Indian Standard
ANALOG SET TOP BOX—SPECIFICATION

ICS 33.060.40

© BIS 2002

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.
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 purposes, 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 be marked with the Standard Mark.

5 ENVIRONMENTAL TESTS
5.1 Bump Test
The STB shall be subjected to bump test carried out in accordance with IS 9000 (Part 7/Sect 2), the number of bumps being 500 ± 10 and acceleration being 400 m/s². After this test the STB shall conform to the
<table>
<thead>
<tr>
<th>SI No.</th>
<th>Parameters (1)</th>
<th>Requirements (2)</th>
<th>Method of Tests, Ref to Cl of IS (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>h) Electrical specifications:</td>
<td>90-270 V AC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Input voltage range</td>
<td>50 Hz ± 5 percent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Frequency</td>
<td>The STB shall have the capability of bypassing free to air RF signal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>i) Bypass of analog free to air RF signal</td>
<td>75 ohms impedance, female connector (as per IEC 60169-2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) RF input</td>
<td>1 X RCA type</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Output video</td>
<td>2 X RCA type</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Output audio (L and R)</td>
<td>75 ohms impedance, female connector (as per IEC 60169-2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) RF output</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>iv) RF characteristics at cable system outlet:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) System</td>
<td>PAL-B (for VHF); PAL-C (for UHF)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Modulation</td>
<td>AM-VSB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) RF carrier signal level</td>
<td>60 dBµV, Min</td>
<td>4.7 of IS 13420 (Part 1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>57 dBµV, Min for systems with 8 MHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>80 dBµV, Max</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>77 dBµV, Max for &gt; 20 channels</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Carrier level differences between distributed TV channels (47 to 852 MHz range)</td>
<td>12 dB, Max</td>
<td>4.7 of IS 13420 (Part 1)</td>
</tr>
<tr>
<td></td>
<td>e) Carrier level differences between AM-VSB and 64 QAM digital signal adjacent channel</td>
<td>12 dB, Max (64 QAM signal must be below the level of adjacent AM-VSB channel)</td>
<td>4.10.3 of IS 13420 (Part 1)</td>
</tr>
<tr>
<td></td>
<td>f) Amplitude response within a TV channel</td>
<td>57 dB, Min</td>
<td>4.2 of IS 13420 (Part 1)</td>
</tr>
<tr>
<td></td>
<td>g) Lowest carrier-to-interference ratio</td>
<td>&gt; 46 + 10 log (N−1), N = Number of channels</td>
<td></td>
</tr>
<tr>
<td></td>
<td>h) Cross modulation</td>
<td>Slope of variation : 1 dB/MHz, Max</td>
<td></td>
</tr>
<tr>
<td></td>
<td>v) Channel tuner performance characteristics:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) RF input level</td>
<td>Same as mentioned in RF characteristics at cable system outlet in (iv)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Input frequency range</td>
<td>47 to 852 MHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) RF input channel bandwidth</td>
<td>7 MHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) RF input impedance</td>
<td>75 ohms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e) RF input return loss</td>
<td>6 dB, Min</td>
<td>4.1.1 of IS 1421 (Part 3)</td>
</tr>
<tr>
<td></td>
<td>f) Frequency assignment download</td>
<td>Optional</td>
<td></td>
</tr>
<tr>
<td></td>
<td>vi) RF re-modulator output:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Modulation format</td>
<td>PAL-B (for VHF); PAL-C (for UHF)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) RF output channel</td>
<td>VHF Channel 3-4; UHF Channel 1-8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) RF output level</td>
<td>60 dBµV, Min</td>
<td>4.7 of IS 13420 (Part 1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>80 dBµV, Max</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Carrier-to-noise ratio</td>
<td>4 dB, Min</td>
<td>4.5 of IS 13420 (Part 1)</td>
</tr>
<tr>
<td></td>
<td>vii) Remote control</td>
<td>Optional</td>
<td></td>
</tr>
<tr>
<td></td>
<td>viii) Operating temperature range</td>
<td>0°C to 50°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ix) Operating humidity range</td>
<td>5 percent to 95 percent (non-condensing)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>x) Finger printing</td>
<td>Essential, but manufacturer/service provider free to choose mechanism</td>
<td></td>
</tr>
</tbody>
</table>
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 Sl No. (ii) of Table 1]
b) RF output level [see Sl No. (vi) (c) of Table 1], and
c) Carrier to noise ratio [see Sl 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

<table>
<thead>
<tr>
<th>IS No.</th>
<th>Title</th>
<th>IS No.</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>6873:</td>
<td>Limits and methods of measurement of radio disturbance characteristics:</td>
<td>13420:</td>
<td>equipment including electrical business equipment</td>
</tr>
<tr>
<td>9000</td>
<td>Basic environmental testing procedures for electronic and electrical items:</td>
<td>14202:</td>
<td>Methods of measurement and system performance (second revision)</td>
</tr>
<tr>
<td>(Part 2/Sec 4): Cold test, Section 4 Cold test for heat dissipating items with gradual change of temperature</td>
<td>(Part 1): 1993</td>
<td>Identification cards – Integrated circuits – Cards with contacts:</td>
<td></td>
</tr>
<tr>
<td>1977</td>
<td>Proceeds for heat dissipating items with gradual change of temperature</td>
<td>(Part 2): 1993</td>
<td>Physical characteristics</td>
</tr>
<tr>
<td>(Part 3/Sec 5): Dry heat test for heat dissipating items with gradual change of temperature</td>
<td>(Part 3): 2002</td>
<td>Dimensions and location of the contacts</td>
<td></td>
</tr>
<tr>
<td>1977</td>
<td>Damp heat cyclic test, Section 1 1978: 16 + 8 h cycle</td>
<td>14231:</td>
<td>Cabled distribution systems for television and sound signals —</td>
</tr>
<tr>
<td>13252:</td>
<td>Safety of information technology</td>
<td>(Part 8): 2002</td>
<td>Part 3 Active coaxial wideband distribution components</td>
</tr>
<tr>
<td>1992</td>
<td></td>
<td></td>
<td>System performance of return path</td>
</tr>
</tbody>
</table>
ANNEX B
(Foreword)
COMMITTEE COMPOSITION
Radiocommunication Sectional Committee, LTD 20

Organisation
All India Radio, New Delhi
Ahuja Radios, New Delhi
Bharat Electronics Ltd, Bangalore
Central Electronics Engg Research Institute, Pilani
Consumer Electronics TV Manufacturers Association (CETMA), New Delhi
Directorate of Co-ordination (Police wireless), New Delhi
Department of Information Technology (STQC), New Delhi
Development Commissioner Small Scale Industries, New Delhi
Directorate General Doordarshan, New Delhi
Directorate General of Supplies and Disposals, New Delhi
Electronic Component Industries Association, New Delhi
Electronics Corporation of India Ltd, Hyderabad
Institution of Electronics and Telecommunication Engineers, New Delhi
ITI Ltd, Bangalore
Ministry of Communication (WPC), New Delhi
Ministry of Defence, DGAQA, Ghaziabad
Ministry of Defence, DQA, Bangalore
Ministry of Defence, DQAIN, New Delhi
National Physical Laboratory, New Delhi
Oil & Natural Gas Commission, Mumbai
Research Design & Standards Organization, Lucknow
Telecom Engineering Centre, Department of Telecommunication, New Delhi
Videsh Sanchar Nigam Ltd, Mumbai
BIS Directorate General

Representative(s)
Shri K. K. Pillai (Chairman)
Shri A. K. Bhattacharya (Alternate)
Shri S. J. Kalra
Shri D. Metermanan
Shri Sanjiv Verma (Alternate)
Shri S. Bhatnagar
Shri Radhakishan Pratibha Dixit (Alternate)
Shri R. C. Agnihotri
Shri A. K. Gupta (Alternate)
Shri P. P. Malikotra
Shri Satya Pal (Alternate)
Shri R. K. Gupta
Shri R. K. Jain (Alternate)
Shri Anil Gupta
Shri H. R. Shukla (Alternate)
Dr. K. R. Sarda
Shri M. V. Kaviraj (Alternate)
Shri P. A. Ramdas
Shri K. Janaik (Alternate)
Mr. G. Yeshiwan Diva
Major Gen. K. B. Jalihally (Alternate)
Shri C. S. Dilli
Shri B. S. Jagathesan (Alternate)
Dr. Arun Chandra
Dr. S. M. Sharma (Alternate)
Shri A. Pratap Kumar
Shri B. Haripathi (Alternate)
Shri S. G. Jash
Lt-Col. R. S. Patria (Alternate)
Lt Col. C. Rami
Shri J. K. Chandana (Alternate)
Shri S. C. Gang
Shri D. R. Lakshmi (Alternate)
Shri G. S. Muni
Shri R. K. Sethi (Alternate)
Shri Prashad Bhandari
Shri Ashok Kumar
Shri Arun Acharya (Alternate)
Representative
Shri Vimal, Director & Head (LTD)
(Representing Director General (Ex-officio))
Panel for Cabled Distribution System, LTD 20/P7

Representative(s)

Shri M. V. Asthana (Convenor)
Lt. Col. K. K. Sharma
Shri Nicolas Andrieu
Shri Francois Moveau (Alternate)
Shri Atul Ahuja
Shri Rakesh Kher (Alternate)
Shri S. Ranganath
Shri Biju Prasiddha Dirak (Alternate)
Shri Shyam Kastri
Shri Anoop Kumar (Alternate)
Shri Uday Singh
Shri S. P. Ahuja (Alternate)
Shri R. Premji Joseph
Shri S. Senapati (Alternate)
Shri Naveen Arlan
Shri Deependar Bajaj (Alternate)
Dr. K. R. Sharma
Shri M. V. Kesavan (Alternate)
Shri G. G. Sambar
Shri S. P. S. Raghava (Alternate)
Shri Veer Chandra
Shri G. R. Sreed
Shri G. S. Hire (Alternate)
Shri Anil Thapliy
Shri C. P. Deshpande (Alternate)
Shri R. C. Bhattachar
Shri Ravi Mehta
Shri Ravi Khattar
Shri R. V. S. Narayana (Alternate)
Shri Tony D. Silva
Shri A. Jahan (Alternate)
Deputy Director General (R)
Director (R) (Alternate)
Col. V. C. Khare
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, marking and quality certification of goods and attending to connected matters in the country.

Copyright

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. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

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. LTD 20 (1994).

### Amendments Issued Since Publication

<table>
<thead>
<tr>
<th>Amend No.</th>
<th>Date of Issue</th>
<th>Text Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**BUREAU OF INDIAN STANDARDS**

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110 002

Telephones: 323 01 31, 323 33 75, 323 94 02

Telegrams: Manaksanshta (Common to all offices)

Regional Offices:

- **Central**: Manak Bhavan, 9 Bahadur Shah Zafar Marg, 323 76 14, 323 38 43
- **Eastern**: V/14 C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi, 337 84 90, 337 38 61
- **Northern**: SCO 335-336, Sector 34-A, CHANDIGARH 160 022, 337 80 26, 337 91 29
- **Southern**: C.I.T. Campus, IV Cross Rond, CHENNAI 600 113, 600 28 28
- **Western**: Manakalaya, E9 MIDC, Marol, Andheri (East), 254 12 46, 254 14 41
- **Branches**: AHMEDABAD, BANGALORE, BHOPAL, BHIUBANESHWAR, COIMBATORE, FARIDABAD, GHAZIABAD, GUWAHATI, HYDERABAD, JAIPUR, KANPUR, LUCKNOW, NAGPUR, NALAGARH, PATNA, PUNE, RAJKOT, THIRUVANANTHAPURAM, VISAKHAPATNAM,