

Indian Standard

ANALOG SET TOP BOX –
SPECIFICATION

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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 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.

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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/interfaces 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 I).

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 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 $+55^{\circ}\text{C}$ 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 2h

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 SL No. (vi) © of Table 1], and
- c) Carrier to noise ratio [see SI No. (vi) (d) of Table].

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

ANNEX A

Clause 2 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	Basic environmental testing procedures for electronic and electrical items:
(Part 2/Sec 4)	Cold Test Section 4 test for heat test for heat dissipating items with gradual change of temperature
(Part3/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 cycle test, Section 1 16+8 h cycle
(Part 7/Sec 2): 1979	Impact test, Section 2 Bump
13252 : 1992	Safety of information technology equipment electrical business equipment.
13420 (Part 1): 2002	Methods of measurement and system performance (second revision)
14202	Identification cards – Integrated circuits- Cards with contacts:
(Part 1): 1995	Physical characteristics
(Part 2): 1995	Dimensions and location of this contacts
(Part 3): 2002	Electronic signals and transmission protocols
4231	Cabled distribution systems for television and sound signals – specifications:
(Part 3): 1995	Part 3 Active coaxial wideband distribution components
(Part 8) : 2002	System performance of return path

ANNEX B

(Foreword)

COMMITTEE COMPOSITION

Radio communication Sectional Committee, LTD 20

Organization	Representative (s)
All India Radio, New Delhi	Shri K.M Paul (Chairman) Shri A.K. Bhatnagar(Alternate)
Ahuja Radios, New Delhi	Shri S.J Kalra

Bharat Electronics Ltd, Bangalore	Shri D. Murlidharan Shri Sameer Verma(Alternate)
Central Electronics Engg Research Institute, Pilani.	Shri S. Raghunath & Shri Parmila Dhar (Alternate)
Consumer Electronics TV Manufacturers Association(CETMA), New Delhi	Representative
Directorate of Co-ordination (Police wireless), New Delhi)	Shri K.C. Agnihotri & Shri A.K. Gupta(Alternate)
Department of Information Technology(STQC), New Delhi	Representative
Development Commissioner Small Scale Industries, New Delhi.	Shri P.P. Malhotra & Shri Satya pal (Alternate)
Directorate General Doordarshan, New Delhi	Shri R.K. Gupta & Shri R.K. Jain(Alternate)
Directorate General of Supplies and Disposals, New Delhi	Shri Anil Gupta & Shri H.R. Sharma (Alternate)
Electronic Component Industries Association, New Delhi	Dr. R.K. Sarma & M.V. Kesavan (Alternate)
Electronics Corporation of India Ltd, Hyderabad	Shri P.A. Ramani & Shri K. Janardhan(Alternate)
Institute of Electronics and Telecommunication Engineers, New Delhi	Mai—Gen Yeshwant deva & Mai-Gen K.B JhalDtyal (alternate)
ITI Ltd, Bangalore	Shri C.S. BILAGI& Shri Jagatheesan (Alternate)
Ministry of Communication (WPC), New Delhi	Dr. Ashok Chandra & Dr. S.M. Sharma(Alternate)
Ministry of Defence, DGAQA, Ghaziabad	Shri Pratap Kumar & Shri B. Harinath (Alternate)
Ministry of Defence DGQA, Bangalore	Shri S.G. Joshi & Lr. Col R.S. Tripathi (Alternate)
Ministry of Defence DQA(N), New Delhi	Lt Cdr G. Ram& Shri J.K. Chanddna (Alternate)
National Physical Laboratory, New Delhi	Shri S.C. Garg & Shrimati D.R. Lakshmi (alternate)
Oil & Natural Commission, Mumbai	Shri G.S. Momi & Shri R.K. Settu(Alternate)
Research Design & Standards Organization Lukhnow	Shri Prosun Banarji
Telecom Engineering Centre, Department of Telecommunication, New Delhi	Shri Ashok Kumar & Shri Arun Aggarwal (Alternate)
Videsh Sanchar Nigam Ltd, Mumbai	Representative
BIS Directorate General	Shri Vuai Director & Head (LTD) [Representing Director General (Ex-officer)]

**Member Secretary
Shrimati Reena Garg**

Deputy Director(LTD), BIS

Panel for cable Distribution System. LTD 20/P7	
Organization	Representative (s)
In personal capacity (291 MFG flats. Prasad Nagar. New Delhi)	Shri M.M. Astilana (Convener)
Cable Operators Federation of India(COFI), New Delhi	Lr. Col K.K. Sharma
Canal-Plus Technologies Ltd, Mumbai	Shri Nicolas Andrieu (Alternate)
Catvision Products Ltd, Noida	Shri Attar Abbas – Shri Rajesh Kher (Alternate)
Central Electronic Engg Research Institute, Pilani	Shri S. Raghunath – Shrimati Parmita Dhar (Alternate)
Consumer Electronic TV Manufacturers Association (CEMTA), New Delhi	Shri Sanjeev Kumar – Shri Sanjeev (Alternate)
Department of Information Technology (STQC), new Delhi	Representative
Directorate General Doordarshan, New Delhi	D.P. Singh – Shri S.P. Ahuja
Electronics Research and Development Centre, thiruvananthapuram	Shri Raman T Joseph- Shri Sukesan (Alternate)
Himachal Foturistic Communications Ltd, New Dlhi	Shri Naseem Ahemad- Shri Deepak Bajaj
Ministry of Communications (WPC), New Delhi	Dr.K.R. Sharma – Shri M.V. Raghava (Alternative)
Motorola India Pvt Ltd, New Delhi	Shri Gautam Chhabra – Shri S.P.S. Raghva (Alternate)
National Cable and Telecommunications Association, New Delhi	Shri Vikki Chaudhary
N.G. Technologies Ltd, New Delhi	Shri G.R. Sehgal
Philips Semiconductors Ltd, New Delhi	Shri Arun Thipsay- Shri Arun Deshpande (Alternate)
Research Department (All India Radio & DD), New Delhi	Shri R.C Bhatnagar
Shyam Communication System, New Delhi	Shri Rajeev Mehrotra
Siti Cable Natwork Limited, New Delhi	Shri Rajiv Khattar – Shri V.V.S. Narayana (Alternate)
Star India Pvt Ltd, Mumbai	Shri Tony D. Silva
Telecom Engineering Centre, Department of Telecommunication, New Delhi	Deputy Director General ®- Director ® General (Alternate)
In personal cabacity (B-406 Ramvihar, Sector 30, Noida)	Col V.C. Khare

**Table 1 performance Requirements
(Clause 3.2, 5.6, and 6**

Sl No. (1)	Parameters (2)	Requirements (3)	Method of Tests, Ref to Cl of IS (4)
i)	Electrical specifications: a) Input Voltage range b) Frequency	90-270 V AC 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) Output video b) Output video (L&R) c) RF output d) RF input	75 ohms impedance; female connector (as per ICE 60169-2) 1 X RCA type 2 X RCA type 75 ohms impedance, female connector (as per IEC 60169-2)	-
iv)	RF characteristics at cable system outlet: a) System b) Modulation c) Rf carrier signal level d) Career level differences between distributed TV channel (47 to 862 MHz range) e) Carrier level differences between AM-VSB and 64 QAM digital signal adjacent channel f) Amplitude response within a TV channel g) Lowest carrier to interference ratio h) Cross modulation	Pal B (for VHF), PAL G (for UHF) AM-VSB 60 dBuV, Min 57 dBuV, Min for systems with 8 MHz 80 dBuV, Max 77 dBuV , Max for >20 channels 12dB, Max 13 dB, Max (64 QAM signal must be below the level of adjacent AM – VSB channel) Variation (pp) : 2 dB, Max /slope of variation : 1 dB/MHz, Max 57 dB, Min 57 dB, Min >46 + 10 lg (N-1),	4.7 of IS 13420 (Part I) 4.7 of IS 13420 (Part 1) 4.103 of IS 13420 (Part I) 4.2 of IS 13420 (part 1) - -

		Number of channels	-
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V)	Channel tuner performance characteristics: a) Rf input level b) input frequency range c) RF input channel bandwidth d) RF input impedance e) RF input return loss f) Frequency assignment download	Same as mentioned in RF characteristics at cable system outlet in (iv) 47 to 862 MHz 7 MHz 75 ohms 6dB,Min optical	- - - 4.1.1 to IS 14231 (part 3) -
vi)	RF re-modulator output; a) Modulation format b) RF input channel c) Rf output level d) Carrier to noise ratio	PAL B (for VHF) : PAL G (UHF) VHF Channel ¾;Agile/UHF 60 dBu V, Min 80 dBu V, Max 4dB, Min	4.7 of IS 13420 (part 1) 4.5 of IS 13420 (part 1)
Vii)	Remote control	Optional	
Viii)	Operating temperature range	0 ⁰ c to 50 ⁰ C	
ix)	Operating humidity range	5 percent to 95 percent (non-condensing)	
X)	Finger printing	Essential but manufactures service provider free to choose mechanism	

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Amendment Issued Since Publication

Amend No.	Date of Issue	Text Affected

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