

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

Technical Specification for Digital Recording Console

1. GENERAL

- 1.1 This specification is for Digital Recording Consoles for use in Production studios 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-I 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 out rightly.**
 - (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 out rightly.

2. SCOPE OF THE TENDER

The specification is for supply of Digital Recording 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 balance 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 The controls for Power On/Off, output bus assignment, Channel on/off, monitoring level control, talkback & signaling etc. will be appropriately located on the control surface of the console.
- 3.1.11 Provision for ganging, the mono inputs for stereo operation, should be available.

3.2 Fader Modules Features

All the fader modules shall have the following minimum provisions:

- 3.2.1 Selection for feeding/assigning any of the fader input to any of the output programme buses.
- 3.2.2 Each fader should fade in from infinity to zero to provide nominal output with 10dB reserve gain.
- 3.2.3 Pre Fade Listening (PFL).

3.3 Digital Features

- 3.3.1 The consoles shall have state-of-the-art digital circuitry.
- 3.3.2 All the internal Audio Processing in the consoles shall be fully DSP (digital signal processing) based.
- 3.3.3 Various Control Circuits in the consoles shall be digital and entire switching shall be through solid-state switches and not through electro mechanical switches/relays.
- 3.3.4 A to D and D to A converters shall have minimum 24 bit resolution.
- 3.3.5 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.
- 3.3.6 All digital inputs and outputs will be in AES/EBU format and conform to AES3-1992 signal format.

3.4 Input Configuration

The consoles shall have minimum 12 faders. In case the frame size is not exactly matching the requirement of 12 input faders, higher frame size may be offered. The minimum requirement of input sources, faders and its configuration are as detailed below.

- a) No. of faders: 12
- b) Provision to connect input sources:

| | |
|---------------------|--|
| Analogue mono line | 8 (with further provision to configure as 4 stereo analogue line inputs) |
| Digital stereo line | 8 |
| Mono Mic | 8 |
- c) It should be possible to feed 4 Digital Stereo line inputs alongwith 8 mono mic inputs, with a facility to replace each mike input with a mono line input.

3.4.1 Mono Mic Inputs

All mic channels shall have the following features and parameters:

- 3.4.1.1 Provision to gang two mic channels for feeding stereo (mike) input.
- 3.4.1.2 Built in switch-able Phantom Supply of 48 Volts

- 3.4.1.3 Provision for muting of various monitoring speakers as detailed in section 3.12
- 3.4.1.4 Input Level between –60 dBu to –35 dBu. (Ref. 0 dBu = 0.775V rms) with sensitivity control
- 3.4.1.5 Input Impedance= >1 K ohms balanced
- 3.4.1.6 Selectable in built parametric equalizer with high Q capable of providing at Least \pm 12dB equalization, independent, in each of three band i.e. at low, mid and high audio frequencies
- 3.4.1.7 Phase reversal switch
- 3.4.1.8 Pan pot

3.4.2 Mono Analogue Line Inputs

All mono analogue channels shall have the following features and parameters:

- 3.4.2.1 Nominal level: + 4 dBu with headroom of at least 15 dB
- 3.4.2.2 Input Impedance: >10 K ohms balanced.
- 3.4.2.3 Pan control in each channel

3.4.3 Digital Inputs

All Digital Input Channels shall have the following features/parameters:

- 3.4.3.1 Level Reference: 0 dBFS digital = + 24dBu analogue
- 3.4.3.2 Level: Digital inputs should match the Analogue inputs as mentioned in Para3.4.2
- 3.4.3.3 Sampling rates: AES/EBU to support sampling rate of at least 32 kHz, 44.1 kHz and 48 kHz.
- 3.4.3.4 SRC: In-built sampling rate converter from 32 kHz to 48 kHz for AES/EBU Format, on each digital input channel

3.5 Output Configuration

The console should provide at least 4 independent stereo Programme Outputs, each in analogue as well as in digital format.

3.5.1 Analogue Output

- (a) Nominal Output Level: + 4dBu
- (b) Max. Output Level: + 24dBu
- (c) Output Impedance: \leq 50 ohms

3.5.2 Digital Output

- (a) Level Reference: 0 dBFS digital = + 24dBu analogue
- (b) Output Level: Digital output level should match the analogue output as mentioned in para 3.5.1
- (c) Output Impedance 110 ohms.

3.6 Frequency Response over the entire frequency range of 20 Hz to 20 kHz and at nominal input and nominal output levels:

- (a) Mic inputs to program outputs within \pm 0.5 dB
- (b) Analogue/ Digital line inputs to program outputs within \pm 0.3 dB

3.7 Total Harmonic Distortion + Noise

\leq 0.01% at maximum rated output level and over the entire frequency range of 20 Hz to 20 kHz

3.8 Equivalent Input Noise Level and Signal to Noise Ratio

- (a) Equivalent input noise shall be better than: -125 dBu
(For microphone channels, with nominal input level of -60 dBu and nominal output of +4 dBu (rest of the input faders in off position) and measurement band limited to 20 Hz-20 kHz.)
- (b) Signal to Noise Ratio for Line Channel: \geq 80 dB
(With nominal input level of +4 dBu in line channel and +4 dBu output and rest of the input faders in off position and measurement band limited to 20 Hz-20 kHz.)

3.9 Inter-channel Cross Talk

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

3.10 Monitoring Facilities

3.10.1 Announcer Monitor

Monitoring signal of 0 dBu nominal level should be available for monitoring on external speakers for any one of the programme outputs selected. Headphone monitoring facilities will also be available. Both the monitoring facilities shall have built-in level controls of 10 dB.

It should be possible to select any of the two external stereo sources on the monitor.

3.10.2 Studio Monitor

Similar monitoring facilities, as under para 3.10.1, shall be provided for artists in studio for any one of the programme outputs selected.

3.10.3 PFL Monitor

Facility to monitor all input channels on a built-in PFL speaker as well as on headphones shall be provided. PFL speaker as well as headphone should have inbuilt level control of 10 dB.

3.11 Talk-Back

Talkback facility with another console, installed in control room, shall be available. The talk back mic should preferably be inbuilt.

3.12 Mute Controls

PFL, Talkback and Announcer monitor speakers in Announcer Booth of the studio shall get muted when any announcer/DJ - mic channel is faded in. Similarly studio monitor for artists shall be muted when any artist - mic is faded in.

3.13 Signaling & Warning Lights

- (a) Provision for a 'red light' (On-Air) indication on the console surface (by receiving 0 logic, controlled from the console in control room) shall be provided.
- (b) Provision for generating at least two warning light signals (0 logic) controlled from each fader at which mic channel has been connected/assigned.
- (c) Provision should also exist for generating a 'green light' for sending ready signal in control room by extending '0' logic.

3.14 Metering

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

3.15 Power Supply

- 3.15.1 The console shall work on 230V \pm 10 %, 48 to 52 Hz single phase A.C. supply.
- 3.15.2 The power supply unit of the console shall be protected against overload, short circuit and over-voltage.
- 3.15.3 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.

3.16 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.

3.17 Accessories

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

- 3.17.1 A Stereo Headphone Amplifier for feeding 8 headphones for simultaneously monitoring, as per AIR specification NO. SSE- 5024, enclosed as annexure II.
- 3.17.2 8 Nos. of Studio Headphones With Volume Control, as per AIR specification NO. SSE- 5025, enclosed as annexure III.
- 3.17.3 A complete set of mating connectors (with gold plated contacts) and power chord etc.
- 3.17.4 A set of operation manual and service manual.
- 3.17.5 Any other item, including interconnecting cables and related software for the console 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. ELECTROMAGNETIC COMPATIBILITY

The console shall conform to the electromagnetic standards that are listed in the guidelines 89 / 336 / EC & FCC, Part 15.

8. TRAINING

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

ANNEXURE - I

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