

TLN WRO Specification type Document

< Requirement specification for AO STB Digital
Video Broadcast - Cable (**DVB-C**) signaling
subsystem to enable usage of TLN ROTV >



Document Housekeeping

Document Category and type

CAT	TYPE	DOC ID	Comment
(i)DTV	SPEC	TLN-WRO-TA-I-S-PAAC	Specification type documents (-SPEC) are documents specifying logical / physical interfaces / protocols, etc..., to which AO equipment/systems need to comply

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List of Appendixes

This document may refer to further detailed documents that are added in Appendixes to this document.

A reference to an appendix is in this document highlighted with grey background.

The list with appendixes of this document:

None.

List of References

This document may refer to external documents or information sources.

A reference to an external document or information source is in this document highlighted with grey background.

The list of referred external documents or information sources in this document:

Reference 1 : TLN WRO CAT: (i)DTV : TLN-WRO-TA-I-C-PAAC

Reference 2 : TLN WRO CAT: (i)DTV : TLN-WRO-TA-I-S-PAAG

Reference 3 : TLN WRO CAT: (i)DTV : TLN-WRO-TA-I-S-PDAA

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1 **Abstract**

This document describes the major DVB-C signaling building blocks an AO STB must have in order to be able to successfully interoperate with the DTV part of the TLN ROTV. Each required building block is briefly described explaining it's expected functional behavior.

This document has a corresponding certification document with reference: **TLN-WRO-TA-I-C-PAAC** which is used to test AO WO equipment compliance against this specification.

The feasibility of the technical designs and methods described in this document are subject to verification by a Proof of Concept (POC) test organized by Telenet and may be changed or updated depending on the outcome of this POC.

2 Glossary and Abbreviations

CA: Conditional Access
CAT: Conditional Access Table
DEMUX: De-multiplexer
EIT: Event Information Table
EPG: Electronic Program Guide
ETSI: European Telecommunications Standards Institute
MHP: Multimedia Home Platform
MPEG: Moving Picture Experts Group
MPTS: Multi-program Transport Stream
MUX: Multiplexer
NIT: Network Information Table
NIU: Network Interface Unit
PAT: Program Association Table
PMT: Program Map Table
PSI: Program Specific Information
QAM: Quadruple Amplitude Modulation
SC: Smartcard
SDT: Service Description Table
SI: Service Information

3 AO STB Digital Video Broadcast - Cable (DVB-C) signaling subsystem Functional Description

- (1) The AO-STB needs to be equipped with a DVB-C front-end module that allows “tuning” into DVB-C QAM modulated signals carrying TLN DTV signals. It consists of following major sub-components :
 - QAM tuner module
 - MPTS DEMUX module
 - DVB-C PSI/SI signalling decoding module
- (2) The above three modules make sure the STB application and middleware software can get access to the necessary signalling data that it requires to present the services to the TV viewer and act upon its input via the RCU.
- (3) As seen in the following figure, the DVB-C signaling structures consist of three main blocks. These provide Digital TV services “Table of contents” services such as: list of DTV transport Multiplexers, list of channels, language selection, Teletext, CA/Entitlement and Electronic program guide information.

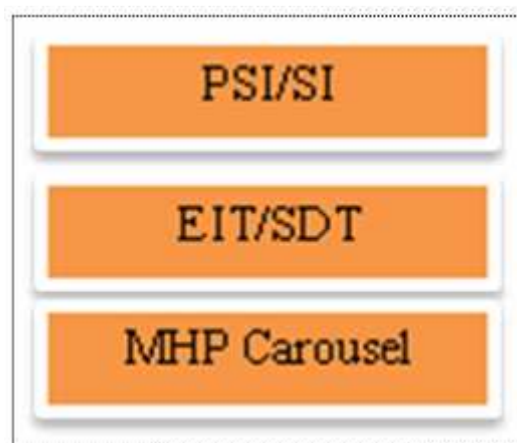


Figure 3-1

4 AO STB Digital Video Broadcast - Cable (DVB-C) signaling subsystem Functional Requirements

4.1 General

- (4) TLN provides read access to DVB-C signalling information (NIT, DVB-C Mux frequency map, DVB-C MUX service map,) in order to allow AO STB's to "tune" into the correct MUX and select the correct MPTS services for decoding by its STB/SC in function of its end-user channel selections.

4.2 DVB-C Normative References

4.2.1 General

- (5) Extensive standardization effort has been carried out by ETSI (standards) in order to create a well defined framework to enable broad interoperability for DVB compliant equipment (transmitters and receivers). This framework defines the performance expected of DVB compliant equipment, thereby supporting the technical choices that were made when defining the architecture and normative requirements (ETSI standards) of the DVB systems.
- (6) The Telenet digital TV implementation is DVB-C compliant, however TLN has made use of the possibility the DVB-C framework offers to extend it with private extra capabilities.

4.2.2 DVB-C normative references

- (7) In order to achieve compliance with the TLN ROTV specification set for DTV, it is necessary to conform to the mentioned DVB-C standards and other works as indicated, in addition to the other requirements of this specification. Notwithstanding, intellectual property rights and/or royalty fees may be required to use or implement such normative references.
- (8) The relevant DVB-C documents can be found at: <http://docbox.etsi.org/Reference>.

4.2.3 TLN DVB-C implementation specifics

- (9) TLN has extended the standard DVB-C specifications with a number of private signalling descriptors to create extra functionalities. Those extensions are documented in **TLN-WRO-TA-I-S-PAAG** which describes the signaling as it is generated by the TLN VHE.

4.3 TLN DVB-C signalling for AO STB

4.3.1 General

- (10) The TLN DVB-C signaling system is incorporated in the broadcast transmission streams of the digital television signals over the cable network. The base transmission system uses MPEG-2 or MPEG-4 family digital audio/digital video streams, amended with the accompanying signaling information transported in DVB-C multiplexers using a 256 or 64 QAM modulation with channel coding. The main signaling elements are explained in this paragraph.

4.3.2 NIT signalling structure

- (11) The NIT (Network Information Table) provides a grouping of Transport Streams and tuning information such as channel frequencies and modulation characteristics. The TLN DVB-C network transmits the NIT_actual on each transport stream of the DVB network and may transmit also NIT_other on one or more transport streams of the DVB-C network.
- (12) The NIT structure consists of frequency, symbol rate, modulation and polarization etc.

4.3.3 TLN DVB-C home channel

- (13) The TLN DVB-C network uses a “home MUX” that serves special status and provides services only available in this MUX like software upgrade services. Typically an STB will search for and tune into the “home MUX” as part of its boot and start-up procedure and will start the network structure discovery process from that entry point.

4.3.4 PSI/SI signalling tables

- (14) DVB Service information (SI) is an enhancement of MPEG PSI (Program Specific Information). It provides extra information which the receiver can use to ease the decoding process. The primary link between DVB SI and MPEG is the PSI in MPEG and is contained primarily in the PAT (Program Association Table), PMT (Program Map Table) and CAT (Conditional Access Table) set of tables.

4.3.5 EPG/EIT signalling

- (15) The EPG/EIT signalling information provides Digital TV “Table of contents” services such as CA/Entitlement, Electronic program guide information.

4.3.6 Software update and reboot

- (16) TLN provides signalling /transport support for AO STB’s initial configuration, boot, initial software download and software update services

4.4 AO Device Management by TLN Requirements

(17) The applicable requirements are described in [TLN-WRO-TA-I-S-PDAA](#).

5 AO STB - Non Functional Requirements

(18) The applicable requirements are described in [TLN-WRO-TA-I-S-PDAA](#).