



प्रसार भारती  
PRASAR BHARATI  
(Broadcasting Corporation of India)  
दूरदर्शन महानिदेशालय  
Directorate General: Doordarshan  
दूरदर्शन भवन, कोपरनिकस मार्ग,  
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नई दिल्ली - ११०००१  
New Delhi - 110 001

**File No. 19(2)2018-19E1 (P) TV**

**Dated: 15.05.2019**

**Subject:** Draft Technical Specification for Procurement of 3 M/E High Definition (HD) Digital Production Switcher.

The Draft specification of the upcoming tenders is enclosed herewith to offer comments, if any and may also submit their budgetary quote by due date at e-mail address [ddpurchase401@yahoo.co.in](mailto:ddpurchase401@yahoo.co.in) or on following Address:


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Room No. 403,  
Directorate General: Doordarshan,  
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Specification For: Draft Technical Specification for Procurement of 3 M/E High Definition (HD) Digital Production Switcher.

Specification no: SD 06/2019 Dated: 14.05.2019

Due Date to offer Comments: 29.05.2019

Encl.: As above (09 Pages)

  
15/05/19  
Prabhat Kumar Singh  
Assistant Engineer  
For DG: DD

PRASAR BHARATI  
India's Public Service Broadcaster  
DIRECTORATE GENERAL: DOORDARSHAN

**SPECIFICATIONS FOR PROCUREMENT OF 3 M/E HIGH DEFINITION (HD)  
DIGITAL PRODUCTION SWITCHER**

Specifications No.: SD 06/2019  
Dated: 14.05.2019

**1. SCOPE:-**

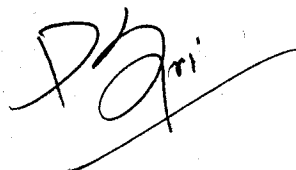
These specifications lay down the required performance characteristics of broadcast quality 48 Input 3 M/E High Definition (HD) Digital Video Production Switcher with 3 M/E control panel having 32 Cross points. The Switcher will be used in Doordarshan Network for live production/transmission of News, Sports and other events of national importance.

**2. ESSENTIAL REQUIREMENTS:-**

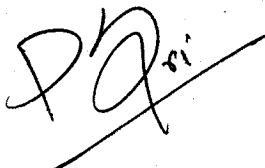
- 2.1 Offered product should be from an internationally reputed manufacturer and the quoted model should be field proven and in use by leading broadcasters. The bidder should essentially submit the list of the broadcasters to whom the quoted model has been supplied. The tenders without the proper user list shall liable to be rejected.
- 2.2 The switcher should Support both High Definition format (16:9 Aspect Ratio) and Standard Definition format (16:9 and 4:3 Aspect Ratio).
- 2.3 Production Switcher should be future ready with support for 4K & IP.
- 2.4 The switcher should be perfectly designed for mission critical applications. It should therefore be equipped with auto switchable redundant power supplies for frame and control panel.
- 2.5 The Switcher mainframe should be able to support Multi-panel operation. It should be able to connect and operate more than one control panel to the Switcher mainframe to run multiple productions simultaneously.
- 2.6 The switcher should have three distinct full function multi-format M/Es and Each M/E should have 8 nos. of built-in keyers along with modifier.
- 2.7 All the keyers should have linear key, luminance key and Chroma key, mask, matt, fill and key invert.



- 2.8 Each M/E should have wipe generators with pattern generators having possibility to modify various wipes with softness, position, aspect ratio, rotation, multiplication, modulation, border width, border softness and border color etc.
- 2.9 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.
- 2.10 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.
- 2.11 It should be possible to take the output of an ME and use it as the background or key on the other ME.
- 2.12 The switcher should have 48 video inputs supporting SD-SDI and HD-SDI formats. Out of 48 video inputs at least 16 inputs should be multi-format and should have internal format conversion.
- 2.13 The switcher should have 24 nos. outputs including Auxiliary Outputs. Out of 24 video outputs at least 16 outputs should be multi-format and should have internal format conversion.
- 2.14 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.
- 2.15 The switcher should be equipped with minimum of twelve window resizer with 2.5D/3D DVE manipulations capable of image resize, movement, rotation, perspective and changes in aspect ratio and reposition independently.
- 2.16 The switcher should at least 4 channels of Internal Frame Memory to store & recall at least 4500 frames (180 seconds) 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.
- 2.17 It should be possible to import/record audio, video and graphics images into the internal frame memory. It should be possible to play audio independently as well as married with video/graphics clips from the internal frame memory. It should also be possible to create transition/wipes using graphics from the frame memory with audio.
- 2.18 The switcher should facilitate transition from the on-air video to a new video through cut, mix (dissolve), wipe and DVE. Transition should take place manually by T-bar fader as well as automatically by button. Auto transition should be possible at desired speed in term of frames and seconds.

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- 2.19 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.
- 2.20 Operational buttons should be well illuminated and should be able to customize the source names for different applications.
- 2.21 Control panel should have minimum 32 directly accessible cross point source buttons in each of the ME Buses. It should have capability to map all the sources to any cross point. The offered control panel should be fully capable of exploiting all the features and functionality as required in the specifications for a live production environment such as news and sports etc.
- 2.22 It should be possible to assign a name to each source and should have Mnemonic display to display source name in the control panel with excellent visibility and viewing angles. Remaining source names should be displayed while pressing shift button assigned in first row.
- 2.23 The control panel should be equipped with high resolution touch screen internally or externally having instant functionality selection with intuitive user control. In case of an external touch screen, it should be highly rugged, reliable and industrial grade for use in harsh environment with minimum diagonal size of 14 inch.
- 2.24 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.
- 2.25 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.
- 2.26 The switcher should have facility to indicate non-synchronous source(s), On Air source(s) and failure of power supply unit.
- 2.27 It should have built in format-independent multi-viewer with minimum two independently configurable outputs for production monitoring. It should be capable of storing layouts and recalling the same as per the production requirement with names and tally indicators.
- 2.28 It should be possible to control external devices such as Recorders, Video Server directly from the switcher through suitable broadcast industry standard interfaces.

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- 2.29 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.

- 2.30 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
<b>A.</b>	<b>Video Performance</b>	
1.	Signal processing	: 10 bits, 4:2:2 digital processing for SD & HD
2.	Data Rate	: 270 Mbps for SD-SDI and 1.485 Gbps for HD-SDI
3.	Supported Video Formats	: SMPTE 259M, SMPTE 292 M
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>B.</b>	<b>Input</b>	
1.	Video-input	: 48 nos. conforming to 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
<b>C.</b>	<b>Output</b>	
1.	Video-output	: Minimum 24 nos. conforming to SMPTE 292M (HDTV), SMPTE 259M(SDTV) on 75Ω BNC configurable as Preview, Program dedicated or assignable to any Bus including Auxiliary Bus
<b>D.</b>	<b>Interfaces</b>	
1.	GPI/Tally I/O	: Minimum 48 nos. on D-type
2.	External interface	: RS422, RJ45 Ethernet, USB
<b>E.</b>	<b>Power Supply</b>	: 220 V AC ± 5%, 50 Hz (Two fully independent hot swappable power supplies for Main frame and Control Panel)
<b>F.</b>	<b>Ambient temperature</b>	: 5°C to 40°C

<b>G.</b>	Relative humidity	:	10 to 90% (non-condensing).
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#### 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 duly signed by the bidder in respect of all the points laid down in the specifications should also be submitted along with the bid by the bidder in the above mentioned proforma.

#### 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) With reference to the clause no.8.2 of the "General Terms And Conditions (GTC)" under ANNEXURE-II of tender document, the complete system including all items/equipment should be guaranteed for **three years** of trouble free operation from the date of commissioning. 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) The guarantee should cover all hardware, software and modules of the complete system.

**8. DELIVERY PERIOD:**

The delivery period will be 03 months.

**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 in each Zone. The name of Doordarshan Centre for each of the four zones 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:

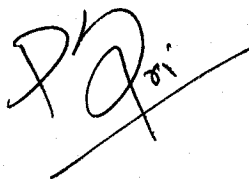
- a) Compliance statement with respect to all the points of the specifications duly signed by the OEM should be submitted for offered equipment/item(s) in the proforma mentioned in clause no. 4.(a). The reference to the page number of enclosed literature for all features and technical specifications 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) Technical manuals/detailed technical literature/catalogues for the offered equipment/item(s) for substantiating the model no. and technical specifications.
- d) Model specific user list of the offered product(s).
- 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.**

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**INDICATIVE BILL OF MATERIAL (BOM) REQUIRED**

<b>Sl. Nos.</b>	<b>Detail of Items</b>	<b>Qty.</b>
1.	3 ME, 48 Input and 24 Output Multi-format Digital Video Production Switcher along with redundant power supplies for Main frame.	4 Sets
2.	3 ME, 32 directly accessible cross point Control panel with redundant power supply along with 30 mtr. Control cable with suitable connector at both ends	4 Sets
3.	Operation manual/User Guide/ Technical Manual/ Installation Manual etc.	4 Sets
4.	Service & Maintenance Manuals	4 Sets
5.	<b>Training-</b> 3 days operation and maintenance training	2 Jobs

## Appendix-II

### EQUIPMENT IS BEING PROCURED FOR THE FOLLOWING DOORDARSHAN CENTRES

Sr. Nos.	Zone	Location of Doordarshan Centre	Qty.
1.	North Zone (NZ)	DD News Delhi	3 Sets
2.		CPC Delhi	1 Set
		<b>TOTAL QTY.</b>	<b>4 Sets</b>

