



भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS

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**DRAFT IN
WIDE CIRCULATION**

Technical Committee: LITD 07

Document Dispatch Advice	
Ref	Date
LITD 07/T-149	16/03/2009

ADDRESSED TO:

1. All Members of Audio-Video and Multimedia Systems & Equipment Sectional Committee, LITD 07
2. All Principal Members of Electronics and Information Technology Division Council (LITDC)
3. Ministry of Information and Broadcasting
4. All others interested

Dear Madam/Sir(s),

Doc: LITC 07 (3140)

Title: DIGITAL SET TOP BOX FOR MPEG-4 DTH SERVICES – SPECIFICATION

Kindly examine these draft standard and forward your views stating any difficulties, which you are likely to experience in your business or profession, if this is finally adopted as National Standard.

Last Date for comments: 15/04/2009

Comments if any, may please be made in the format indicated and mailed to the undersigned at the above address. As decided in last LITD 07 meeting, in case no comments are received or comments received are of editorial nature, we may be kindly permitted us to presume your approval for the above document as finalized for publication as Indian Standard. However, in case of comments of technical in nature are received then the draft Standard may be finalized either in consultation with the Chairman of LITD 07 Sectional Committee or referred to the LITD 07 Sectional committee for further necessary action if so desired by the Chairman, LITD 07.

Thanking you,

Yours faithfully,

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Tele Fax: 23237093

Encl: As above



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व्यापक परिचालन मसौदा

तकनीकी समिति: एल आई टी डी 07

प्रलेख प्रेक्षण संज्ञापन	
संदर्भ	दिनांक
एलआई टी डी 07/टी -149	16 मार्च 2009

पाने वाले का नाम :

- 1) ऑडियो, वीडियो और मल्टीमीडिया उपस्कर प्रणाली विषय समिति एल आई टी डी 07
- 2) इलेक्ट्रॉनिकी एवं सूचना प्रौद्योगिकी विभाग परिषद के प्रधान सदस्य
- 3) सूचना एवं प्रसारण मंत्रालय
- 4) रूचि रखने वाले अन्य सदस्य

महोदय(यों),

निम्नलिखित प्रलेख संलग्न है ।

प्रलेख संख्या : एल आई टी डी 07 (3140)

शीर्षक : एमपेग -4 डी टी एच सेवाओं के डिजिटल सेट टाप बॉक्स - विशिष्टि

कृपया इन मसौदों का अवलोकन करें और अपनी समितियाँ यह बताते हुए कि यदि यह भारतीय मानक प्रकाशित हों तो अमल करने में आप के व्यवसाय अथवा कारोबार में क्या कठिनाईयाँ आ सकती हैं । समिति यदि कोई हो तो कृपया अधोहस्ताक्षरी को उपरिलिखित पते पर संलग्न फॉर्मेट में भेज दें ।

सम्मतियाँ भेजने की अंतिम तिथि 15-04-2009

धन्यवाद ।

भवदीय

प्रमुख (इलेक्ट्रॉनिकी व आई टी)

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संलग्नक : उपरोक्त

BUREAU OF INDIAN STANDARDS
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Draft Indian Standard

DIGITAL SET TOP BOX FOR MPEG-4 DTH SERVICES – SPECIFICATION

Last date of receipt of comments is 15-04-2009

NATIONAL FOREWORD

(Formal clauses will be added later)

This Indian Standard will be adopted by the Bureau of Indian Standards, after the draft would be finalized by the Audio-Video and Multimedia Systems & Equipment Sectional Committee, LITD 07 and approved by the Electronics and Information Technology Division Council (LITDC)

There is no ISO/IEC Standard on this subject.

CROSS REFERENCES

The concerned Technical Committee responsible for the preparation of this standard has reviewed the provisions of the following International Standard and has decided they are acceptable for use in conjunction with this standard.

ISO/IEC 13818 -1	"Information technology - Generic coding of moving pictures and associated audio information" Part 1: Systems
ISO/IEC 13818-2:2000	'Information technology - Generic coding of moving pictures and associated audio information Part 2 Video Coding'
ISO/IEC 14496-3 :2005	'Information technology - Coding of audio-visual objects : Part 3 Audio'
ISO/IEC 14496-10 :2008	Information technology - Coding of audio -visual objects : Part 10 Advanced Video Coding'
ISO / IEC 7816 (all Parts)	Specifications for smart cards.
ETSI EN 300 421 (V.1.1.2)	"Digital Video Broadcasting (DVB); Framing structure, channel coding and modulation for 11/12 GHz satellite services".
ETSI TS 101 154 V1.8.1	"Digital Video Broadcasting (DVB); Specification for the use of Video and Audio Coding in Broadcasting Applications based on the MPEG-2 Transport Stream."
ETSI EN 301 192 V1.4.1	"Digital Video Broadcasting (DVB); DVB specification for data broadcasting".
TR 101 202	" Specification for data broadcasting : Guidelines for the use of EN 301 192".

ETR 289 V1	“Support for use of scrambling and Conditional Access (CA) within digital broadcasting systems”
EN 50221 V1	“Common Interface Specification for Conditional Access and other Digital Video Broadcasting Decoder Applications”
TS 101 699 V1.1.1	Extensions to the Common Interface Specification
TS 102 006 V1.3.1	Specification for System Software Update in DVB Systems
EN 302 307 V1.1.2	Second generation framing structure, channel coding and modulation systems for Broadcasting, Interactive Services, News Gathering and other broadband satellite applications
TR 102 376 V1.1.1	User guidelines for the second generation system for Broadcasting, Interactive Services, News Gathering and other broadband satellite applications
ETSI EN 300 468 V1.7.1	Specifications for Service Information(SI) in DVB systems
TR 101 211 V1.7.1	Guidelines on implementation and usage of Service Information (SI) in DVB systems.
ETSI EN 300 743 V1.3.1	Subtitling Systems .
TS 102 201	Interfaces for DVB IRDs

Draft Indian Standard.
Doc. No. LITD 07 (3140)

DIGITAL SET TOP BOX FOR MPEG-4 DTH SERVICES – SPECIFICATION

1 SCOPE

This Standard specifies the requirements for a Digital Set Top Box (STB) for MPEG-4 Compression for DVB-S Transmission used by subscribers to receive multichannel television programmes transmitted using a satellite system direct to subscriber premises without passing through an intermediary such as a cable operator.

2 REFERENCES

The Standards listed in Annex A contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 REQUIREMENTS

3.1 General requirements

3.1.1 The STB shall be based on an open architecture (non proprietary) and shall ensure technical compatibility and effective interoperability amongst different DTH service providers in the country. The interoperability shall be achieved by using common interface conforming to EN 50221 “Common interface specification for conditional access and other digital video broadcast decoder applications” including “TS 101699 Extensions” to DVB-CI specification. and via software download where the software download mechanism shall be transparent, interoperable and available in the public domain complying with ETSI TS 102006. The STB shall have at least one common interface slot complying to EN 50221.

3.1.2 The manufacturer shall ensure compatibility/interfaces with consumer electronic equipments such as televisions, audio and video systems and VCRs etc in the country.

3.1.3 Specifications

Clause	Specification	Mandatory	Optional
3.1.3.0	Satellite Reception	Multiple Satellites and multiple transponder support. Supports: 1) DiSEqC 1.0, DiSEqC 1.2 and 2) 13/18 V and 0/22 KHz tone	Supports DiSEqC 2.0

3.1.3.1	Demodulation and Forward Error Correction (FEC) Decoding	Capability to demodulate and decode DTH signals channel coded and modulated in accordance with the DVB-S standard (EN 300421)	Capability to demodulate and decode DTH signals channel coded and modulated in accordance with the DVB-S 2 standard (EN 302307) Should be capable of receiving signals emitted using following modes: 1. Backward compatible mode. 2. Non backward compatible mode 3. Constant Coding and Modulation (CCM). 4. Variable Coding and Modulation (VCM).
3.1.3.2	Decompression /Decoding -Video	The STB should be capable of decompressing and decoding video signals in accordance with: 1) ISO/IEC 14496-10 :2008 'Information technology - Coding of audio -visual objects : Part 10 Advanced Video Coding' :Main Profile at level 3 2) ISO/ IEC 13818-2:2000 'Information technology - Generic coding of moving pictures and associated audio information Part 2 Video Coding' (including amendment 1 issued in 2001 and amendment 2 issued in 2007): Main Profile at Main level.	The STB should be capable of decompressing and decoding video signals in accordance with: 1) ISO/IEC 14496-10 :2008 'Information technology - Coding of audio -visual objects : Part 10 Advanced Video Coding' :High Profile at Level 4 2) Capable of decoding Scalable video coding as per Annex G of ISO/IEC 14496-10 :2008 'Information technology - Coding of audio -visual objects : Part 10 Advanced Video Coding' 3) ISO/ IEC 13818-2:2000 'Information technology - Generic coding of moving pictures and associated audio information Part 2 Video Coding' (including amendment 1 issued in 2001 and amendment 2 issued in 2007): Main Profile at High Level.
3.1.3.3	Decompression /Decoding -Audio	Capability to decompress/decode Audio compressed in accordance to ISO/ IEC 11172-3:1993 'Information technology - Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s : Part 3 Audio': MPEG-1 Audio Layer II .	Capability to decompress/decode Audio compressed in accordance to: 1. Audio Coding 3 (AC3) 2. Enhanced AC3 3. ISO/IEC 14496-3 :2005 'Information technology - Coding of audio-visual objects : Part 3 Audio'(including amendment 1 issued in 2007, amendment 2 issued in 2006, amendment 3 issued in 2006 and amendment 5 issued in 2007) 4. Digital Theater System

3.1.3.4	Data Services	Capability to receive and process Data streams compliant to EN 301192 and TR 101202	
3.1.3.5	Subtitle streams	Capability to receive and process Subtitle streams compliant to EN 300 743	
3.1.3.6	Service Demulti-plexing	Capability to receive and process SI (Service Information) as laid down in EN 300 468 & TR 101211	
3.1.3.7	Conditional Access / Scrambling	1) Capability to descramble services scrambled in accordance with DVB-CSA (ETR 289) including decryption of signals which have been SimulCrypt in accordance with ETSI TS 103 197. 2) STB may have provision for smart card operation. If smart card is provided it shall be in accordance with IS 14202 (Parts1,2&3) and should be connected via a DVB-CI compliant interface as per EN 50221and TS 101699.	
3.1.3.8	Upstream Communication		“Bidirectional interactive services may be deployed through the return channel”
3.1.3.9	Interfaces/ Connectors	1. Satellite Input - 75 ohms impedance, Female connector (as per IEC 60169 -24) 2. Output Video – RCA type (Yellow) 3. Output Audio Mono (Mandatory) RCA type Stereo (Optional) RCA type (L- White, R-Red) 4. DVB-CI (Common Interface) as per EN 50221 & TS 101699	1. RF Output- 75 ohms impedance, male connector (as per IEC 60169-2) 2. HDMI, As specified in TS 102201 3. USB 2.0 Ports 4. RF Input (Loop through) 75 ohms impedance, female connector (as per IEC 60169 -24) 5. RJ 11 (for PSTN modem) 6. RJ45 for Ethernet connection 7. Digital Audio connector (RCA type black) 8. SPDIF 9. Optical Fibre 10. Coaxial Cable

3.1.3. .10	Software updatation mechanism	As per TS 102 006	RS 232C port for uploading control software and additional service.
3.1.3. .11	PVR Functionality		The PVR functionality: This may be provided as an option enabling the recording of live A/V programs to the STB hard drive and the ability to play back video with VCR like controls.

3.2 Performance Requirements

The requirements for various performance parameters for the STB shall be as given in Table 1.

3.3 Safety Requirements

The safety requirements of Receiver shall conform to IS 13252.

3.4 Electromagnetic Compatibility (EMC) Requirements

The EMC requirements of the STB shall conform to IS 6873(Part3).

4. MARKING

4.1 Each STB shall be legibly and indelibly marked with at least the following information:

- a) Manufacturer's name or trade mark(if any);
- b) Model designation and Serial No.;
- c) Country of manufacture;
- d) Input supply voltage and frequency;
- e) Power consumption ;
- f) Satellite input terminal and Satellite output terminal; and
- g) All Connectors

4.2 BIS Certification Marking

The STB may also be marked with the Standard Mark.

4.2.1 The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulation made there under. Details of conditions under which a license for the use of Standard Mark may be granted to manufacturers and producers may be obtained from the Bureau of Indian Standards.

5 ENVIRONMENTAL TESTS

5.1 Bump Test

The STB shall be subjected to bump test carried out in accordance with IS 9000(Part 7/Sec 2), the number of bumps being 500+10 and acceleration being 400m/s². After this test the Receiver shall conform to the performance requirements specified in 5.6. This test shall be carried out under packed condition.

5.2 Drop Test

The STB shall withstand drop test as given in IS 13252. After this test the STB shall conform to the performance requirements specified in 5.6.

5.3 Dry Heat Test

The STB shall be subjected to dry heat test of severity + 55oC for 16 hours, carried out in accordance with IS 9000 (Part 3/Sec 5). After recovery, the STB shall conform to the performance requirements specified in 5.6. The duration of the recovery shall be 2 hours.

5.4 Damp Heat Test

The STB shall be subjected to damp heat cyclic test in accordance with IS 9000 (Part 5/Sec 1). After recovery the STB shall conform to the performance requirements specified in 5.6. The duration of the recovery shall be 24 hours.

5.5 Cold test

The STB shall withstand, a cold test of severity – 10oC for 2 hours carried out in accordance with IS 9000(Part 2/Sec 4). After recovery, the Receiver shall conform to the performance requirements specified in 5.6. The duration of the recovery shall be 2 hours.

5.6 Post measurement after each environmental test

After each environmental test (5.1 to 5.5), the STB shall meet the safety requirements of 3.3 and the requirements specified in Table 1 for the following parameters:

- a) RF output level [S1 No. 5 (c) of Table 1], (Optional Requirement)
- b) Carrier to noise ratio [S1 No. 5 (d) of Table 1], (Optional Requirement)
- c) Reception of service

6. OPERATING LIFE TEST

The STB shall be subjected to operating life test consisting of 5 hours operation and one hour rest period for a total operating period of 1000 hours at rated voltage and at ambient temperature. At the end of the operating life duration, the requirements specified in 3.3 and Table 1 shall be met with.

**Table -1 Performance Requirements
(Clauses 3.2, 5.6 and 6)**

Sl.No.	Specifications / Parameters	Mandatory Values	Optional
1.	Electrical specifications a) Input voltage range b) Frequency	a) 90-270 V AC b) 50 Hz + 2%	
2	RF characteristics to be supported by the Receiver	As per DVB-S standard Ref :3.1.3.1	As per DVB-S2 depending upon selected operation mode Ref :3.1.3.1
3	LNBF Control	The STB shall have provisions to provide proper power supply and switching signal for oscillator selection and polarization selection for LNB	
4	STB tuner performance characteristics a) Input level per carrier b) Input frequency range c) Symbol Rate d) RF input impedance e) RF input return loss	a) -65dBm(min) to -25dBm(max) b) 950 to 2 150 MHz c) 2 – 45 M Symbols/Sec. d) 75 Ohms. e) 8 dB, Min.	As per DVB-S2 depending upon selected operation mode Ref :3.1.3.1
5	RF re-modulator output a) Modulation Format b) RF output channel c) RF output level d) Carrier to noise ratio		a) PAL B(for VHF) or PAL G(for UHF) b) VHF Channel 3/4 or Agile/UHF c) 60 dB μ V Min to 80 dB μ V Max Method of tests :4.7 of IS 13420 (Pt 1) d) 44 dB Min Method of tests :4.5 of IS 13420 (Pt 1)
6	Remote control	Mandatory	
7	Operating ambient temperature range	5°C to 50°C	
8	Operating humidity range	5% to 95% (non-condensing)	
9	Finger printing	Mandatory: but service provider free to choose mechanism	

Annex A
(Clause 2.1)

LIST OF REFERRED INDIAN STANDARDS

IS NO.	Title
6873(Part 3):1999	Limits and methods of measurement of radio disturbance characteristics: Part 3 Sound and television broadcast receivers and associated equipment (first revision)
9000(Part 2/Sec 4):1977	Basic environmental testing procedures for electronic and electrical items: Part 2 Cold test, Section 4 Cold test for heat dissipating items with gradual change of temperature
9000 (Part 3/Sec 5): 1977	Basic environmental testing procedures for electronic and electrical items: Part 3 Dry heat test, Section 5 Dry heat test for heat dissipating items with gradual change of temperature
9000 (Part 5/Sec 1): 1981	Basic environmental testing procedures for electronic and electrical items: Part 5 Damp heat cyclic test, Section 1 16 + 8 h cycle
9000(Part 7/Sec 2):1979	Basic environmental testing procedures for electronic and electrical items: Part 7 Impact test, Section 2 Bump
13252:1992	Safety of information technology equipment including electrical business equipment
13420 (Part 1):2002	Cabled distribution systems: Part 1 Methods of measurement and system performance