

**REPUBLIC OF MACEDONIA  
AGENCY FOR ELECTRONIC COMMUNICATION**

**RULEBOOK ON THE INTEROPERABILITY OF DIGITAL TELEVISION EQUIPMENT USED BY  
THE CONSUMERS (DVB-T receiver)**

**September, 2014**

**Skopje**



Pursuant to Article 24, paragraph 1, indent 3, and related to Article 158, paragraph 6, of the Law on Electronic Communications ("Official Gazette of the Republic of Macedonia" no. 39/2011), on 03.09.2014, the Director of the Agency for Electronic Communications adopted the following

## **RULEBOOK ON THE INTEROPERABILITY OF DIGITAL TELEVISION EQUIPMENT USED BY THE CONSUMERS (DVB-T receiver)**

### Article 1

This Rulebook defines the interoperability of digital television equipment used by consumers for the reception of digital terrestrial TV signals (DVB-T).

### Article 2 (used terms)

The terms used in these Rulebook, shall have the following meaning:

1. Digital television equipment (DVB-T receiver<sup>1</sup>) is an electronic communications equipment intended for exchange and transfer of information, enabling the user additional services (transfer of images, sound and data with the ability to use interactive communication).
2. SDTV<sup>2</sup> - Standard Definition TV.
3. HDTV<sup>3</sup> - High Definition Television.
4. EPG<sup>4</sup> - Electronic Programming Guide

(2) The other expressions used in these Rulebook shall have the same meaning as defined in the Law on Electronic Communications.

### Article 3 (types of receivers)

Digital TV receiver (DVB-T receiver) may be:

- receiver that connects to the TV device (STB - set-top box) and
- TV device with built-in DVB-T receiver.

The receivers referred to in paragraph one of this Article, must be able, upon the initial activation of the receiver and when selecting the country, to select Macedonia.

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<sup>1</sup> DVB-T-Digital Video Broadcasting - Terrestrial

<sup>2</sup> SDTV – standard definition television

<sup>3</sup> HDTV – high definition television

<sup>4</sup> EPG – electronic programming guide

Once the country is selected, when selecting voice language, translation language and alphabet, the receiver must provide selection of Macedonian voice, translation into Macedonian and menu in Macedonian using the Cyrillic alphabet.

Article 4  
(main technical parameters)

The receivers referred to in Article 3 of these Rulebook, shall have the following main technical parameters:

- (1) Transport stream - The receivers referred to in Article 3 should support streams with variable bit rate (VBR support)
- (2) Audio Decoder - The receivers referred to in Article 3 must support decoding of MPEG-1/MPEG-2 layer I/layer II audio compression as per the standard ISO/IEC 11172-3. The support for selecting multiple voice languages for individual programme content shall be mandatory.
- (3) The receivers referred to in Article 3, when selecting the Macedonian voice, should have support for Macedonian audio descriptor labelled *mac*.
- (4) Video decoder – The receivers must support decoding of MPEG-4 Part 10 / H.264 AVC video compression as per the standards ITU-T H.264 and ISO/IEC MPEG-4 AVC (previously ISO / IEC 14496-10 - MPEG-4 Part 10 Advanced Video Coding), with a video component with constant or variable bit rate.
- (5) The receivers referred to in Article 3 must support reception of 4:3 and 16:9 aspect ratio, with the option to manually or automatically change the format by using a letter-box, pillar-box and pan&scan conversion.
- (6) The receivers referred to in Article 3, when displaying the EPG content, have to support the Cyrillic block UTF-8 character set as per the standard Unicode ISO10646. For the display of Latin characters, they have to provide support as per the standard ISO6937 character set.
- (7) The receivers referred to in Article 3 should support a Macedonian translation language descriptor labelled *mac*.
- (8) The receivers referred to in Article 3 should support logical channel numbering (LCN - Logical Channel Number) allowing an initial layout of the channels saved from the search in the order determined by the Broadcasting Council as per the Rulebook on the allocation of multiplex capacities.
- (9) The receivers referred to in Article 3 should have a date and time support using the tables from the standard EN 300744.

Article 5  
(*interoperability of analogue and digital television equipment*)

- (1) The receivers of digital television signals have to meet the requirements laid down in the standard MKS EN 62216:2012, that is to say, receive and demodulate a DVB-T signal transmitted in accordance with the standard EN 300744. Additionally, the receiver can receive and demodulate DVB-T signal transmitted in accordance with standard EN 302755 (DVB-T2).

- (2) The digital television equipment must provide reception of unencrypted signals, as well as signals encoded according to the European standard DVB CSA (common scrambling algorithm), as recommended by a recognized European standards organization.
- (3) Each analogue television receiver with screen size above 42cm must have at least one auxiliary connection in accordance with a standard of a recognised European standards organisation, that is to say, the standard CENELEC EN 50049-1:1997 SCART, enabling simple connection of external devices, including decoders and receivers of digital television signals.
- (4) Each television receiver with built-in decoder of digital television signals (DVB-T), with screen size above 30cm, should have at least one auxiliary connection, as standardised by a recognised European standards organisation, or in compliance with a specification widely accepted by equipment manufacturers in that field. This type of connection (common DVB-T interface connector) should allow for easy connection of external devices and transmission of all elements of the digital television signal.

Article 6  
(special requirements for the receiver connected to a TV device - STB)

STB - receiver connected to a TV device supporting SDTV - standard definition television must have RCA or SCART output.

STB – receiver connected to a TV device supporting HDTV – high definition television, must have HDMI output.

Article 7  
(other requirements)

The receiver should be able to detect the age restriction rating, when such information is entered in the system. The rating of programmes should be in accordance with the standard MKS EN 300468 (parental control).

Article 8  
(parameters for reception of DVB-T signals)

- (1) Frequency bands and the receiver signal level - The receiver should be able to receive signals in the frequency band VHF 174-230 MHz and UHF 470-862 MHz, with an input signal level range between -75dBm and -23 dBm or wider. It is recommended that the receiver provides reception of signals only in the frequency band UHF 470-790 MHz in order to avoid possible interference caused by transmitters in the land mobile service.
- (2) The receiver can support a signal quality and signal level indicators, and automatic and manual programme search.

(3) Terrestrial demodulator

DVB-T COFDM,	
Video compression	MPEG-4
SFN support	YES
Transmission mode	8k

Channel bandwidth	VHF - 7 MHz; UHF - 8 MHz
Modulation	QPSK, 64-QAM
Guard interval	1/4, 1/8, 1/16, 1/32
Inner code-rate	1/2, 2/3, 3/4, 5/6, 7/8
Scanning Step	166.66 KHz

Article 9  
(transitional and final provisions)

- (1) The provisions of this Rulebook addressing the compulsory introduction of selection of country, voice language, translation language and alphabet, and logical channel numbering (LCN - Logical Channel Number) will be applicable from 01.01.2015.
- (2) This Rulebook shall enter into force the following day after its publication in the "Official Gazette of the Republic of Macedonia".
- (3) Upon the entry into force of this Rulebook, the Rulebook on the operational requirements of digital television equipment used by consumers (DVB-T receiver) (Official Gazette of Republic of Macedonia no. 185/2013) shall cease to be valid.
- (4) Upon its entry into force, the Rulebook shall be published on the Agency web-site.

AGENCY FOR ELECTRONIC COMMUNICATION

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