



प्रसार भारती
PRASAR BHARATI
(Broadcasting Corporation of India)
दूरदर्शन महानिदेशालय
Directorate General: Doordarshan
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New Delhi - 110 001

File No. 19(2)2019-20E1 (P) TV

Dated: 10.01.2020

Subject: Draft Specification for procurement of digital audio mixer.

The Draft specification of the upcoming tenders is enclosed herewith to offer comments, if any by due date at e-mail address ddpurchase401@yahoo.co.in or on following Address:

Assistant Director Engineer
Room No. 403,
Directorate General: Doordarshan,
Doordarshan Bhawan,
Copernicus Marg,
New Delhi - 110001 (India)
Telephone: 011- 23114401


Specification: Draft Specification for procurement of digital audio mixer.

Specification no: SD 01/2020 Dated 08.01.2020 (10 pages)

The respected bidders are requested to quote their budgetary quote also.

Due Date to offer Comments: **27.01.2020**

Encl.: As above


(C.R. Singh)
Assistant Director (Engg.)
For DG: DD

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PRASAR BHARTI
(INDIA'S PUBLIC SERVICE BROADCASTER)
DIRECTORATE GENERAL: DOORDARSHAN

SPECIFICATIONS FOR DIGITAL AUDIO MIXER

Specifications No.: SD 01/2020
Dated: 08.01.2020

1. SCOPE:

The specifications lay down the performance requirement of Digital Audio mixing console for program production, transmission, and live performance applications in TV studio/OB for Doordarshan Network.

2. GENERAL:

- 2.1 The offered equipment should be from an internationally reputed manufacturer and the quoted model should be field proven and in use by leading broadcasters. The bidder should essentially submit the list of the broadcasters to whom the quoted model has been supplied. The tenders without the proper user list shall liable to be rejected out rightly.
- 2.2 The product offered against these specifications should be highly reliable, user friendly & convenient to operate for optimum utilization of all the features.
- 2.3 The offered console should be a professional broadcast quality product suitable for 24x7 operations.
- 2.4 The offered console may either be single table mountable composite unit having I/Os, DSP and control surface or table mountable control surface (containing faders, switches, & level display etc.) with a separate 19" rack mountable main electronics portion/core (containing I/Os, DSP etc.).
- 2.5 The indicative bill of material (BOM) has been provided in **Appendix-I**. The bidder is required to provide the complete list of items, modules, sub-modules, software, accessories etc. offered to meet the specifications requirement in the following proforma:

Sr. No.	Description/Name of the items	Make	Model	Part No., if any	Qty.
1.	2.	3.	4.	5.	6.

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- 2.6 The equipment are being procured for various Doordarshan Centres as per **Appendix-II**.

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3. ESSENTIAL FEATURES:

- 3.1 The control surface of the offered Audio Mixer should be compact & ergonomically designed for a complex live broadcast environment providing complete operational ease to the operator. Layout of modules/ parts/ components in the console should permit easy access to wiring, inspection, repairs/servicing.
- 3.2 The console should be totally self contained unit and should not require aid of any external computer/laptop for normal operations. Various operational features like channel routing, mix-minus, phantom On/Off, EQ, Gain etc. shall essentially be available on the console surface.
- 3.3 The offered mixer should have excellent frequency response, low Total Harmonic Distortion and high S/N ratio.
- 3.4 The Audio Mixer should be able to constantly monitor the status of all major hardware and software systems and provide the information for troubleshooting and fault finding.
- 3.5 The control surface as well as main processing core electronics (in case of separate DSP & I/Os) should have auto switchable redundant power supplies.
- 3.6 The control surface of the offered Audio Mixer should have at least 24 numbers of faders. 16 faders should be optimized for input channel and remaining faders will be used as group, VCA faders and master faders.
- 3.7 The control surface should have 100mm conductive plastic motorized faders of reputed make.
- 3.8 The control surface of the offered Audio Mixer should be capable of working in six surface layers/sections/banks to allow fader-control of at least 6 times as many channels as there are faders on the surface. It should be possible to place any individual channel in more than one layer/ section/ bank. It should also be possible to keep some parameter and faders out from layers/ sections/ banks selection.
- 3.9 The control surface should display name/ identification of the selected source on an individual channel for instant visual recognition of each channel's audio source. Names/ identifications of the source should be user assignable/ configurable.
- 3.10 The offered console should be able to accept microphones, analogue line and AES/EBU digital audio inputs.

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3.11 The offered Audio Mixer should have following Inputs/Outputs (I/Os):

- (i) 32 mono Mic/Line inputs on XLR with switchable 48V phantom power
- (ii) 8 Digital AES3 inputs with SRC on XLR
- (iii) 32 analogue Line outputs on XLR
- (iv) 8 Digital AES3 outputs on XLR
- (v) 8 GPIO,
- (vi) 1 Headphones output
- (vii) 64 channel MADI port(s) for multi-track I/O

3.12 In case I/Os are not on XLR connectors, bidders are required to offer breakout box along with necessary interconnecting cable & connectors at both ends. Connectors to be used for breakout box should be of high quality similar to Neutrik and Canare.

3.13 Inputs/Outputs of the offered Audio Mixer should be scalable so that number of Inputs/Outputs can be expanded whenever required in future. The mixer is therefore required to have suitable interface to expand the pool of inputs and outputs that may be mixed on the surface.

3.14 The offered mixer should have capability to map all the internal or external sources to any cross point.

3.15 The offered mixer should have direct output for input channels.

3.16 The offered mixer should have sample rate conversion facility on all digital inputs.

3.17 The offered mixer should work on internal reference and external reference such as analogue video or word clock.

3.18 The offered mixer should have panning facility to pan input to output busses.

3.19 The offered mixer should have pre fader input gain control.

3.20 The offered mixer should have insert facility to insert external signal processing equipment into the system. Each insert should have a send and a return for providing a convenient break in the signal chain.

3.21 The Console should be DSP based and all the processing in the console shall be performed in the digital domain. Console should have at least 40-bit floating point digital signal processing for optimum performance at all times so as to provide crystal clear audio at all the time.

3.22 The Audio Mixer should have at least 96 DSP channels. DSP should be applicable to inputs, auxes, groups and masters.

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- 3.23 The mixer should have four band parametric equalizers. It should also have Low-cut/ High Pass and High-cut/ Low Pass filters.
 - 3.24 The offered mixer should be capable of Dynamics processing including Gate, Expander, Compressor and Limiter.
 - 3.25 The mixer should be capable of displaying curves during adjustment of parameters like equalizers (EQ), dynamics processing etc.
 - 3.26 The offered mixer should be equipped with Delay module to provide delay up to 100ms or more in mono channels.
 - 3.27 The mixer should have busses for at least 8 group, 16 Aux including mix-minus and 4 stereo Master. It should also have Pre Fader Listen, Talkback, Control Room and Studio Monitoring facility.
 - 3.28 The offered mixer should be able to provide multiple VCA groups.
 - 3.29 In addition to stereo and mono sound, the mixer should have surround sound production capabilities. It should be equipped with surround panning facility to place any audio at desired location in surround space. It should also have down mix facility to convert surround sound to mono/ stereo.
 - 3.30 The mixer should have Pre Fader Listen (PFL) facility.
 - 3.31 The Mixer should have monitoring facility of Master, Aux, Group, Mix-Minus and PFL busses on control room speakers, studio speakers, and PFL speakers. Monitoring on Headphone should also be available.
 - 3.32 The mixer should have metering for input sources (pre fader, output, direct output etc.), Aux, Group, Mix-Minus, and Master buses.
 - 3.33 Offered Audio console should be equipped with LCD/TFT touch screen to facilitate easy and fast menu based operations.
 - 3.34 The mixer should be equipped with talkback facility. Talkback microphone output should be routed through Master, Aux or Group busses to studio monitors.
 - 3.35 It should be possible to save and recall the configuration settings of console for later use.
 - 3.36 The mixer should have channel mute facility.
 - 3.37 The mixing console should have ganging facility to link the selected parameter(s).
 - 3.38 The offered mixer should have built-in oscillator to generate test tones. The tone generator should have frequency and level control. The test tone should be assignable to any Aux, Group, Mix-Minus, and Master buses.

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3.39 The offered mixer should be able to trigger warning light /on air light of the studio as and when master fader is up.

3.40 The offered mixer should have automatic microphone mixing facility for multi-microphone unscripted events such as talk-shows and panel discussions to automatically adjust the levels of active and inactive microphones and keep the amount of total gain at a constant level and minimize background noise and crosstalk.

4. TECHNICAL SPECIFICATIONS:

Sr. Nos.	Technical Parameter	Parameter Values
1.	Input Channel Specifications	
1.1	Mic/Line inputs	
(a)	Input Channels	: 32 mono Mic/Line inputs on XLR with switchable 48V phantom power
(b)	Input Sensitivity	: -55dBu to 24dBu
(c)	Frequency response	: ± 0.9 dB (20 Hz to 20KHz)
(d)	Input impedance	: ≥ 1.5 K Ω
(e)	Cross talk	: better than -100dB at 1 KHz
(f)	CMRR	: better than 50dB at 1 KHz
(g)	THD & N	: better than -85dB at 1 KHz
1.2	Digital Inputs	
(a)	Input Channels	: 8 AES3
(b)	Sampling rate	: 48 KHz
(c)	Input impedance	: 110 Ω
(d)	Resolution	: 24 bit
(e)	Sampling rate converter range	: 30 KHz to 100 KHz
(f)	Input Sensitivity	: 0.2V-7V or better
2.	Output Channel Specifications	
2.1	Analog outputs	
(a)	Output Channels	: 32 nos.
(b)	Output level range for digital full scale	: +15dBu to +24dBu
(c)	Frequency response	: ± 0.3 dB (20 Hz to 20KHz) or

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			better
(d)	THD & N	:	better than -90dB at 1 KHz
(e)	Output impedance	:	<60Ω
2.2	Digital Outputs		
(a)	Output Channels	:	8 AES3
(b)	Sampling rate	:	48 KHz
(c)	Output impedance	:	110 Ω
(d)	Resolution	:	24 bit
(e)	Output Level	:	3V or better
3.	External Reference	:	PAL black burst, Word clock (48 kHz) on BNC, 75Ω or hi-Z
4.	Power Supply Requirement	:	230V± 10%, 50 Hz
5.	Operating Temperature Range	:	10 to 40 Deg. Celsius
6.	Operating humidity	:	15% to 85%

5. ACCESSORIES:

All the essential accessories, such as various types of special connectors, power cords with suitable top, breakout box with necessary cable & connectors (if required) etc. should essentially be quoted by the firm to insure the completeness of the system in all respect for proper utilization of the offered digital audio mixing console in a professional TV broadcast studio set- up.

6. COMPLIANCE:

- (a) **A point-by-point compliance statement from the principal manufacturer in respect of all the points laid down in these specifications is to be enclosed along with the offer in the format given below. Mere signature on the copy of the specifications shall not be accepted as a compliance statement.**

The figures so mentioned should be supported by record of these in the technical literature enclosed with the tender and reference to the page number of enclosed literature for all features and technical specifications should be mentioned in the relevant column. Offers without the compliance statement or with incomplete

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compliance statement will liable to be rejected with the sole responsibility of the bidder. **Any deviation from the specification detailed in the compliance statement is to be highlighted separately.**

Sr. No of DD specs.	DD specs.	Compliance (Yes/No)	Performance Fig. of equipment Offered.	Reference to the Page Number of enclosed literature	Deviations, in case of non-compliance	Optional items if any reqd. to make the sys. Compliant to DD specs.	Features in the offered Product which exceeds DD specs.
1.	2.	3.	4.	5.	6.	7.	8.

- (b) In addition to above, a separate point by point compliance statement duly signed by the bidder in respect of all the points laid down in the specifications for all the offered equipment/item(s) should also be submitted alongwith the bid by the bidder in the above mentioned proforma.

7. TRAINING:

The bidder should also offer 04 days on site comprehensive operation & maintenance training on the offered equipment for Doordarshan Engineers at each Center where this equipment is being provided as per **Appendix-II**. The bidder has to provide the comprehensive training material in the form of hard copies as well as soft copies to the trainees during the training session.

The training proposal is required to be submitted at least one month in advance before the suggested date of training by the successful bidder.

8. DOCUMENTATION:

One set of technical manuals/brochures for all the equipment are required to be provided along with the tender to facilitate the technical evaluation, otherwise the tender is liable to be ignored. The successful bidder will have to supply a set of technical/user manuals and operation & maintenance manuals with respect to each of the offered equipment.

9. GUARANTEE:

- (a) With reference to the clause no.8.2 of the "General Terms And Conditions (GTC)" under **ANNEXURE-II** of tender document, the

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equipment should be guaranteed for **three years** of trouble free operation from the date of supply. In case of equipment failure including software and hardware within this period, the same shall be rectified or replaced free of cost to Doordarshan.

- (b) The guarantee includes all hardware, software and modules of the complete system.

10. DELIVERY PERIOD:

The Delivery period will be 03 months. **The delivery period does not include post delivery on-site training.**

11. DEMONSTRATION:

If necessary, the bidder may be asked for demonstration of the offered system as part of the technical evaluation. In such case, the bidder will have to make suitable arrangement for the demonstration of the offered system at Doordarshan Bhawan, New Delhi, on notice of 15 days. Accordingly the bidder should be in readiness for demonstration on a notice of 15 days.

12. INSPECTION:

The equipment shall be subjected to inspection by Doordarshan officials at New Delhi.

13. ENCLOSURES:

The bidder must necessarily submit the following enclosures along with the technical bid:

- (a) Compliance statement with respect to all the points of the specifications duly signed by the OEM.
- (b) The reference to the page number of enclosed literature for all features and technical specifications should be essentially mentioned in the relevant column of the compliance statement.
- (c) Technical manuals/Detailed technical literature/catalogues for all the offered products for substantiating the model no. and technical specifications.
- (d) Model specific User list of the offered product.**
- (e) Any other document mentioned elsewhere in the tender document.

The tender is liable to be rejected in the absence of the above enclosures with the sole responsibility of the bidder.

INDICATIVE BILL OF MATERIAL (BoM)

Sr. Nos.	Details of Items	Qty.
1.	At least 24 fader Control Surface based Digital Audio Mixing Console with following Input/Outputs and as detailed in the specifications:- (i) 32 mono Mic/Line inputs on XLR with switchable 48V phantom power (ii) 8 Digital AES3 inputs with SRC on XLR (iii) 32 analogue Line outputs on XLR (iv) 8 Digital AES3 outputs on XLR (v) 8 GPIO, (vi) 1 Headphones output (vii) 64 channel MADI port(s) for multi-track I/O	4 Sets
2.	All essentially required accessories such as power cord with suitable top, breakout box with necessary cable & connectors (in case required), all types of special connectors etc. to insure the completeness of the offered system	4 Sets
3.	Operation manual/User Guide/Technical Manual/ Installation Manual etc.	4 Sets
4.	Service & Maintenance Manuals	4 Sets
5.	04 days on site comprehensive operation & maintenance training on the offered equipment for Doordarshan Engineers at each Center where this equipment is being provided. Note: The delivery period does not include post delivery on-site training at each location	2 Jobs

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**EQUIPMENT ARE BEING PROCURED FOR THE FOLLOWING
DOORDARSHAN CENTRES**

Sl. No.	Zone	Location of Doordarshan Centre	Qty.
1.	North Zone (NZ)	DD News, Delhi	3 Set
2.		CPC, Delhi	1 Set
TOTAL			4 Sets

