

भारतीय मानक
एनालोग सैट टॉप बॉक्स — विशिष्टि

Indian Standard
ANALOG SET TOP BOX — SPECIFICATION

ICS 33.060.40

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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FOREWORD

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

There is no ISO/IEC standard on this subject.

The technical Committee responsible for the formulation of this standard has reviewed the provisions of the following IEC Publication and has decided that it may be used in conjunction with this standard till Indian Standard on this subject is published:

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

The composition of the Committee responsible for formulation of this standard is given in Annex B.

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

ANALOG SET TOP BOX — SPECIFICATION

1 SCOPE

This standard specifies the requirements for analog set top box (STB) used by subscriber for viewing pay channels through cabled distribution system.

2 REFERENCES

The Indian 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.

3 REQUIREMENTS

3.1 General Requirements

3.1.1 The manufacturer/service provider shall declare to the subscriber the capability of STB and its interoperability on various networks in the instruction manual to be supplied with the STB.

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 cable TV signals provided by the service provider in accordance with IS 13420 (Part 1).

3.1.4 Return Path

For interactive applications, the STB may have the provision 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 IS 14231 (Part 8) or any other International Standard.

3.1.5 Conditional Access/Scrambling

The manufacturer/service provider may specify conditional access system for the STB.

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).

3.1.7 Subscriber Management System (SMS)

The service provider may opt for any SMS but it shall

ensure consumer interest by efficient, responsive and accurate billing and collection. At the same time an arrangement must be made between the broadcaster and service provider for access to relevant data related to the respective channels for billing purpose, etc.

3.2 Performance Requirements

The requirements for various performance parameters for analog 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) Model designation and serial No.;
- c) Country of manufacture;
- d) Input supply voltage and frequency;
- e) Power consumption;
- f) RF input terminal and RF output terminal; and
- g) Sockets for audio and video output.

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. The 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 ± 10 and acceleration being 400 m/s^2 . After this test the STB shall conform to the

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

SI No. (1)	Parameters (2)	Requirements (3)	Method of Tests, Ref to Cl of IS (4)
i)	Electrical specifications:		
	a) Input voltage range	90-270 V AC	-
	b) Frequency	50 Hz \pm 5 percent	-
ii)	Bypass of analog free to air RF signal	The STB shall have the capability of bypassing free to air RF signal	-
iii)	Connectors:		
	a) RF input	75 ohms impedance, female connector (as per IEC 60169 -2)	-
	b) Output video	1 X RCA type	-
	c) Output audio (L and R)	2 X RCA type	-
	d) RF output	75 ohms impedance, female connector (as per IEC 60169 -2)	-
iv)	RF characteristics at cable system outlet:		
	a) System	PAL B (for VHF), PAL G (for UHF)	-
	b) Modulation	AM-VSB	-
	c) RF carrier signal level	60 dB μ V, <i>Min</i> 57dB μ V, <i>Min</i> for systems with 8 MHz 80 dB μ V, <i>Max</i> 77 dB μ V, <i>Max</i> for > 20 channels	4.7 of IS 13420 (Part 1)
	d) Carrier level differences between distributed TV channels (47 to 862 MHz range)	12 dB, <i>Max</i>	4.7 of IS 13420 (Part 1)
	e) Carrier level differences between AM-VSB and 64 QAM digital signal adjacent channel	13 dB, <i>Max</i> (64 QAM signal must be below the level of adjacent AM-VSB channel)	4.10.3 of IS 13420 (Part 1)
	f) Amplitude response within a TV channel	Variation (pp): 2 dB, <i>Max</i> Slope of variation : 1 dB/MHz, <i>Max</i>	4.2 of IS 13420 (Part 1)
	g) Lowest carrier to interference ratio	57 dB, <i>Min</i>	-
	h) Cross modulation	> 46 + 10 lg (N-1), N = Number of channels	-
v)	Channel tuner performance characteristics:		
	a) RF input level	Same as mentioned in RF characteristics at cable system outlet in (iv)	-
	b) Input frequency range	47 to 862 MHz	-
	c) RF input channel bandwidth	7 MHz	-
	d) RF input impedance	75 ohms	-
	e) RF input return loss	6 dB, <i>Min</i>	-
	f) Frequency assignment download	Optional	4.1.1 of IS 14231 (Part 3)
vi)	RF re-modulator output:		
	a) Modulation format	PAL B (for VHF); PAL G (for UHF)	-
	b) RF output channel	VHF Channel 3/4; Agile/UHF	-
	c) RF output level	60 dB μ V, <i>Min</i> 80 dB μ V, <i>Max</i> 44 dB, <i>Min</i>	4.7 of IS 13420 (Part 1) 4.5 of IS 13420 (Part 1)
vii)	Remote control	Optional	-
viii)	Operating temperature range	0°C to 50°C	-
ix)	Operating humidity range	5 percent to 95 percent (non-condensing)	-
x)	Finger printing	Essential but manufacturer/service provider free to choose mechanism	-

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°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°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) Bypass of free to air RF signal [*see* SI No. (ii) of Table 1]
- b) RF output level [*see* SI No. (vi) (c) of Table 1], and
- c) Carrier to noise ratio [*see* SI No. (vi) (d) of Table 1].

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 1 000 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.

ANNEX A

(Clause 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	Title	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 (<i>first revision</i>)	13420 (Part 1) : 2002	equipment including electrical business equipment Cabled distribution systems: Part 1 Methods of measurement and system performance (<i>second revision</i>)
9000 (Part 2/Sec 4) : 1977	Basic environmental testing procedures for electronic and electrical items: Cold test, Section 4 Cold test for heat dissipating items with gradual change of temperature	14202 (Part 1) : 1995 (Part 2) : 1995	Identification cards – Integrated circuits – Cards with contacts: Physical characteristics Dimensions and location of the contacts
(Part 3/Sec 5) : 1977	Dry heat test, Section 5 Dry heat test for heat dissipating items with gradual change of temperature	(Part 3) : 2002	Electronic signals and transmission protocols
(Part 5/Sec 1) : 1981	Damp heat cyclic test, Section 1 16 + 8 h cycle	14231 (Part 3) : 1995	Cabled distribution systems for television and sound signals — Specification: Part 3 Active coaxial wideband distribution components
(Part 7/Sec 2) : 1979	Impact test, Section 2 Bump test	(Part 8) : 2002	System performance of return path
13252 : 1992	Safety of information technology		

ANNEX B

(Foreword)

COMMITTEE COMPOSITION

Radiocommunication Sectional Committee, LTD 20

<i>Organization</i>	<i>Representative(s)</i>
All India Radio, New Delhi	SHRI K. M. PAUL (<i>Chairman</i>) SHRI A. K. BHATNAGAR (<i>Alternate</i>)
Ahuja Radios, New Delhi	SHRI S. J. KALRA
Bharat Electronics Ltd, Bangalore	SHRI D. MURLIDHARAN SHRI SAMEER VERMA (<i>Alternate</i>)
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Consumer Electronics TV Manufacturers Association (CETMA), New Delhi	REPRESENTATIVE
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Department of Information Technology (STQC), New Delhi	REPRESENTATIVE
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Telecom Engineering Centre, Department of Telecommunication, New Delhi	SHRI ASHOK KUMAR SHRI ARUN AGARWAL (<i>Alternate</i>)
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BIS Directorate General	SHRI VIJAI, Director & Head (LTD) [Representing Director General (<i>Ex-officio</i>)]

Member Secretary
SHRIMATI REENA GARG
Deputy Director (LTD), BIS

(Continued on page 5)

(Continued from page 4)

Panel for Cabled Distribution System, LTD 20/P7

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Amendments Issued Since Publication

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