Indian Standard
ANALOG SET TOP BOX — SPECIFICATION

ICS 33.060.40

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

August 2002

Price Group 3
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.
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/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 1 Performance Requirements

*(Clauses 3.2, 5.6 and 6)*

<table>
<thead>
<tr>
<th>SI No.</th>
<th>Parameters</th>
<th>Requirements</th>
<th>Method of Tests, Ref to Cl of IS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td><strong>Electrical specifications:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Input voltage range</td>
<td>90-270 V AC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Frequency</td>
<td>50 Hz ± 5 percent</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Bypass of analog free to air RF signal</strong></td>
<td>The STB shall have the capability of bypassing free to air RF signal</td>
<td></td>
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<tr>
<td></td>
<td><strong>Connectors:</strong></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>a) RF input</td>
<td>75 ohms impedance, female connector (as per IEC 60169-2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Output video</td>
<td>1 X RCA type</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Output audio (L and R)</td>
<td>2 X RCA type</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) RF output</td>
<td>75 ohms impedance, female connector (as per IEC 60169-2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>RF characteristics at cable system outlet:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) System</td>
<td>PAL B (for VHF), PAL G (for UHF) AM- VSIB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Modulation</td>
<td>60 dBµV, <em>Min</em></td>
<td>4.7 of IS 13420 (Part 1)</td>
</tr>
<tr>
<td></td>
<td>c) RF carrier signal level</td>
<td>57 dBµV, <em>Min</em> for systems with 8 MHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Carrier level differences between distributed TV channels (47 to 862 MHz range)</td>
<td>80 dBµV, <em>Max</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>e) Carrier level differences between AM-VSB and 64 QAM digital signal adjacent channel</td>
<td>77 dBµV, <em>Max</em> for &gt; 20 channels</td>
<td></td>
</tr>
<tr>
<td></td>
<td>f) Amplitude response within a TV channel</td>
<td>12 dB, <em>Max</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>g) Lowest carrier to interference ratio</td>
<td>4.7 of IS 13420 (Part 1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>h) Cross modulation</td>
<td>13 dB, <em>Max</em> (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><strong>Channel tuner performance characteristics:</strong></td>
<td>Variation (pp): 2 dB, <em>Max</em> Slope of variation : 1 dB/MHz, <em>Max</em></td>
<td>4.2 of IS 13420 (Part 1)</td>
</tr>
<tr>
<td></td>
<td>a) RF input level</td>
<td>57 dB, <em>Min</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Input frequency range</td>
<td>&gt; 46 + 10 lg (<em>N</em>-1), <em>N</em> = Number of channels</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) RF input channel bandwidth</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) RF input impedance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>e) RF input return loss</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>f) Frequency assignment download</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>RF re-modulator output:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Modulation format</td>
<td>PAL B (for VHF), PAL G (for UHF)</td>
<td>4.7 of IS 13420 (Part 1)</td>
</tr>
<tr>
<td></td>
<td>b) RF output channel</td>
<td>VIIIF Channel 3/4, Agile/UMIF</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) RF output level</td>
<td>60 dBµV, <em>Min</em></td>
<td>4.5 of IS 13420 (Part 1)</td>
</tr>
<tr>
<td></td>
<td>d) Carrier to noise ratio</td>
<td>80 dBµV, <em>Max</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Remote control</strong></td>
<td>Optional</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Operating temperature range</strong></td>
<td>44 dB, <em>Min</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Operating humidity range</strong></td>
<td>0°C to 50°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Finger printing</strong></td>
<td>5 percent to 95 percent (non-condensing)</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>
</tr>
</thead>
<tbody>
<tr>
<td>6873</td>
<td>Limits and methods of measurement of radio disturbance characteristics: Part 3 Sound and television broadcast receivers and associated equipment (first revision)</td>
</tr>
<tr>
<td>(Part 3) : 1999</td>
<td></td>
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<tr>
<td>9000</td>
<td>Basic environmental testing procedures for electronic and electrical items: Cold test, Section 4 Cold test for heat dissipating items with gradual change of temperature</td>
</tr>
<tr>
<td>(Part 2/Sec 4) : 1977</td>
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</tr>
<tr>
<td>1977</td>
<td>Dry heat test, Section 5 Dry heat test for heat dissipating items with gradual change of temperature</td>
</tr>
<tr>
<td>(Part 3/Sec 5) : 1977</td>
<td></td>
</tr>
<tr>
<td>1981</td>
<td>Damp heat cyclic test, Section 1 16 + 8 h</td>
</tr>
<tr>
<td>(Part 5/Sec 1) : 1981</td>
<td></td>
</tr>
<tr>
<td>1979</td>
<td>Impact test, Section 2 Bump</td>
</tr>
<tr>
<td>(Part 7/Sec 2) : 1979</td>
<td></td>
</tr>
<tr>
<td>13252</td>
<td>Safety of information technology equipment including electrical business equipment</td>
</tr>
<tr>
<td>: 1992</td>
<td></td>
</tr>
<tr>
<td>13420</td>
<td>Cabled distribution systems: Part 1 Methods of measurement and system performance (second revision)</td>
</tr>
<tr>
<td>(Part 1) : 2002</td>
<td></td>
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<tr>
<td>14202</td>
<td>Identification cards – Integrated circuits – Cards with contacts:</td>
</tr>
<tr>
<td>(Part 1) : 1995</td>
<td>Physical characteristics</td>
</tr>
<tr>
<td>(Part 2) : 1995</td>
<td>Dimensions and location of the contacts</td>
</tr>
<tr>
<td>(Part 3) : 2002</td>
<td>Electronic signals and transmission protocols</td>
</tr>
<tr>
<td>14231</td>
<td>Cabled distribution systems for television and sound signals — Specification:</td>
</tr>
<tr>
<td>(Part 3) : 1995</td>
<td>Part 3 Active coaxial wideband distribution components</td>
</tr>
<tr>
<td>(Part 8) : 2002</td>
<td>System performance of return path</td>
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</tbody>
</table>
ANNEX B  
(Foreword)  
COMMITTEE COMPOSITION  
Radiocommunication Sectional Committee, LTD 20  

<table>
<thead>
<tr>
<th>Organization</th>
<th>Representative(s)</th>
</tr>
</thead>
</table>
| All India Radio, New Delhi                                                   | SHRI K. M. PAUL (Chairman)  
SHRI A. K. BHATNAGAR (Alternate)  
SHRI S. J. KALRA  
SHRI D. MURUDHANARAN  
SHRI SAMEER VERMA (Alternate)  
SHRI S. RAGHUNATH  
SHRI HARSIMATI PRASADIA DHAR (Alternate)  
Representative  
SHRI K. C. AGNIHOTRI  
SHRI A. K. GUPTA (Alternate)  
Representative  
SHRI P. P. MALHOTA  
SHRI SATYA PAL (Alternate)  
SHRI R. K. GUPTA  
SHRI R. K. JAIN (Alternate)  
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SHRI ASHOK KUMAR  
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Representative  
SHRI VILAI, Director & Head (LTD)  
[Representing Director General (Ex-officio)] |
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| Bharat Electronics Ltd, Bangalore                                          |                                                                                  |
| Central Electronics Engr 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, DGQA, Bangalore                                       |                                                                                  |
| Ministry of Defence, DQA(N), 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                                                     |                                                                                  |

Member Secretary  
SHRIHARSHI DEEPA GARG  
Deputy Director (LTD), BIS  

(Continued on page 5)
Panel for Cabled Distribution System, LTD 20/P7

Organization

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Cable Operators Federation of India (COFI), New Delhi
Canal-Plus Technologies Ltd, Mumbai

Catvision Products Ltd, Noida

Central Electronics Engg Research Institute, Pilani

Consumer Electronics TV Manufacturers Association (CETMA), New Delhi
Department of Information Technology (STQC), New Delhi
Directorate General Doordarshan, New Delhi

Electronics Research and Development Centre, Thiruvananthapuram

Himachal Futuristic Communications Ltd, New Delhi

Ministry of Communication (WPC), New Delhi

Motorola India Pvt Ltd, New Delhi

National Cable and Telecommunications Association, New Delhi
N. G. Technologies Ltd, New Delhi

Philips Semiconductors Ltd, New Delhi
Research Department (All India Radio & DD), New Delhi
Shyam Communication Systems, New Delhi
Siti Cable Network Limited, New Delhi

Star India Pvt Ltd, Mumbai

Telecom Engineering Centre, Department of Telecommunication, New Delhi

In personal capacity (B-406 Ramvihar, Sector 30, Noida)

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DIRECTOR (R) (Alternate)

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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>
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<tbody>
<tr>
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</tbody>
</table>

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           {60 20 25

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           {254 25 19, 254 13 15

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          {832 92 95, 832 78 58
          {832 78 91, 832 78 92

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