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**TECHNICAL REQUIREMENTS FOR USING  
SIMPLITV BRAND FOR  
SATELLITE SETTOPBOXES**

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**Version 1.1 - 12.06.2017**

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## Notice

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## 1 DOCUMENT HISTORY

Version	Date	Comments
	02.11.2016	DRAFT release
1.0	05.01.2017	Initial release (final version) <ul style="list-style-type: none"><li>• Added document history paragraph</li><li>• 3.4 Remote Control Unit (RCU): Added minimum requirements for RCU keys</li></ul>
1.1	12.06.2017	Minor changes: <ul style="list-style-type: none"><li>• Specified TP and bouquet id for Irdeto SSU update.</li></ul>

## 2 TECHNICAL MINIMUM REQUIREMENTS

The Receiver shall be compliant to the “HDTV – IRD Guidelines Austria v4.0” [1]. On top of the requirements specified in [1] the following requirements described in this document shall apply.

## 3 HARDWARE REQUIREMENTS

### 3.1 Power Consumption

The receiver shall follow the paragraph 2.4.2 “Energy Efficiency” of Nordig Unified Requirements [5]

### 3.2 Power Switch

The Receiver should have a power switch. In the case the power switch is “off”, the Receiver shall be physically disconnected from any power supply.

### 3.3 Display

The receiver shall have at minimum a LED indicator to show the operational status of the receiver:

Green LED: shall indicate that the receiver is in operational mode

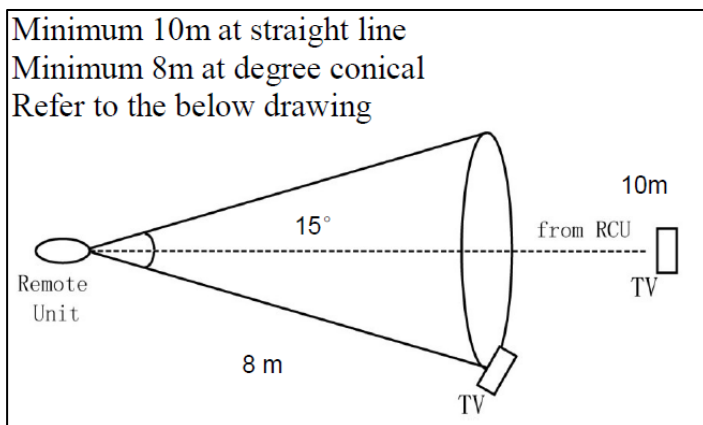
Red LED: shall indicate that the receiver is in standby or deep standby mode.

The Receiver should have a Display showing the actual program number. When a display is implemented than it shall follow these logical steps:

- Operational mode: Display shall show the program number of the actual tuned service (either TV or radio)
- Standby mode: Display shall show the actual time (hh:mm)
- Deep standby mode: The Display shall remain black.

### 3.4 Remote Control Unit (RCU)

The Remote Control Unit shall work properly with the Receiver in a range as shown in the following drawing.



The RCU shall implement the following keys:

- TEXT
- MENU
- OK
- EXIT/BACK
- Left-Right-Up-Down
- TV/R
- Vol Up/Down
- Channel Up/Down
- EPG
- INFO

The RCU should implement the following keys:

- FAV (open favorite channel list)
- LIST (open channel list)
- Return to previous channel
- Subtitle
- Audio
- System message key (Irdeto Mail/Text message inbox)

If not provided by dedicated buttons the functions shall be easy accessible via OSD

### **3.5 USB**

The Receiver shall have one or more USB Ports. The USB Port(s) shall be placed on the back- and / or front panel of the Receiver.

The USB connector shall be compliant to USB Specification Version 2 [2] or higher.

The USB Port shall supply power to connected USB devices. The power supplied shall have a minimum of 500 mA / 5 V DC.

In case the receiver supports Wifi connectivity via a Wifi-Dongle and PVR ready functionality the receiver should provide a second USB port for PVR recording.

### **3.6 Digital Audio S/PDIF Interfaces**

The digital audio interfaces shall be capable of carrying audio bitstreams and decoded stereo PCM audio. The receiver menu function shall provide an option to select either bitstream or PCM audio on those interfaces.

### **3.7 Digital Audio Video Interface (HDMI)**

In addition to these requirements the receiver menu function shall provide an option to select either bitstream or PCM audio on this interface.

## **4 TUNING AND SCANNING PROCEDURE**

### **4.1 FTI (First Time Installation)**

The initial set up routine shall be started immediately after the first activation of the receiver. If the initial setup routine is interrupted the receiver shall execute the first time installation routine again after reboot until the procedure is finished successfully.

The first time installation routine shall include at minimum following items:

- Menu language selection (German, English are the minimum requirement)
- Network settings (in case the receiver is capable to connect to internet services)
- Service list selection (Standard or simpliTV) for tuning
  - Both tuning options shall be visible on the screen.

During first time installation procedure the receiver shall offer a Standard channel list tuning option (according to HDTV – IRD Guidelines Austria v4.0” [1] – chapter 3.1.5) as well as a simpliTV channel list tuning option.

- The Standard channel list shall be the default choice for the customer especially during first time installation routine but also at any later time when the satellite scan is initiated from the tuning menu.
- The simpliTV tuning option shall be in the same context/menu hierarchy as the Standard channel list option. Both the Standard and the simpliTV option shall be presented on screen side by side. For the sake of clarity the user shall not need to go into any submenu or drop down box to select the simpliTV tuning option.

## 4.2 Channel lists

After channel search has been completed the receiver should provide separate lists for TV and radio services.

In addition to the required service lists the receiver might implement additional favorite program lists which may be modified by the user.

The receiver shall always select the service list and service that has been active before user switched receiver to standby so that on next power-on of the receiver the service/list that has been watched is selected.

### 4.2.1 Standard channel list

The standard channel list requirements are defined in HDTV – IRD Guidelines Austria v4.0” [1] – chapter 4. - Tuning/Scanning Procedures.

### 4.2.2 simpliTV channel list (LCN)

The simpliTV tuning option uses Nordig logical channel numbering descriptor which is broadcasted in the BAT of following Transponders on Astra 19.2°E:

Parameter: Astra 1KR, 11273.25, H, 22000, 2/3

In the LCN the simpliTV Bouquet as well as other TV services that are relevant for the Austrian market will be referenced.

#### 4.2.2.1 Bouquet Association Table (BAT)

Bouquet\_ID: 0x3700

Bouquet\_name: ORS comm GmbH & Co KG

Country\_Code\_of\_Validity: 905

Private\_data\_specifier\_ID: 0x000001B0

**Table 4: Bouquet association section**

Syntax	No. of bits	Identifier
bouquet_association_section(){		
table_id	8	uimsbf
section_syntax_indicator	1	bslbf
reserved_future_use	1	bslbf
reserved	2	bslbf
section_length	12	uimsbf
bouquet_id	16	uimsbf
reserved	2	bslbf
version_number	5	uimsbf
current_next_indicator	1	bslbf
section_number	8	uimsbf
last_section_number	8	uimsbf
reserved_future_use	4	bslbf
bouquet_descriptors_length	12	uimsbf
for(i=0;i<N;i++){		
descriptor()		
}		
reserved_future_use	4	bslbf
transport_stream_loop_length	12	uimsbf
for(i=0;i<N;i++){		
transport_stream_id	16	uimsbf
original_network_id	16	uimsbf
reserved_future_use	4	bslbf
transport_descriptors_length	12	uimsbf
for(j=0;j<N;j++){		
descriptor()		
}		
}		
CRC_32	32	rpchof
}		

For each transponder that contains services that simpliTV references there will be one transport stream loop. In each loop there are following descriptors:

- Service List descriptor (0x41)
- Private\_data\_specifier\_descriptor (0x5F)
- Logical\_channel\_descriptor (user defined 0x83)

#### 4.2.2.2 NorDig private; Logical Channel Descriptor (tag: 0x83)

The syntax of the Logical Channel Descriptor (version 1) is shown in Table 12.11.

Syntax	No. of bits	Identifier
logical_channel_descriptor(){		
descriptor_tag	8	uimsbf
descriptor_length	8	uimsbf
for (i=0;i<number_of_services;i++){		
service_id	16	uimsbf
visible_service_flag	1	bslbf
reserved	1	bslbf
logical_channel_number	14	uimsbf
}		
}		

Table 12.11 Logical\_Channel\_descriptor (LCD v1)

Data in this descriptor shall be treated as quasi-static and is used to order services in the IRD's service list. The descriptor enables the IRD to create a service list during the first time installation routine or at any later time when the user triggers a new satellite service scan.

#### 4.2.2.3 Service list structure

The simpliTV LCN will reference services from Program place number 1 to 399. Services not referenced in the simpliTV LCN are to be placed from 400 onwards.



#### 4.2.2.4 Manual changes to the service list

The user shall have the option to make manual changes to the services list (eg. move, delete, add services). In case of simpliTV LCN service list update it is acceptable to overwrite manual changes made by the user.

#### 4.2.2.5 Sorting of services inside the channel list

All "visible" services shall be displayed in the service list, sorted according to logic\_channel\_number and to be addressed with a number in the service list equal to the logic\_channel\_number.

Services without LCN shall be placed from 400 and above. The order mechanism of these services is up to the manufacturer implementation.



In order to avoid a complete rearrangement of the list when services are added gaps in the LCN service area are allowed. For the sake of clarity empty program places shall not be shown in the service list neither empty slots shall be selectable by the customer during normal channel zapping operation.

#### **4.2.2.6 Conflict handling of Logic\_channel\_number**

If several services are allocated to the same logic\_channel\_number, (within the same channel list) one service shall be ordered according to the logic\_channel\_number (service with lowest SID) and the others shall be placed after the last valid LCN service (empty spaces in the broadcast logic channel numbering shall not be used) or at the end of the service in case program place 399 is already allocated.

#### **4.2.3 Automatic simpliTV service list update**

The receiver shall implement a function for an automatic service list update. This is to ensure that new services added to the simpliTV LCN list are added to the service list according to their desired LCN.

The default setting for this function shall be “on” but the receiver menu shall offer an option to deactivate this function.

The user shall be notified about the availability of a new simpliTV list via an on screen dialog (version in BAT table changed) when the receiver is turned on. The user shall have the option to decline or accept the update. If the user accepts the update the receiver shall apply the new LCN to the service list. If user declines the update the notification dialog shall appear again two times at next power on of the receiver. After that the notification shall not anymore appear on screen until next BAT version change.

Preferably the receiver should implement two lists for each category (TV/Radio). One list should be controlled by the LCN (main service list) and cannot be changed by the user and the second list should allow for manual changes made by the user. In case new services added by LCN these services shall be appended at the end of this second service list.

### **4.3 Dynamic PSI & SI**

The receiver shall implement dynamic PSI update function as specified in [1]- chapter 3.1.5. The receiver shall be able to handle changes in PSI in the PMT, BAT, CAT and PAT (e.g changes of PIDs and availability of components) in a graceful way for the user.

The receiver shall be able to manage changes in the SDT and NIT (actual).

The receiver shall be able to handle dynamic changes in the Program Map Table (PMT).

The receiver shall be able to handle dynamic changes in the BAT.

## **5 CA SYSTEM**

### **5.1 Conditional Access System**

The embedded CA System shall meet all requirements as specified in [1] - chapter 7. The receiver shall be able to handle all relevant CCA specific function and especially:

- Irdeto Unique Announcements and Mail messages
- Global announcements and Mail messages

- Parental control pin code reset by headend
- Set Parental pin code by headend
- Execute new channel search procedure initiated by headend (SOSCAN/GOSCAN)

## **5.2 Irdeto Messages**

All relevant Irdeto Messages shall be according to [1].

## **5.3 Pre Enablement**

The embedded CA System shall support Secure pre-enablement (SPE) as specified in [1] - chapter 7.2.

# **6 SOFTWARE/MIDDLEWARE REQUIREMENTS**

## **6.1 EPG**

The EPG should include a miniature live video of the currently tuned service.

The Receiver should provide a grid style EPG, representing information from the EIT and present/following tables of the SI of all received transponders.

The EPG should be formatted as a matrix: all available TV channels shall be shown in one column. Right to this column a timeline shall show the present and all succeeding program events. Every event shall be selectable. If selected, the full text information of this event shall be shown.

In case of PVR scheduled recordings should be booked via this EPG. Events for which a recording has been booked shall be indicated accordingly.

## **6.2 Service selection list**

The channel list should be easily available to the user by a dedicated button on the remote control or a menu function.

When a service is highlighted in this channel list the receiver should show a progress indicator bar of the present event.

It should be easily possible to switch between other service lists (if available) within this service list view (e.g second service list, favorite lists).

It shall be possible to scroll the service list page wise.

## **6.3 Info Banner**

The Info banner shall be displayed for a short period when the user changes service, when activated via RCU button or menu function.

The device shall derive information from DVB SI EITp/f tables.

## **6.4 Service list manager**

The receiver software shall include a menu function to easily manage the TV and radio service lists.

## 6.5 Teletext

The receiver shall support Teletext as described in [1]- chapter 6.

The RCU shall provide a dedicated button to activate the Teletext view. The same button should be used to close the view and return to live video.

The receiver shall implement the function to automatically cycle through the available subpages as well as to manually select a dedicated subpage (in this case the automatic cycling through the subpages shall be stopped and the desired subpage shall remain on screen unless the user select “Auto” mode again).

The font used for presenting the Teletext shall be well-proportioned and character spacing and line pitch shall be in a way that the whole text is easily readable.

## 6.6 HbbTV

The Receiver may support HbbTV. If the receiver is able to connect to internet services HbbTV as specified in [1] is mandatory.

## 6.7 PVR ready functionality

If the receiver provides PVR functionality it shall follow the requirements as described in [1].

## 6.8 Software update

The receiver shall implement software update feature as specified in in [1]

In addition following paragraphs shall apply.

### 6.9 OTA Update

The receiver shall periodically check for OTA updates or when triggered via a menu function. The update will be announced in linkage\_descriptor of BAT (bouquet\_id 0xff00) on TP1003 (Astra 1KR, 11.24375 GHz, H, 22000, 2/3).

#### 6.9.1 Manual OTA Update

If the receiver detects an OTA update which is signaled as “manual update” (according to Irdeto SSU mechanism) the receiver shall activate the software update menu item so that it can be manually triggered by the user.

#### 6.9.2 Automatic OTA Update

In case a system software update is on-air which is signaled as “automatic update” (according to Irdeto SSU mechanism) the receiver shall notify the user via an on screen dialog. Within this dialog it shall be possible for the user to accept or decline the update. The user shall have the option to decline the update three times. The next time the update procedure shall start automatically.

*Note: If the loader sequence number of installed software is equal or higher to OTA software the notification dialog shall not appear on screen.*

## 6.10 USB Software Update

The receiver shall implement a function to update the system software via the USB interface. In case a USB device with system software is connected to the receiver the user shall be notified via an on screen dialog about the availability of the update. The user shall have the option to accept or decline the update.

*Note: If the loader sequence number of installed software is equal or higher to software on USB memory the notification dialog shall not appear on screen.*

## 6.11 Boot Time

Cold Start Boot time shall be shorter than 35 seconds. Cold Start Boot time means the time between turning on the power supply for the receiver and viewing a visible frame of an HDTV- or SDTV-TV channel.

Boot Time from Standby Mode shall be shorter than five seconds.

The User shall be informed of the status of the boot process via a progress bar.

## 6.12 Zapping Time

Zapping time shall be shorter than 2.5 seconds for unscrambled services.

Zapping time shall be shorter than 3.0 seconds for scrambled services.

Zapping Time means the time between pressing the channel-up or channel-down button on the RCU and viewing a visible frame of the selected channel.

## 6.13 USB Media Player

The Receiver should be able to play back media content from a connected USB stick or harddrive.

If the receiver implements a Media player than it shall support following Video, Audio and picture formats:

Fileformat	Videocodec	Audiocodec
.mpg .mpeg	MPEG1, MPEG2	MPEG Layer 1, 2, 3
.dat, .vob, .ts	MPEG2	MPEG Layer 1, 2, 3 E-AC3, AC3
.mkv	MPEG 1, MPEG 2 H.264	MPEG Layer 1, 2, 3 AAC E-AC3, AC3
.mp4, .m4v	Xvid H.264	MPEG Layer 3 AAC E-AC3, AC3
.avi	Xvid H.264	MPEG Layer 3 AAC E-AC3, AC3
.mov	H.264	PCM AAC

The Mediaplayer shall support following Music Formats:

Fileformat	Audiocodec
------------	------------

.mp3	MPEG Layer 1, 2, 3
.ogg	OGG Vorbis
.aac	AAC
.wav	PCM

The Mediaplayer shall support following Photo Formats:

Fileformat	Pictureformat
.jpg, .jpeg	JPEG
.bmp	Bitmap

The following trick play modes shall be supported:

- Jump to chapter
- Fast Forward 2x, 4x, 8x, 16x, 32x
- Pause
- Stop and Resume (information stored for at least 5 assets) – user shall be asked if he wants to resume at XX:XX or start from the beginning.

## 7 PACKAGING, BRANDING, MARKETING COLLATERALS

The Receiver, all Peripherals, Packaging and Marketing Collaterals shall observe all specifications of the Brand Book [6].

## 8 REFERENCES

[1]	Technical Minimum Requirements	HDTV -- IRD GUIDELINES AUSTRIA Version 4.0
[2]	Universal Serial Bus	Universal Serial Bus (USB) Specification, Revision 2.0, April 27, 2000.
[3]	EBU Tech 3333	EBU HDTV Receiver Requirements, March 2009
[4]	CI Plus Specification v 1.3.1	CI Plus Specification Minimum Version 1.3.1 available at <a href="http://www.ci-plus.com">http://www.ci-plus.com</a>
[5]	NorDig Spec	NorDig Unified Requirements for Integrated Receiver Decoders for use in cable, satellite, terrestrial and IP-based networks, Version 2.5.1
[6]	Simpli Brand Book	Simpli Brand Book, recent version