

# Indian Standard

## DIGITAL SET TOP BOX FOR DIRECT-TO-HOME (DTH) SERVICES – SPECIFICATION

© BIS 2003  
BUREAU OF INDIAN STANDARDS  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI-110002

## **FOREWORD**

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Radio-communication Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

There is no ISO/IEC Standard on this subject.

The Committee responsible for the formulation of this standard has reviewed the provisions of the following international publications and has decided that these may be used in conjunction with this standard till Indian Standards on these subjects are published:

IEC 60169-2 (1965) Radio frequency connectors: Part 2 Coaxial unmatched connectors (including Amendment No. 1 (1982))

IEC 6069-24 (1991) Radio-frequency connectors: Part 24 Radio-frequency coaxial connectors with screw coupling, typically for use in 75 ohm cable distribution systems (Type F)

EN 50221 Common interface specification for conditional access and other digital video broadcast decoder applications.

EN 300421 Digital video broadcasting (DVB); Framing structure, channel coding and modulation for 11/12 GHz satellite services.

EN 300468 Digital video broadcasting (DVB); Specification for service information (SI) in DVB systems.

EN 301192 Digital video broadcasting (DVB); Specification for data broadcasting.

EN 301195 Digital video broadcasting (DVB); Interaction channel through the global system for mobile communications (GSM).

EN 301790 Digital video broadcasting (DVB); Interaction channel for satellite distribution systems.

ETR 211 Digital broadcasting systems for television: Guidelines on implementation and usage of service information (SI) in DVB systems.

ETR 289 Digital video broadcasting (DVB); Support for use of scrambling and conditional access (CA) within digital broadcasting systems.

ETR 300801 Digital video broadcasting (DVB); Interaction channel through public switched telecommunication network (PSTN)/integrated services networks (ISDN).

ETSI TR 101202 289 Digital video broadcasting (DVB); Implementation guidelines for data broadcasting.

ETSI TR 102006 Digital video broadcasting (DVB); Specification for system software update in DVB systems.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (revised)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

## **Indian Standard**

# **DIGITAL SET TOP BOX FOR DIRECT-TO-HOME (DTH) SERVICES –SPECIFICATION**

## **1 SCOPE**

This standard specifies the requirements for digital set top box (STB) used by subscriber to view multichannel television programmes in ku band by using a satellite system by providing television signals direct to subscribers premises without passing through an intermediary such as 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 open architecture (non-proprietary) and shall ensure technical compatibility and effective interoperability among different DTH service providers in the country. The interoperability shall be achieved by using common interface complying to EN 50221 'Common interface specification for conditional access and other digital video broadcast decoder applications' and via software download where the software download mechanism shall be transparent, interoperable and available in public domain complying with specification ETSI TS 102006. The STB must have at least one common interface slot complying to EN 50221.

3.1.2 The manufacturer shall ensure compatibility/ interfacing of STB with consumer electronic equipment such as televisions, audio system and VCRs, etc, in the country.

#### **3.1.3 Forward Path**

The STB shall support reception and processing of DVB-S (EN 300421) compliant digitally modulated signal. It shall be able to receive and process service information (SI) as laid down in EN 300468 and ETR 211. for data services (if implemented), it shall be able to receive data bit streams compliant to EN 301192 and ETSI TR 101202.

#### **3.1.4 Return Path**

For interactive applications, the STB may have the provisions of processing signal on return path, if the service for return path is provided by the service provider. The return path signal may be in accordance with ETS 300801 for interaction through PSTN and ISDN, with EN 301195 for interaction through GSM mobile services or with EN 301790 for interaction through satellite.

### **3.15 conditional Access/Scrambling**

the conditional access system/scrambling shall conform to DVB-S (EN 300421) and DVB-CSA (ETR-289).

### **3.1.6 Smart Card**

The STB may have provision for smart card operation. If smart card is provided, it shall be in accordance with IS 14202 (Parts 1,2 and 3)

## **3.2 Performance Requirements**

The requirements for various performance parameters for digital set top box shall be as given in Table 1.

## **3.3 Safety Requirements**

The safety requirements of set top box shall conform to IS 13252

## **3.4 Electromagnetic Compatibility (EMC) requirements**

The EMC requirements of the STB shall conform to IS 6873 (Part 3)

# **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) Mode 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) Sockets for audio and video output.

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

Sl. No.	Parameters	Requirements	Method of Tests
(1)	(2)	(3)	(4)
i.	Electrical specification:		
	a) Input voltage range	90-270 V AC	
	b) Frequency	50 Hz $\pm$ 5 percent	
ii.	Connectors:		
	a) Satellite input	75 ohms impedance, female connector (as per IEC 60169-24)	
	b) Output video	1 X RCA type	
	c) Output audio (L and R)	2 X RCA type	
	d) RF output	75 ohms impedance, male connector (as per IEC 60169-2)	
	e) Telephone line	Optional: RJ 11	
iii.	RF characteristics of the DTH signal:		
	a) System	DVB-S (Complaint to EN 3000421)	
	b) Modulation	QPSK	
	c) Carrier to noise ratio	Complaint to DVB-S	
iv.	LNB control	STB shall have provisions to provide proper power supply and switching signal for oscillator selection and polarization selection for LNB	
v.	Channel turner performance characteristics:		
	a) Input level per carrier	-65 dBm, Min -25 dBm, Max	
	b) Input frequency range	950 MHz to 2 150 MHz	-
	c) Symbol rate	Compliant to DVB-S	-
	d) RF input impedance	75 ohms	-
	e) RF input return loss	6 dB, Min	-
	f) Frequency assignment download	Optional	
vi.	RF re-modulator output:		
	a) Modulation format	PAL B (for VHF) or PAL G (for UHF)	
	b) RF output channel	VHF Channel $\frac{3}{4}$ or Agile/UHF	

	c) RF output channel	-60 DB $\mu$ V.Min.	4.7 of IS 13420 (Part I)
		-80 dB $\mu$ V Max	4.5 of IS 13420 (Part I)
	d) Carrier to noise ratio	44 dB, Min	
vii.	Remote control	Optional	
viii.	PSTN modem/ISDN codee	Optional	
ix.	Operating temperature range	0 <sup>0</sup> C to 50 <sup>0</sup> C	
x.	Operating humidity range	5 percent to 95 percent (non-condensing)	
xi.	Finger printing	Essential but service provider free to choose mechanism	

---

## 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 thereunder. Details of conditions under which a licence for the use of the 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  $500 \pm 10$  and acceleration being 400 m/s<sup>2</sup>. After this test the STB 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 +55<sup>0</sup>C for 16 h 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 h.

### 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 h.

### **5.5 Cold Test**

The STB shall withstand, a cold test of severity- 10<sup>0</sup>C for 2 h carried out in accordance with IS 9000(Part 2/Sec 4). After recovery, the STB shall conform to the performance requirements specified in 5.6. The duration of the recovery shall be 2 h.

### **5.6 Post-Measurement after each Environmental Test**

After each environmental test (see 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 [SI No. (vi) (c) of Table 1
- (b) Carrier to noise ratio [SI No. (vi) (d) Table 1], and
- (c) Reception of authorized service.

## **6 OPERATING LIFE TEST**

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

### **ANNEXE A**

(Clause 2)

#### **LIST OF REFERRED INDIAN STANDARDS**

Title

6873 (Part 3) 1999	Limits and method of measurement of radio disturbance characteristics: part 3 Sound and television broadcast receivers associated equipment (first revision)
9000	Basic environmental testing procedures for electronic and electrical items:
(Part 2/Sec 4)1977	Cold test, Section 4 Cold test for heat dissipating items with gradual change of temperature.
(Part 3/Sec 5)1977	Dry heat test, Section 5 Dry heat test for heat dissipating items with gradual change of temperature
(Part 5/Sec) 1981	Damp heat cyclic test, Section 1 16+8 h cycle



(Part 7/Sec 2)1979	Impact test, Section 2 Bump
13252: 2003	Safety of information technology equipment including electrical business equipment (first revision)
13420(Part 1): 2002	Cabled distributions systems: Part 1 Methods of measurement and system performance (Second revision)
14202	Identification cards - Integrated circuit(s) – Cards with contacts:
(Part 1): 2003	Physical characteristics (first revision)
(Part 2): 2003	Dimensions and location of the contacts (first revision)
(Part 3): 2002	Electronic signals and transmission protocols

### **Bureau of Indian Standards**

BIS is a statutory institution established under the Bureau of Indian Standards Act, 1986 to promote harmonious development of the activities of standardization Marketing and quality certification of goods and attending to connected matters in the country.

### **Copyright**

Enquiries relating to copyright be addressed to the Director (Publications), BIS. BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations.

### **Review of Indian Standards**

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically: a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'standards: Monthly Additions'.

This Indian Standard has been developed from Doc: No. TD 20 (2003)

### Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

### BUREAU OF INDIAN STANDARDS

#### Headquarters:

Manak Bhavan, 9 Bhadur Shah Zafar Marg, New Delhi 110002  
Telegrams:Manaksansthan (Common to all offices)  
Telephone No. 2323 0131, 2323 3375, 2323 9402

#### Regional Offices:

- Central        Manak Bhavan, 9 Bhadur Shah Zafar Marg  
New Delhi 110002  
Telephone No. 2323 7617, 2323 3841
- Eastern        1/14 C.I.T. Scheme VII M, V.I.P. Road Kankurgachi  
KOLKATA 700054  
Telephone No. {2337 8499, 2337 8561, 2337 8626, 2337 9120}
- Northern        SCO 335-336, Sector 34-A, CHANDIGARH 160022  
Telephone No. {603843, 609285}
- Southern        C.I.T. Campus, IV Cross Raod, Chennai 600 113  
Telephone No. {22541216, 22541442, 22542519, 22542315}
- Western        Manakalaya, E9 MIDC, Marol, Andheri (East)  
MUMBAI 400093  
Telephone No. {28329295, 28327858, 28327891, 28327892}
- Branches        AMHMEDABAD, BANGLORE, BHOPAL, BHUBNESHWAR,  
COIMBATORE, FARIDABAD, GHAZIABAD, GUWAHATI,  
HYDERABAD, JAIPUR, KANPUR, LUCKNOW, NAGPUR,  
NALAGARH, PATNA, PUNE, RAJKOT, THIRUVANANTHAPURAM,  
VISAKHAPATNAM.