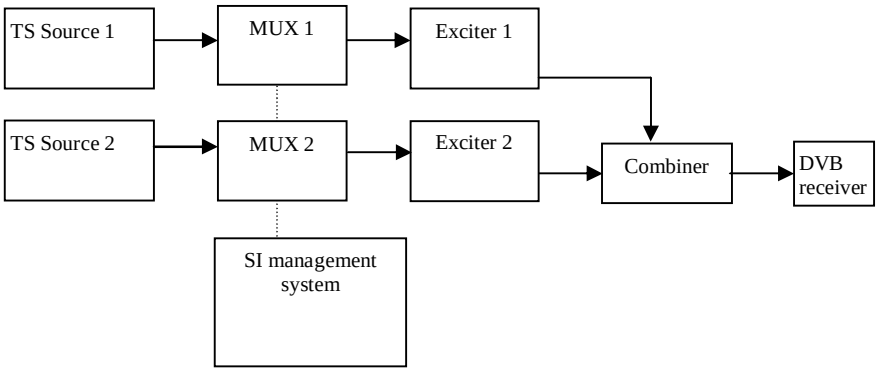
Test procedure	**Purpose of test:** To verify the IRD supported character sets per event in EIT. **Equipment:**  The TS source shall contain following bytes in EIT to indicated character set in use: • ISO/IEC8859 alphabet 1 (Western Europe) • ISO/IEC8859 alphabet 4 (North and North-East European) **Test procedure:** 1. Setup the system 2. Lauch the program guide 3. Verify the characters are displayed correctly. **Expected result:** Characters are displayed correctly per event in EIT.
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	***Task 18:3 EPG – general requirements***
Section	Ch18.1 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall implement a seven (preferably eight) days EPG based on EIT schedule. The EPG shall present services in accordance with the service list that is currently active.It shall be possible from the EPG to switch between available lists. It shall be possible to select a service for viewing from the EPG. The EPG shall initially display an overview of services listed with the service name, event_name, start- and stop-time (calculated from the duration). This first overview shall start the presentation based on the current time. It shall be possible to navigate between all the services and events. It shall be possible to get more detailed information about a selected event. The IRD shall provide audio from the tuned service when the EPG is in use.

Test procedure

Purpose of test:
To verify the EPG functionality.

Equipment:



	Service1	**Service2**		**Frequency**
MUX1 TS_id 1 Network_id 1 ON_id [1)]	SID 1100 S_name Test11 PMT PID 1100 V PID 1109 A PID 1108 Logical_chan_desc 1 visible	SID 1200 S_name Test12 PMT PID 1200 V PID 1209 A PID 1208 Logical_chan_desc 2 visible		Can be chosen depending of the distribution media.
MUX2 TS_id 2 Network_id 2 ON_id [1)]	SID 2100 S_name Test21 PMT PID 2100 V PID 2109 A PID 2108 Logical_chan_desc 3 visible		Bouquet SI All information in EIT.	Can be chosen depending of the distribution media. Not same as for Exciter 1

[1)] ON_id (Original_network_id) is 0x2242

MUX1 event information (EIT actual p/f and schedule) is cross-distributed to MUX2 as event information (EIT other p/f and schedule).

MUX2 event information (EIT actual p/f and schedule) is cross-distributed to MUX1 as event information (EIT other p/f and schedule).

Test procedure:

1. Setup the system.
2. Navigate in EPG.
3. Verify all the requirements in the test results and fill in the test results measurement record.

Expected result:

All the test results are OK.

Test result(s)	Measurement record: **Requirement** / **OK or NOK** When the EPG is launched, the presentation starts from the current time. / The presentation shows service name, event_name, start- and stop-time (calculated from the duration). / IRD has seven days EPG. / The currently activate service list defines which services are listed in EPG. / It is possible to switch between service lists. / It is possible to navigate between all services and events in currently active service list. / It is possible to get more detailed information about the selected service. / It is possible to select service in EPG for viewing. / IRD provides audio for the tuned service when EPG is in use /
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	***Task 18:4 EPG – NorDig requirements***
Section	Ch18.1 Riks TV Basic IRD Specifications DTT Norway
Requirement	The EPG shall at least support the: 1. Service name 2. *Short_event_descriptor* 3. *Content_descriptor* at least content_nibble_level_1 type The EPG shall support the *Component_descriptor* by a symbol for at least aspect ratio, multichannel audio and definition such as SD and HD.
Test procedure	**Purpose of test:** To verify the EPG functionality. **Equipment:** These requirements are the same as in NorDig Unified [2]. **Test procedure:** See NorDig test specification [1] task 8:44 Dynamic update of EIT actual/other p/f and scheduling in ESG using linkage and task 8:45 Dynamic update of EIT actual/other p/f and scheduling in ESG. **Expected result:** Conformity is handled in NorDig test specification [1].
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	***Task 18:5 Present-following guide (infobanner)***		
Section	Ch18.2 Riks TV Basic IRD Specifications DTT Norway		
Requirement	The IRD shall include a present & following guide for the currently selected service as an overlay of the video. It shall be possible to view the EIT p/f information for all services within the active service list without changing service. NOTE: For IDTVs there are two relaxations: • The all EIT p/f requirement is relaxed only to present the event name. • It is recommended, but not required that the Present-following guide can be used to display information for other service than the one selected..		
Test procedure	**Purpose of test:** To verify the Present-following guide functionality. **Equipment:** Present-following guide in this context means the info banner. **Test procedure:** Verify that event name from EIT p/f_actual and EIT p/f_other are displayed in the Present-following guide. **Expected result:** Present-following guide is an OSD. It is possible to view the EIT p/f information for all services within the active service list without zapping between services. If the IRD is IDTV, following is relaxed: • only event_name is shall be presented • it should be possible to view the EIT p/f information for all services within the active service list without zapping between services.		
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	***Task 18:6 Dynamic update of EIT actual/other p/f and schedule***
Section	Ch18.3 Riks TV Basic IRD Specifications DTT Norway

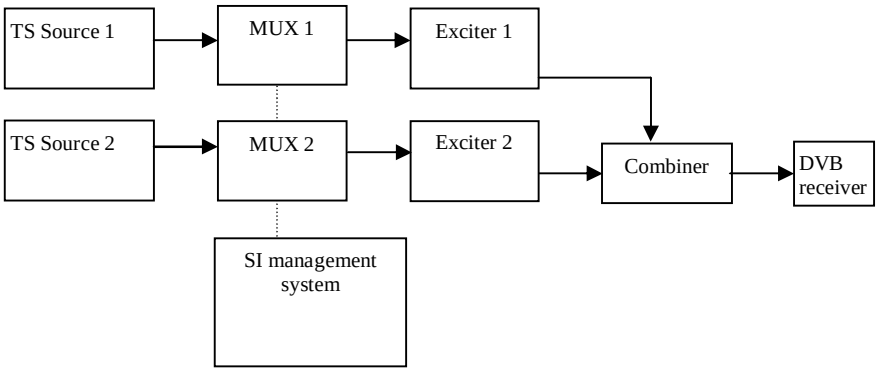
Requirement	The IRD shall support automatic collection and update of the EIT information and cache the information during operation, both for EIT present/following and EIT schedule data. The IRD shall reserve at least 5 MB memory for this purpose. This means that the IRD shall continuously monitor the available EIT tables in actual transport steams and update as new EIT versions are available. If a *linkage_descriptor* is present, the IRD shall follow this link when the EPG application is launched to update EPG and cache. This will give the end-user instant access to both the EPG and ESG information.
Test procedure	**Purpose of test:** To verify the dynamic update of the EIT information. **Equipment:** These requirements are the same as in NorDig Unified [2]. **Test procedure:** See NorDig test specification [1] test task 8:44 dynamic update of EIT actual/other p/f and schedule in ESG using linkage" is used. See NorDig test specification [1] test task 8:45 dynamic update of EIT actual/other p/f and schedule in ESG" is used (EIT is cross-distributed). EIT cache size is guaranteed by the IRD manufacture. **Expected result:** Conformity is handled in NorDig test specification [1]. EIT cache size is 5 Mbyte.
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	***Task 18:7 Dynamic update of EIT restrictions***
Section	Ch18.3.1 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD will not be able to retrieve information from other receivable networks as EIT is not distributed across networks. To minimize the consequences of this restriction the IRD shall start caching the EIT "immediately" when tuning to a transport stream within a different network. The cache process shall in case of memory shortage prioritise the Norwegian DTT. The IRD shall only cache *event_name* and *Short_event_descriptor* for networks that are not matching the *original_network_id* for Norway.

Test procedure

Purpose of test:
To verify the EIT data capturing restrictions functionality.

Equipment:



	Service1	**Service2**		**Frequency**
MUX1 TS_id 1 Network_id 1 ON_id [1)]	SID 1100 S_name Test11 PMT PID 1100 V PID 1109 A PID 1108 Logical_chan_desc 1 visible	SID 1200 S_name Test12 PMT PID 1200 V PID 1209 A PID 1208 Logical_chan_desc 2 visible		Can be chosen depending of the distribution media.
MUX2 TS_id 2 Network_id 2 ON_id [2)]	SID 2100 S_name Test21 PMT PID 2100 V PID 2109 A PID 2108 Logical_chan_desc 3 visible			Can be chosen depending of the distribution media. Not same as for Exciter 1

[1)] ON_id (Original_network_id) is 0x2242
[2)] ON_id (Original_network_id) is 0x22F1

MUX1 event information (EIT actual p/f and schedule) is cross-distributed to MUX2 as event information (EIT other p/f and schedule).

MUX2 event information (EIT actual p/f and schedule) is cross-distributed to MUX1 as event information (EIT other p/f and schedule).

Test procedure:

1. Setup the system.
2. Navigate in EPG and ESG.
3. Verify that from the mux1 EIT information is interpreted completely, but from the mux2 it is only interpreted event_name and the content of the short_event_descriptor.

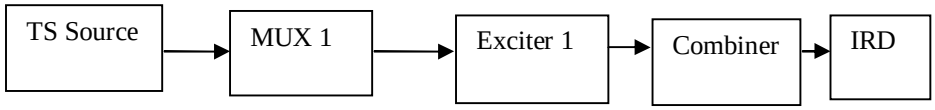
Expected result:

Only event_name and content of the short_event_descriptor are interpreted from the networks belonging to ON_id ≠ 0x2242.

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***	

4.16 Task 19: User Interface

Test Case	***Task 19:1 Support for Norwegian and English***
Section	Ch19 Riks TV Basic IRD Specifications DTT Norway
Requirement	All menus shall be available in at least Norwegian and English; it is recommended that all 4 Nordic languages (Finnish, Danish, Norwegian and Swedish) are supported.
Test procedure	**Purpose of test:** To verify the support for the Norwegian and English menus. **Equipment:** IRD under test **Test procedure:** Verify the the support for Norwegian and English menu system by accessing the menu system. **Expected result:** IRD has support for the Norwegian and English menu 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	***Task 19:2 Support for GUI resolutions***
Section	Ch19 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall support both standard and high resolution GUI..
Test procedure	**Purpose of test:** To verify the support for the standard and high resolution GUI. **Equipment:**  TS source containing HD and SD services. **Test procedure:** 1. Setup the system 2. Access the menu system when tuned to SD and HD service. 3. Verify the menu system is displayed in standard and high resolution. **Expected result:** IRD displays the menu system in standard and high resolution.
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	***Task 19:3 Support for hearable audio***
Section	Ch19 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall present audio when navigating the menus when possible.
Test procedure	**Purpose of test:** To verify the support for the hearable audio when navigating in menu system. **Equipment:** IRD under test **Test procedure:** Verify the audio is heard when accessing the menu system. **Expected result:** IRD decodes audio (when accessible) when navigating in menu 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	***Task 19:4 Support for displaying Conax CA system information***
Section	Ch19 Riks TV Basic IRD Specifications DTT Norway
Requirement	Serial number and Conax pairing ID shall be easily available in the menu for IRDs with embedded Conax CA.
Test procedure	**Purpose of test:** To verify th IRD is able to display embedded Conax CA system related information. **Equipment:** IRD under test, Conax SMC and Conax CAM. **Test procedure:** Verify the IRD is able to display serial number and pairing ID information for the embedded Conax CA system. **Expected result:** IRD displays serial number and pairing ID for the embedded Conax 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***	

4.17 Task 20: Other Requirements

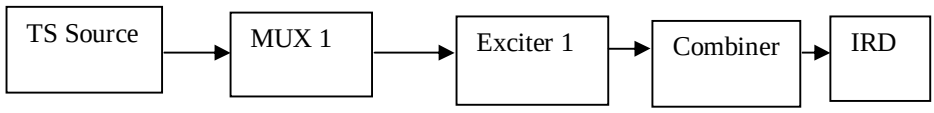
Test Case	***Task 20:1 Automatic standby***		
Section	Ch20.1 Riks TV Basic IRD Specifications DTT Norway		
Requirement	The IRD shall have an option for turning the IRD automatically to standby after a defined time of inactivity. Inactivity is defined as the last time the user pressed a RCU key. The user shall be able to adjust this parameter in the menu. The available values in the menu shall be as follows: 1. Never 2. 4 hours 3. 6 hours 4. 8 hours This value shall by default be set to 4 hours. A dialogue box shall be presented to the user 5 minutes prior to going automatically to standby. The dialogue box shall describe that the IRD will turn automatically into standby and the following option shall be presented: Press OK button to prevent the IRD from going to standby. If the OK button is pressed, the dialogue box shall be removed and the IRD shall not go to standby. If the OK button is not pressed during the 5 minutes, the IRD shall perform a controlled standby routine.		
Test procedure	**Purpose of test:** To verify that the IRD have an option for turning the IRD automatically to standby after a defined time of inactivity **Equipment:** IRD under test **Test procedure:** **Expected result:** IRD has an option for turning to standby after a defined time of inactivity.		
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	***Task 20:2 Support for visually/hearing impaired***
Section	Ch20.2 Riks TV Basic IRD Specifications DTT Norway
Requirement	It is recommended that the IRD support visually/hearing impaired users (see Appendix B). If the IRD has features to support visually/hearing impaired, these functions shall be default set to off
Test procedure	**Purpose of test:** To verify the support for the visually/hearing impaired is disabled. **Equipment:** IRD under test **Test procedure:** Verify the the support for visually/hearing impaired support is disabled by default. **Expected result:** Visually/hearing impaired support shall be disabled.
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***

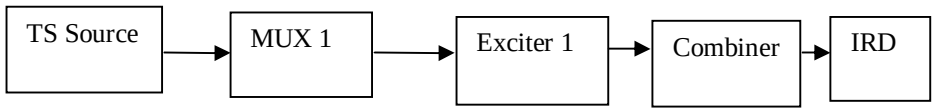
4.18 Task 21: Performance

Test Case	***Task 21:1 Maximum standby to operational time***
Section	Ch21 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall at least support the following performance requirements: • Time from power-on until video/audio is present should be less than: 20s or 35s (20s + update time if changes in the network). The IRD should present a progress indication if the NIT update takes over 15s.
Test procedure	**Purpose of test:** To verify the IRD standby to operational time. **Equipment:** **Test procedure:** 1. Toggle IRD on 2. Measure time to when video and audio are present. **Expected result:** The IRD shall display video and audio after maximum • 20 seconds if no network updates are required • 35 seconds if network updates are required

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	***Task 21:2 Zapping time***
Section	Ch21 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall at least support the following performance requirements: Zapping time: • MPEG-2: see NorDig Unified [2] • MPEG-4: additional time from the cycle time between two I-frames (one GOP), shall be less than 1,0 s for encrypted services.
Test procedure	**Purpose of test:** To verify the zapping time for MPEG-2 and MPEG-4 (SD and HD) services. **Equipment:**  TS source containing encrypted MPEG-4 (SD and HD) services. **Test procedure:** 1. Setup the system 2. Zap between encrypted services 3. Try to evaluate if the the zapping time is maximum 1.0sec + cycle time between I frames GOP 12 — App. 0,5s GOP 15 — App. 0.6s GOP 24 — App. 1s **Expected result:** Zapping time shall be less than 1.0 second addition to I-frame (relation to GOP size) cycle time.
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

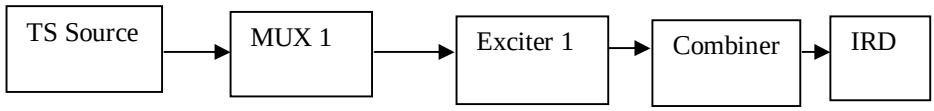
Date		***Sign***	

Test Case	***Task 21:3 Maximum time for ESG/EPG launch***
Section	22 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall at least support the following performance requirements: • Time for launch of ESG/EPG until data is displayed shall be less than: 2s (once the IRD has been tuned to the TS more than the cycle time for the EIT)
Test procedure	**Purpose of test:** To verify the lauch time for ESG/EPG launch. **Equipment:**  TS source containing EIT data with cycle time of 3-5 min (300kbit/s). **Test procedure:** 1. Setup the system 2. Tune to multiplex containing the EIT data 3. Lauch the ESG/EPG 4. Try to evaluate if the time for lauch to displaying the data is maximum 2 sec + the EIT_actual cycle time. **Expected result:** Time for launch of ESG/EPG until data is displayed shall be less than: 2s
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	***Task 21:4 Maximum time for NIT_actual update***
Section	Ch21 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall at least support the following performance requirements: • Time for the IRD to perform a NIT update on the NIT actual less than: 15s

Test procedure	**Purpose of test:** To verify the update time for changes in NIT_actual. **Equipment:** **Test procedure:** Because the update time is most probably very dependent, of which kind of change NIT_actual has, therefore this test is very difficult to test. An indication of the update time is got in chapter 11 [16] automatic updates. **Expected result:** NIT_actual update time shall be maximum 15 seconds.
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	***Task 21:5 Maximum time for service scan***
Section	Ch21 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall at least support the following performance requirements: • Time for the IRD to perform a scan: **4 min.**
Test procedure	**Purpose of test:** To verify the maximum scanning time. **Equipment:** **Test procedure:** Because the scanning time is very dependent of the received multiplexes, and because the scanning time is not defined for a certain amount of the multiplexers, only an indication of the service scanning speed is relevant in this test. Try to evaluate if the service scanning speed is relevant. **Expected result:** Time for the IRD to perform a scan: **4 min.**
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	***Task 21:6 Maximum bit rate for DVB-SI data handling***
Section	Ch21 Riks TV Basic IRD Specifications DTT Norway
Requirement	The IRD shall at least support the following performance requirements: • The IRD shall be able to read and process DVB-SI (including EIT) without losing info (i.e. waiting for next cycle loop) with a speed up to at least **6Mbps**.
Test procedure	**Purpose of test:** To verify the maximum bitrate for the DVB-SI data handling. **Equipment:**  TS source containing DVB-SI data at a bit rate of 6 MBit/s (including EIT). **Test procedure:** 1. Setup the system 2. Tune to TS above 3. Verify if the IRD is able to handle data without losing the data. **Expected result:** IRD is able to handle DVB-SI data with and up to 6MBit/s.
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***

4.19 Task C: Appendix, NIT/Service list examples

Test Case	***Task C:1 Local services in Rogaland.***
Section	Appendix C.1 Riks TV Basic IRD Specifications DTT Norway

Requirement	The first example is taken from the "Rogaland" region on the west coast of Norway. This area has a number of transmitters for the "same" multiplex, but there are two local TV services in the region which only has local coverage. As a consequence, the "Mux3" is generated in two variants, which carry a different local TV service. The two local TV services in the region; "TV Vest" and "TV Haugaland" are both assigned the same channel number in the LCN descriptors in the NIT table. This causes a conflict in the case that the receiver can receive both variants and care must be taken to arrange the channel list correctly. On our example, "TV Vest" is transmitted in transport stream 0x0277 and "TV Haugaland" is in transport stream 0x0278.
Test procedure	**Purpose of test:** To verify that the IRD shall be able to generate correct channel list in a region where there is collision between two local TV channels in the same region and decide which one to use depending on signal strength/quality. **Equipment:** **Test procedure:** 1. Playout local TV 1 and 2 stream 2. Change signal parameters accordingly (See table below). 3. Check that correct channel is placed on channel 19.

TV Haugaland	**TV Vest**	**Selected**	**Correct**
Frequency: 762.000 MHz Strenght: 100% Quality: 100% C/N: 27dB BER: -7	Frequency: 546.000 MHz Strenght: 38% Quality: 89% C/N: 20dB BER: -5	TV Haugaland (Ch 19) TV Vest (Ch 22)	TV Haugaland (Ch 19)
Frequency: 762.000 Mhz Strenght: 38% Quality: 87% C/N: 20dB BER: -5	Frequency: 546.000 MHz Strenght: 100% Quality: 100% C/N: 27dB BER: -7	TV Vest (Ch 19) TV Haugaland (Ch 22)	TV Vest (Ch 19)
Frequency: 546.000 MHz Strenght: 100% Quality: 100% C/N: 27dB BER: -7	Frequency: 762.000 Mhz Strenght: 38% Quality: 87% C/N: 20dB BER: -5	TV Haugaland (Ch 19) TV Vest (Ch 22)	TV Haugaland (Ch 19)
Frequency: 546.000 MHz Strenght: 38% Quality: 89% C/N: 20dB BER: -5	Frequency: 762.000 MHz Strenght: 100% Quality: 100% C/N: 27dB BER: -7	TV Vest (Ch 19) TV Haugaland (Ch 22)	TV Vest (Ch 19)

	Expected result: IRD is able to select correct local TV channel when LCN collision inside one region
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	***Task C:2 Neighbouring regions and special services.***
Section	Appendix C.2 Riks TV Basic IRD Specifications DTT Norway

Requirement	All regions have its local variant of NRK1, which is common to all transmitters in the region as well as some ”special services” that are signalled with LCN in the 900 to 999 range. Many viewers can receive signals from neighbouring regions and the receiver must therefore correctly handle selection of the NRK1 service as well as the special services. The same LCN is assigned to different services in the two regions. This is not seen as a ”LCN conflict” and the ”All services list” shall be ordered and numbered with priority to the ”favourite region” specified by the user as specified in chapter 10.1. This should results in the following ”All services lists” in a receiver that places both TV and Radio services in the same list for viewers that can receive both transport streams. Receivers with separate TV and Radio lists (recommended) shall simply split the lists into two. Services from other multiplexes are omitted for clarity.
Test procedure	**Purpose of test:** To verify that the IRD stores NRK1 TV services according to RiksTV's expected channel list from Region 1 and Region 2 in All service list **Equipment:** **Test procedure:** 1. Playout local TV 1 and 2 stream 2. Check that the service list is according to the table below

If “Oslo” is defined as favourite region.		If “Buskerud” is defined as favourite region.	
#	Service	#	Service
1	NRK 1 Østlandssendingen	1	NRK1 Østafjells
2	NRK 2	2	NRK 2
5	TV 3	5	TV 3
6	NRK Super / NRK 3	6	NRK Super / NRK 3
9	Viasat4	9	Viasat4
14	Disney Channel	14	Disney Channel
15	NRK1 Østafjells	15	NRK 1 Østlandssendingen
200	NRK P1 Oslo/Akershus	200	NRK P1 Oslo/Akershus
201	NRK P2	201	NRK P2
202	NRK P3	202	NRK P3
203	NRK mP3	203	NRK mP3
204	P4 Lyden av Norge	204	P4 Lyden av Norge
205	Radio Norge	205	Radio Norge
206	Radio 1 Oslo	206	Radio 1 Oslo
207	NRK Super	207	NRK Super
208	NRK Sport	208	NRK Sport
209	NRK Alltid Nyheter	209	NRK Alltid Nyheter
210	NRK Sámi Radio	210	NRK Sámi Radio
211	NRK Gull	211	NRK Gull
212	NRK Jazz	212	NRK Jazz
213	NRK Folkemusikk	213	NRK Folkemusikk
214	NRK Klassisk	214	NRK Klassisk
215	NRK Stortinget	215	NRK Stortinget
998	NRK Tegnspråk	998	NRK Tegnspråk
999	NRK1 Østnytt	999	NRK1 Østfold
1000	NRK1 Østfold	1000	NRK1 Østnytt

Test procedure (cont.)	**Expected result:** IRD is able to store NRK1 TV services according to RiksTV's expected channel list from Region 1 and Region 2 in All service list
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***