

**PRASAR BHARTI
(India's Public Service Broadcaster)
Directorate general of Doordarshan
Doordarshan Bhawan, Copernicus Marg
New Delhi -110001.**

File No. 19(2)2020-21E1 (P) TV

Date: 07/10/2021

Subject: Draft Specifications for Procurement of 2 M/E Multi Format Production Switcher.

The Draft specification of the upcoming tender is enclosed herewith to offer comments, if any by prospective bidders/Firms. Please also submit budgetary quote of the item on or before due date at e-mail ddpurchase401@yahoo.co.in or on following Address:

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Room No. 403,
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Specification For: Draft Specifications for Procurement of 2 M/E Multi Format Production Switcher.

Specification no: SD 02/2021 Dated 20/09/2021

Due Date to offer Comments: 20.10.2021

Encl.: As above (10 Pages)



Prabhat Kumar Singh
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PRASAR BHARATI
(India's Public Service Broadcaster)
DIRECTORATE GENERAL: DOORDARSHAN
Doordarshan Bhawan, Copernicus Marg,
New Delhi-110001.

SPECIFICATIONS FOR PROCUREMENT OF 2 M/E MULTI FORMAT PRODUCTION SWITCHER

Specifications No.: SD 02/2021

Dated: 20.09.2021

1. SCOPE:-

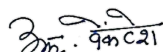
These specifications lay down the required performance characteristics of broadcast quality 2 M/E Multi Format Video Production Switcher and 24 Cross point 2M/E control panel. The Switcher will be used in Doordarshan Network for live production/transmission of News, Sports and other special events of national importance in Studios as well as in OB applications.

2. ESSENTIAL REQUIREMENTS:-

- 2.1 Offered product 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.
- 2.2 The switcher should be perfectly designed with mission critical applications with auto switchable redundant power supplies for frame and control panel.
- 2.3 The switcher should have two full function multi-format M/Es and Each M/E should have minimum of four built-in full function keyers along with modifier. The control panel should have dedicated rotary controls to set various parameters for the key layers on each M/E.
- 2.4 All the full function keyers should have linear, luminance key and Chroma key, mask, matt, fill and key invert.
- 2.5 It should be possible to do at least two chroma key simultaneously in the offered switcher.
- 2.6 Each M/E should have wipe generators with pattern generators having possibility to modify various wipes with softness, position,

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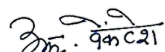
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- aspect ratio, rotation, multiplication, modulation, border width, border softness and border color etc.
- 2.7 Each M/E should have matte generator capable of multicolor wash and assignable to background, key fill and border fill. It should be possible to preview different sources and various effects created on them.
 - 2.8 Each key of M/E should have selection feature for assigning different key and fill signal and it should be possible to copy entire contents of a keyer in the same or different M/Es.
 - 2.9 It should be possible to take the output of an ME and uses it as the background or key on the other ME.
 - 2.10 The switcher should Support Ultra High Definition (Quad Link), High Definition format (16:9 Aspect Ratio) and Standard Definition format (16:9 and 4:3 Aspect Ratio).
 - 2.11 The switcher should have 32 video inputs supporting SD-SDI and HD-SDI formats.
 - 2.12 Out of 32 video inputs at least 4 inputs should be multi-format and should have internal Up-conversion SD (4:3)/(16:9) to HD (16:9) to accept SD sources.
 - 2.13 The switcher should have 16 nos. outputs including Auxiliary Outputs.
 - 2.14 Out of 16 video outputs at least 2 outputs should be multi-format and should have internal Down-conversion (HD (16:9) to SD (4:3)/ (16:9) to provide SD outputs.
 - 2.15 Delay due to format conversion should be within one frame with reference to the reference signal. Further, it should be possible to adjust the delay of the unconverted input signals.
 - 2.16 The switcher should be equipped with at least 4 Nos. of floating 2D DVEs assignable to ME1 and ME2 in the configuration of 4-0, 3-1, 2-2, 1-3, and 0-4. 2D DVEs should be capable of resize and reposition in respect of window size and its position on the screen.
 - 2.17 The Up/Down conversion facility as described in para 2.12 & 2.14 above and DVE facility described in para 2.16 above must be available simultaneously.
 - 2.18 The switcher should have at least 4 channel Internal Frame Memory to store at least 900 frames of HD resolutions. It should be possible to instantly recall the stored frame/clip. It should support embedded audio. It should be possible to import frame/clips through a suitable interface.

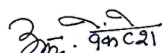
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- 2.19 It should be possible to create transition/wipes using graphics from the frame memory.
- 2.20 The switcher should facilitate transition from the on-air video to a new video through cut, mix (dissolve) and wipe. Transition should take place manually by T-bar fader as well as automatically by button. Auto transition should be possible at desired speed in terms of frames and seconds.
- 2.21 The control panel of the switcher should be ergonomically designed for producing any complex live broadcast environment providing complete operational ease to the operation especially for fast paced broadcast production environments.
- 2.22 Operational buttons should be well illuminated and should be able to customize the source names for different applications.
- 2.23 Control panel should have minimum twenty four directly accessible cross point source buttons in ME Buses. It should have capability to map all the sources to any cross point.
- 2.24 It should be possible to assign a name to each source and should have Mnemonic display to display source name in the directly accessible cross-point buttons of the control panel with excellent visibility and viewing angles. Remaining source names should be displayed while pressing shift button assigned in first row.
- 2.25 The control panel should be equipped with high resolution touch screen menu panel preferably be mounted internally. In case of external high resolution touch screen menu panel, it should be of approximately 14 inch to 17 inch of diagonal size having instant functionality selection with intuitive user control. It should be highly rugged, reliable and industrial grade for use in harsh environment.
- 2.26 The switcher should have macros to automate multiple keystroke operations and can be recalled with a single button press. It should be possible to real-time preview and editing of macros through on-screen menu, and can be attached to the control panel buttons for operator flexibility.
- 2.27 The switcher should have effect memory to save events related to cross points transitions including wipes, DVEs, and keyers as a snapshot. It should also be possible to save/ store multiple snapshots. Further, it should also be possible to save/store these snapshots on an external memory device.
- 2.28 The switcher should have facility to indicate non-synchronous source (s), On-Air source (s) and failure of power supply unit.
- 2.29 It should have built in format-independent multi-viewer with minimum two independently configurable outputs for production

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monitoring. It should be capable of storing layouts and recalling the same as per the production requirement with names and tally indicators.

- 2.30 It should be possible to control external devices such as Recorders, Video Server directly from the switcher through suitable broadcast industry standard interfaces.
- 2.31 The Bill of Material required is given in **Appendix-I**. The bidder is required to provide the complete list of items & accessories etc. offered to meet the specification requirement in the following proforma:

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

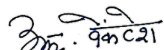
- 2.32 The list of Doordarshan centers for which the equipment are being procured is as given in **Appendix-II**.

3. TECHNICAL SPECIFICATIONS:-

Sr. No.	Technical Parameter	Parameter Values
A.	Video Performance	
1.	Signal processing	: 10 bits, 4:2:2 digital processing for SD & HD
2.	Data Rate	: 270 Mbps for SD-SDI and 1.485 and 2.97 Gbps for HD-SDI
3.	Supported Video Formats	: SMPTE 259M, SMPTE 292 M, SMPTE ST 424
4.	Aspect Ratio	: 4:3 & 16:9 for SD-SDI and 16:9 for HD-SDI
5.	System delay	: ≤ Single line (without FS, FC & DVE)
6.	Return Loss	: ≥15dB for SD-SDI input ≥12dB for HD-SDI input
B.	Input	
1.	Video-input	: 32 nos. conforming to SMPTE ST 424, SMPTE 292M(HDTV), SMPTE 259M (SDTV) on 75Ω BNC
2.	Reference input	: SD black burst/composite sync, HD Tri-level sync. on 75 Ohm BNC with loop through

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C.	Output	
1.	Video-output	: Minimum 16 nos. conforming to SMPTE ST 424, SMPTE 292M (HDTV), SMPTE 259M(SDTV) on 75Ω BNC configurable as Preview, Program dedicated or assignable to any Bus including Auxiliary Bus
D.	Interfaces	
1.	GPI/Tally I/O	: Minimum 32 nos. on D-type
2.	External interface	: RS422, RJ45 Ethernet, USB
E.	Power Supply	: 220 V AC \pm 5%, 50 Hz (Two fully independent hot swappable power supplies for Main frame and Control Panel)

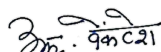
4. COMPLIANCE:

- a) **A point by point full compliance statement laid down in the specifications from the principal manufacturer is to be enclosed along with the offer in the format given below. Mere signature on the copy of DD 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 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 in above mentioned proforma duly signed by the bidder in respect of all the points laid down in the specifications and authorization from principal
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manufacturer should also necessarily be submitted along with the bid by the bidder.

5. TECHNICAL LITERATURE:

One set of technical manuals/brochures of the offered 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 and installation manuals.

6. 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.

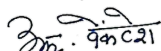
7. GUARANTEE:

- a) The complete system including all items/equipment should be guaranteed for three years of trouble free operation from the date of receipt of final accepted consignment at respective consignee's premises. In case of any item or equipment failure including software and hardware within this period shall be rectified or replaced free of cost to Doordarshan.
- b) After sales service support for additional 2 (two) years for repairs/maintenance of the offered system after the completion of guarantee/warranty period should also be provided. The bidder will be required to give undertaking to this effect along with the bid
- c) The guarantee should cover all hardware, software and modules of the complete system.
- d) The bidders are required to submit complete details of after sales service arrangements in respect of the offered equipment. After sales service arrangements should include details of infrastructural facilities available in India.

8. DELIVERY PERIOD:

The delivery period will be 03 months. **The delivery period does not include training.**

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9. TRAINING:

The bidder should offer 03 days operation and maintenance training on the offered equipment for Doordarshan Engineers. 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 will be conducted at one Doordarshan Centre. The name of Doordarshan Centre will be intimated at the time of finalizing the training schedule.

10. INSPECTION:

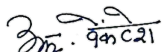
The equipment shall be subjected to inspection by Doordarshan officials at New Delhi.

11. ENCLOSURES:

The bidder must necessarily upload the following documents along with the technical bid:

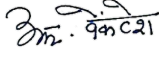
- a) Compliance statement with respect to all the points of the specifications duly signed by the OEM should be submitted for offered equipment/item(s) in the proforma mentioned in clause no. 4.(a). The reference to the page number of enclosed literature for all features and technical specifications should be essentially mentioned in the relevant column of the compliance statement.
- b) A separate point by point compliance statement duly signed by the bidder in respect of all the points laid down in the specifications for the offered equipment/item(s) in the proforma mentioned in clause no. 4.(b).
- c) Authorization from principal manufacturer mentioned in clause no. 4.(b).
- d) Undertaking for after sales service support for additional 2 (two) years for repairs/maintenance of the offered system after the completion of guarantee/warranty period mentioned in Clause 7. (b).
- e) Complete details of after sales service arrangements in respect of the offered equipment available in the country mentioned in clause no. 7.(d).
- f) Technical manuals/detailed technical literature/catalogues for the offered equipment/item(s) for substantiating the model no. and technical specifications.
- g) Model specific user list of the offered product(s).
- h) Any other document mentioned elsewhere in the tender document.

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

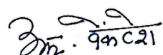


आर. वेकटेश / R. VENKATESH
निदेशक (अभि) / DIRECTOR (ENGINEERING)

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Appendix-I**INDICATIVE BILL OF MATERIAL (BOM) REQUIRED**

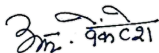
Sl. Nos.	Detail of Items	Qty.
1.	2 ME, 32 Input and 16 Output Multi-format Digital Video Production Switcher with redundant power supply for Main frame.	4 Sets
2.	2 ME, 24 directly accessible cross point Control panel with redundant power supply and 30 mtr. Control cable with suitable connector at both ends.	4 Sets
3.	External high resolution touch screen menu panel of minimum approximately 14 inch to 17 inch of diagonal size (if required).	4 Sets
4.	Operation manual/User Guide/ Technical Manual/ Installation Manual etc.	4 Sets
5.	Service & Maintenance Manuals	4 Sets
6.	Training as per clause no. 9 of specifications	1 Job



आर. वेंकटेश / R. VENKATESH
निदेशक (अभि) / DIRECTOR (ENGINEERING)

Appendix-II**EQUIPMENT IS BEING PROCURED FOR THE FOLLOWING
DOORDARSHAN CENTRES**

Sr. Nos.	Zone	Location of Doordarshan Centre	Qty.
1.	North Zone (NZ)	Lucknow	1 set
2.	East Zone (EZ)	Kolkata	1 set
3.	West Zone (WZ)	Mumbai	1 set
4.		Raipur	1set
		Total Qty.	4 sets



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