

# **MHP Specifications DTT Norway**

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## 1 Introduction

This document describes the requirements for MHP IRDs for the Norwegian DTT market and is an amendment to the “Basic IRD Specifications DTT Norway”. I.e. the requirement in this document comes as an addition to the requirements in the “Basic IRD Specifications DTT Norway”. MHP applications and signalling of MHP applications will be designed to function with receivers that are compliant with this specification.

## 2 MHP version

The IRDs shall comply with DVB MHP 1.1.3 (ETSI TS 102 812 v1.3.1) Interactive Broadcast Profile 2. NTV will accept that conformance tests are completed according to the most recent released test suite until a test suite for version 1.1.3 is available.

If compliance testing is done with a test suite other than 1.1.3, the manufacturer shall run the IRD through test suite for 1.1.3 when it becomes available. If for any reason the IRD fails during the testing, it is the manufacturer’s responsibility to correct the software and provide new software for over-the-air distribution that is MHP 1.1.3 compliant.

Information on MHP version and which test suite it has passed shall be available in the IRDs menu system.

## 3 APIs

The following APIs shall be included:

- API for IP based interaction channel. The API shall include support for TCP/IP over Ethernet, including HTTP and DHCP protocols. Browser functionality is not required.
- Stored applications (minimum 2 MB persistent storage, whereas 500 KB reserved for NTV)
- Security – authentication of applications and certificate management. The IRD shall act in accordance with the security regime established by NTV.
- PVR/PDR Extension to MHP shall be implemented for receivers with built in hard drive (PVRs)

## 4 Graphics capabilities

The MHP IRD shall have the following graphics capabilities:

- (16 bit): ARGB 4:4:4:4 and (optional) RGB: 5:6:5.
- Support displaying MPEG video with horizontal scale factors of 2, 1, 1/2, 1/3, 1/4, and vertical scale factors of 2, 1, 1/2, 1/3, 1/4.
- Support 3 logical display planes:

- Graphic plane I for MPEG I-still frames, JPEGs, GIFs, PNGs and MPEG Video drips (optional).
  - Video plane for full screen MPEG video.
  - Graphic plane II for graphics (full screen).
- Simultaneous overlapping displays of all planes.

## 5 Remote control

The IRDs remote control shall be according to the following specifications as well as the remote control specifications in “Basic IRD Specifications DTT Norway – v1.1”. The “Basic IRD Specifications DTT Norway – v1.1” shall take precedence over the remote control specifications in case of conflicts between these two specifications.

Please also note the recommendations for hearing/visually impaired people in Annex B of “Basic IRD Specifications DTT Norway – v1.1”

The key events shall be according to the following table:

Function	Keys	Key event (for MHP)
Channel up/down	P+/P-	VK_CHANNEL_UP/VK_CHANNEL_DOWN
Volume	V+/V-	VK_VOLUME_UP/VK_VOLUME_DOWN
Toggle audio on/off	Mute	VK_MUTE
In/out of standby	Stand-by	VK_POWER
Navigation	Left/Right/Up/Down	VK_LEFT/VK_RIGHT/VK_UP/VK/DOWN
Selection	OK	VK_ENTER
Color	Red/Green/Yellow/Blue	VK_COLORED_KEY_0/VK_COLORED_KEY_1/ VK_COLORED_KEY_2/VK_COLORED_KEY_3
Number	0-9	VK_0 to VK_9
Link to ESG	Info	VK_INFO
Link to EPG	Guide	VK_GUIDE
Link to IRD settings	Menu	
Teletext	Text	VK_TELETEXT
Subtitling toggle	Subtitling	VK_SUBTITLE
Exit back to TV	Exit	VK_ESCAPE
Toggle Radio/TV mode	Radio/TV	
Apps	Apps	
Back	Back	VK_BACK_SPACE

Channel up/down and volume up/down shall always be functional.

## **5.1 Numeric keys**

The numeric keys (0-9) shall be labelled with numbers and in addition with letter labels according to ETSI ES 202 130 v1.1.1.

Numeric key events shall be passed on to the navigator to allow channel change when not captured by the application (key listener or user event listener). This is to allow channel change even if an application is running in the background.

## **5.2 Navigation keys**

Arrow keys (left, right, up, down) and OK. Back key for general purpose (intended for application to use as back key).

## **5.3 Exit key**

The exit key shall kill all running applications and set the STB in pure audio, video and subtitling mode. However, if the MHP application has implemented a “soft kill” through hiding the application and allowing the STB to perform as in pure audio, video and subtitling mode, the exit key shall set the MHP application to this mode. This is only acceptable if it significantly shortens the time used to re-enter the application.

## **5.4 App key**

The app key is a STB proprietary key, which gives access to a list of applications within the actual service. All applications signalled as visible to user (11) shall be visible independent of whether the application is set to autostart or not.

## **5.5 Colour keys**

The order of the four colour keys shall be Red, Green, Yellow and Blue.

## **5.6 Blue key**

The blue key shall be dedicated for use by MHP applications. This implies that the STB shall not assign any native applications to this key.

## **6 Interaction between MHP applications and STB native applications**

If a STB native application (Menu, EPG, etc) is accessed while an MHP application is running, the MHP application shall **not be killed**, but set to paused state. After such native application is exited, the MHP applications shall be set to running and regain focus.

## **7 Application autostart**

Application autostart shall by default be set to ON.

All applications signalled as visible to user shall be visible independent of whether the application is set to autostart or not when the app key is pressed.

## 8 Subtitling

DVB Subtitling shall be implemented according to MHP specifications. Please see “Basic IRD Specifications DTT Norway – v1.0” for general information on DVB subtitling on the Norwegian DTT platform.

## 9 Requirements to MHP applications

This chapter applies to applications provided by broadcasters, i.e. not native applications.

### 9.1 Remote Control

The following table specifies the use of remote control keys in MHP applications.

Function	Keys	No use	Limited use	Free use
Channel up/down	P+/P-	X		
Volume	V+/V-	X		
Toggle audio on/off	Mute	X		
In/out of standby	Stand-by	X		
Navigation	Left/Right/Up/Down		X	
Selection	OK		X	
Color	Red		X	
Color	Green		X	
Color	Yellow		X	
Color	Blue			X
Number	0-9		X	
Link to ESG	Info	X		
Link to EPG	Guide	X		
Teletext	Text		X	
Subtitling toggle	Subtitling	X		
Exit back to TV	Exit		X	
Back	Back		X	

Keys classified under “Limited use” should only be captured by a MHP application if this improves the usability and never when the MHP application is in pause state.

## **9.2 Hidden applications**

The blue key can be used to trigger hidden MHP applications. This would be MHP applications that in running state have implemented a sleep mode. A sleep mode is often used to let the user perform a “soft kill” of the MHP application to shorten the start up time when the user wants to re-enter the MHP application.

## **9.3 DVB URL**

It is not recommended to make reference to Network IDs or Transport IDs in the application, due to the fact that Network IDs will be different in the different regions. Exceptions to this are applications intentionally regionalized and different AITs are provided in separate transport streams.

## **9.4 HScene**

A full screen HScene shall not be used in services where the user is expected to be able to access the DVB subtitling.

## **9.5 Scaling**

The MHP application must handle a vertical resolution of both 720 and 1080. The application must be able to maintain correct resolution when the TV is switched off and on while the MHP application is running.

## **9.6 Pause state**

The Xlet’s pause state shall be implemented. This is necessary as a running MHP application will put in pause state if a native application is launched. Entering pause state the MHP application shall remove all graphic objects to avoid conflict with the native application. All unnecessary resources shall be released and operations using large amount of processor power stopped.

## **9.7 DestroyXlet**

The destroy Xlet state should release all resources used by the MHP application. This includes all threads, memory, persistent storage, graphic layers, image objects, return channel, key listeners and other listeners. The video layer should be scaled and positioned as its original state.

## **9.8 Time data**

The interface org.dvb.si.SITime shall be used to get current time. This interface represents the Time and Date Table (TDT) and the (optional) Time Offset Table (TOT).

## **9.9 Application Signing**

The applications shall be signed in accordance to the prevailing procedures from NTV.