

**PRASAR BHARATI
(BROADCASTING CORPORATION OF INDIA)
DIRECTORATE GENERAL: ALL INDIA RADIO
(P&D UNIT)**

Technical Specification for Digital Switching Console

1. GENERAL

- 1.1 This specification is for the supply of Digital Switching Consoles for use in Control Room(s) of All India Radio. The consoles shall be fully digital and based on the field proven design using state-of-the-art technology. These should be rugged in construction and suitable for reliable operation 24 hours a day and 365 days in a year.
- 1.2 Only professional and branded products manufactured by reputed companies in sound broadcasting equipment field shall be offered.
- 1.3 **The tenderer must submit the following documents along with the tender:**
- (a) A point-to-point compliance statement as per Annexure highlighting deviations, if any, on all the clauses of specification from the manufacturer of the offered equipment duly signed in original. Actual performance figures should be quoted under remarks column. If compliance statement is in format other than Annexure, the tender will be rejected outrightly.**
 - (b) Detailed printed literature of the equipment giving complete electrical and mechanical data including detailed dimensions and mounting requirements.**
 - (c) The quote should either be from the original manufacturer or from their authorized representative/dealer. In case, the quote is from the authorized representative/dealer, a certificate in original from the original manufacturer that the tenderer is authorized representative/dealer for India should be enclosed with the tender.**
- 1.4. The tenderer will be required to demonstrate the complete functioning of the tendered unit at the time of technical evaluation in New Delhi. Non-compliance of equipment demonstration shall disqualify the tender.
- 1.5 Incomplete offers will be rejected outrightly.

2. SCOPE OF THE TENDER:

The specification is for supply of Digital Switching Consoles along with all accessories and mating connectors etc.

3. TECHNICAL SPECIFICATION

3.1 General Features

- 3.1.1 The consoles should be simple in operation.
- 3.1.2 The consoles shall have an attractive ergonomically designed rugged, rustproof metal pre-painted cabinet/s. It may either be a single composite unit or the main electronics portion may be in a separate 19-inch rack mountable unit.
- 3.1.3 The Console should be suitable for Tabletop mounting.
- 3.1.4 The layout design of the console shall permit easy access to the wiring and components for easy servicing.
- 3.1.5 The PCB Modules shall be easily removable & replaceable for inspection & servicing.
- 3.1.6 All switches and selection points on the console surface shall be provided with visual (illuminated) status indication.
- 3.1.7 The Faders on the console surface shall be long throw (100 mm) conductive plastic type and shall be of reputed make.
- 3.1.8 All the Audio inputs and outputs should either be on balanced 3-pin XLR or on D connectors. The contacts of the connectors shall be gold plated.
- 3.1.9 Input / Output and other connectors shall not be on the working area of the console surface.
- 3.1.10 Two of the faders of the console should have provision of Remote Line Selector, each with six inputs. One of the Remote Line Selectors should take all stereo analogue inputs and other should take all digital inputs. Other faders, which will not have any Remote Line Selector, shall be configurable for analogue as well as digital inputs. The faders with Remote Line Selector will have provision for PFL also.
- 3.1.11 The controls for operator like Power On/Off, output bus assignment, channel on/off, monitoring, level controls, talkback, signaling etc will be appropriately located on the control surface of the console.

3.2 Digital Features

- 3.2.1 The consoles shall have state-of-the-art digital circuitry.
- 3.2.2 All the internal Audio Processing in the consoles shall be fully DSP (digital signal processing) based.

- 3.2.3 Various Control Circuits in the consoles shall be digital and entire switching shall be through solid-state switches and not through electromechanical switches/relays.
- 3.2.4 A to D and D to A converters shall have minimum 24 bit resolution.
- 3.2.5 There shall be in-built word clock for synchronization of external digital devices and provision shall also exist to synchronize the console from an external word clock or AES/EBU source.
- 3.2.6 All digital inputs and outputs will be in AES/EBU format & should conform to AES3-1992 signal format.

3.3 Input Fader Channel

Selection for routing any of the inputs to any of the output program buses shall be provided.

3.4 Input Configuration

The consoles shall have minimum 8 faders with following configuration:

- a) Six faders without Remote Line Selector
- b) Two faders each with a six position Remote Line Selector

3.4.1 Configuration of channels without provision of Remote Line Selector

All these six channels should be configurable for stereo analogue as well as digital inputs. The necessary hardware for each configuration should be supplied along with each console.

3.4.2 Configuration of channels with provision of Remote Line Selector

One of the channels with Remote Line Selector should take all the six feeds in balanced stereo analogue format and other to take all six digital inputs.

3.4.3 Stereo Analog Inputs

- a) Nominal Level: + 4 dBu input; adjustable from -10 dBu to +10 dBu with sensitivity control
- b) Max. Level: + 24 dBu
- c) Impedance: ≥ 10 k Ohm

3.4.4 Digital Inputs

- a) Sampling rates: AES/EBU to support sampling rates of at least 32 kHz, 44.1 kHz and 48 kHz
- b) SRC: In-built sampling rate converter from 32 kHz to 48 kHz for AES/EBU format, on each digital input channel
- c) Level Reference: 0 dBFS digital = + 24dBu analogue
- d) Level: Digital input level should match the analogue input as mentioned in Para 3.4.3

3.5 Output Configuration

3.5.1 Output Channels (Buses)

The console should provide at least two independent Programme outputs, each in analogue as well as in digital format.

3.5.2 Analog Outputs

- a) Nominal Level: + 4 dBu with 10 dB reserve gain in each fader
- b) Max. Level: + 24 dBu
- c) Impedance: ≤ 50 Ohm

3.5.3 Digital Outputs

- a) Level Reference: 0 dBFS digital = + 24dBu analogue
- b) Output Level: Digital output level should match the analogue output as mentioned in para 3.5.2

3.6 Frequency Response

Should be $\leq \pm 0.5$ dB over the entire frequency range of 20 Hz to 20 kHz at nominal input and nominal output levels.

3.7 Total Harmonic Distortion + Noise

$\leq 0.01\%$ at max. output level over the entire frequency range of 20 Hz to 20 kHz

3.8 Signal to Noise Ratio

Better than 80 dB at nominal input and output levels with measurement band limited to 20 Hz –20 kHz.

3.9 Inter-channel Cross Talk

Better than 90 dB, with nominal input and output levels and measurement band limited to 20 Hz-20 kHz.

3.10 Monitoring Facilities

3.10.1 Programme Monitor

Stereo monitoring signal, with 0 dBu nominal level, should be available for monitoring on external speakers. Headphones monitoring facility will also be available. Both the monitoring facilities should have an independent built-in level control of 10 dB. Level controls shall be provided on the control surface.

3.10.2 PFL Monitor

Facility to monitor any of the inputs of Remote Line Selector on a PFL speaker as well as on headphones shall be provided. PFL speaker as well as headphones should have inbuilt level control of 10 dB.

3.11 Signaling & Warning Lights

Provision of a 'green light' for 'ready' indication on the console surface (by receiving 0 logic, controlled from the console installed in announcer booth) shall be provided in all the channels other than with Remote Line Selector.

Similarly provision shall be provided for generating 0 logic for 'red warning light signal' from each of the faders, other than Remote Line Selector, for giving "ON – AIR" indication to the respective announcer booth on fade-in.

3.12 Metering

Two numbers of high-resolution indicators to provide the VU as well as PPM (selectable) shall be available to meter the level on any of the output buses.

3.13 Talk-Back

Talkback facility with at least 5 locations shall be available/provided. The talkback mike should preferably be inbuilt.

3.14 Power Supply

3.14.1 The console shall work on 230 V \pm 10 %, 48 to 52 Hz single phase A.C. supply.

3.14.2 The power supply unit of the console shall be protected against overload, short circuit and over-voltage.

3.14.3 Power supply unit/module should either be external or in case of internal, temperature of operating surface should not exceed by 5 degree Celsius when power is ON.

3.15 Climatic Conditions

The console shall generally be installed in air-conditioned environment. However, the console shall perform satisfactorily in the dry temperature range of 5⁰C to 40⁰ C and humid conditions of 85% RH at 40⁰ C. A test certificate in this regard shall have to be produced from an approved Test House.

3.16 Accessories

Each console shall be supplied with following accessories / items and their cost shall be included in quotation:

3.16.1 One complete set of mating connectors (with gold plated contacts) and power chord etc.

3.17.2 One set of operation manual and service manual.

3.17.3 Any other item, including interconnecting cables etc. required for making the console fully operational.

4. GUARANTEE

The equipment shall be guaranteed for trouble free operation for a minimum period of one year from the date of supply. Replacement / servicing shall be effected free of cost at site for hardware and software during the guarantee period.

5. PRE-DESPATCH INSPECTION

Pre-dispatch inspection would comprise of complete testing of the console to be supplied including functional tests and various measurements at manufacturer's premises before shipment by authorized representatives of All India Radio. The Acceptance Test Procedure (ATP) shall be prepared by the tenderer and got approved from the indenter after the firm order is placed. The testing shall include:

(a) Physical tests

- (b) Functional tests
- (c) Performance tests

The tenderer will give a notice in writing to the indenter at least 10 weeks before the commencement of factory inspection. The tenderer shall provide all equipment, materials and manpower as may be required for performing various tests as per ATP. In case of imported equipment, the expenses on air travel, accommodation and daily allowances for AIR's inspecting officers would be borne by All India Radio.

6. SPARES

Essential required spares may be recommended. The spares shall be quoted separately. The list should include name and part no. of the parts / components with quantity and its unit cost. The tenderer shall ensure availability of spares in India for the quoted equipment for a period of at least **5 years** from the date of supply of last equipment. The cost for software upgrades, if any, shall also be quoted as an option.

7. TRAINING

The tenderer shall be required to train at least 16 AIR persons, free of cost, at locations specified by DG: AIR, on operation, maintenance and repair of the equipment.

ANNEXURE

S.No.	Para no. of AIR specification	Tenderer's solution		
		Complied (yes/no)	Actual Values of the offered product	Remarks