



सत्यम् शिवम् सुन्दरम्

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

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

Dated: 07.05.2019

Subject: Draft Technical Specification DFA Specification for Procurement of Various Types of Analog & Digital Peripherals.

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


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Specification For: Draft Technical Specification for DFA Specification for Procurement of Various Types of Analog & Digital Peripherals.

Specification no: SD 04/2019 Dated: 06.05.2019

Due Date to offer Comments: 21.05.2019

Encl.: As above (11 Pages)


Prabhat Kumar Singh
Assistant Engineer
For DG: DD

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

**Specifications for Procurement of Various Types of Analog & Digital
Peripherals**

Specifications No.: SD 04/2019

Dated: 06.05.2019

1. SCOPE:

The specifications lay down the performance requirement of the broadcast quality analog & digital peripherals and associated equipment, which are required for TV Studio/OB chain of Doordarshan network. The equipment are to be installed at different TV Studios/OB Van in Doordarshan Network for processing of audio and video signals. The following types of peripheral equipment are required:-

Sr. No.	Item Description
1.	Digital Video Distribution Amplifier (DVDA)
2.	Digital Video Distribution Amplifier (DVDA) with Re-clocking Outputs
3.	Analog Video Distribution Amplifier (AVDA)
4.	Analog Audio & SDI Video Multiplexer Unit (Embedder)
5.	Analog Audio & SDI Video De-multiplexer unit (De-embedder)
6.	19" Rack Frame mounting with hot swappable redundant power supply unit to hold minimum 10 nos. of different cards.

2. GENERAL:

- (a) The offered equipment should be from an internationally renowned manufacturer and the quoted model should be field proven and in use by leading broadcasters in various continents of the world. The bidder should essentially submit the list of the broadcasters to whom the quoted model has been supplied.
- (b) Any substandard equipment included in the offer may cause the rejection of complete offer with the sole responsibility of bidder.
- (c) **The bidders are required to offer their products against all the items as listed in the indicative bill of materials (BoM) under Appendix-I, otherwise the offer shall not be considered for procurement.** The bidder is required to provide the complete list of items & accessories etc. offered to meet the specification requirement in the following proforma:

Specifications for Various Types of Analog & Digital Peripherals: SD 04/2019 Dt.06.05.2019

Page 1 of 11



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

- (d) The list of Doordarshan centers for which the equipment are being procured is as given in **Appendix-II**.
- (e) In order to keep the symmetry and to maintain inter-changeability, all the items must be from same manufacturer. **Items from different manufacturers will not be acceptable.**
- (f) The offered product shall be modular in construction and card type. It should be offered along with the 19" frame/housing with hot swappable redundant power supply unit.
- (g) **The offered product should be capable of monitoring the performance of individual module/card by using SNMP or any other industry accepted interface. It should be possible to adjust parameters of the different peripheral equipment mounted in the rack frame from a remote PC or any other similar device.** The necessary hardware and software interface should be quoted as **optional** item.

3. GENERAL TECHNICAL SPECIFICATIONS:

All the offered items except Analog Video Distribution Amplifier (AVDA) should meet the following specifications, wherever applicable:-

Sr. No.	Parameter	Performance
1.	Standard	
(a)	HDTV	1920x1080/50/I (16:9 aspect ratio) conforming to SMPTE 292M and ITU-R BT. 709 (CIF) (amended upto date)
(b)	SDTV	625/50i (4:3 aspect ratio) conforming to SMPTE 259M and ITU-R BT. 601(amended upto date) (SDI: 270 Mb/s)
2.	Digital Processing	
(c)	Sampling ratio	4:2:2
(d)	Sampling rate (Y/Cb/Cr)	For SD SDI-13.5/6.75/6.75 MHz For HD-SDI-74.25/37.125/37.125

		MHz
(e)	Quantization	10 bit or better
(f)	Data rate	HD-SDI: 1.485 Gb/s SD-SDI: 270 Mb/s
3.	Input/output Handling	Minimum 10 bit or better
4.	Connectors	
(a)	Video	BNC as per IEC 61169-8
(b)	Control	BNC, Mini XLR, RS-422 or GPI.
5.	Signal	
(a)	Input/output SDI signal Level	0.8 Vp-p \pm 10% across 75 Ω /BNC
(b)	SDI Output Jitter	For SD-SDI ≤ 0.2 UI (10Hz) / ≤ 0.2 UI (1KHz), For HD-SDI ≤ 1.0 UI (10Hz) / ≤ 0.2 UI (100KHz)
6.	Operating temperature	5° to 40° Celsius
7.	Rack frame	Standard 19 inches Rack Mounting frame/ housing to hold 10 different cards with hot swappable redundant power supply unit
8.	Power Supply	230 \pm 5% Volts, 50 Hz

4. TECHNICAL SPECIFICATIONS FOR VARIOUS TYPES OF PERIPHERAL EQUIPMENTS

4.1 Detailed Technical Specifications for Digital Video Distribution Amplifier (DVDA)

- 1) It should provide automatic equalized output.
- 2) The offered product should auto detect the defined standard of video input signal.
- 3) Monitoring software should allow management of all the signal paths.
- 4) It should ensure no cross channel loading effects.
- 5) Visual indicators should also give its status about power supply, input etc.

6) Brief Technical Specifications

(a) Input	:	1 x HD/SD- SDI
(b) Output	:	7 or more x HD/SD- SDI
(c) Processing		
(i) Input Equalisation	:	Minimum 100 m @1.5 Gb/s & minimum 300m @270 Mb/s for Belden 1694A

Signature

		or equivalent cable
(ii) Return Loss	:	>15 dB up to 1.5 Gb/s

4.2 Detailed Technical Specifications for Digital Video Distribution Amplifier (DVDA) with Re-clocking Outputs

- 1) It should provide re-clocked outputs.
- 2) The offered product should auto detect the defined standard of video input signal.
- 3) Monitoring software should allow management of all the signal paths.
- 4) It should ensure no cross channel loading effects.
- 5) Visual indicators should also give its status about power supply, input etc.

6) Brief Technical Specifications

(a) Input	:	1 x HD/SD- SDI
(b) Output	:	7 or more x HD/SD- SDI
(c) Processing		
(i) Input Equalisation	:	Minimum 100 m @1.5 Gb/s & minimum 300m @270 Mb/s for Belden 1694A or equivalent cable
(ii) Return Loss	:	>15 dB up to 1.5 Gb/s

4.3 Detailed Technical Specifications for Analog Video Distribution Amplifier (AVDA)

- 1) It should support analog standard definition signal.
- 2) It should be able to provide high quality cable equalization to the input signal up to the length of 300 m of Belden 8281 cable or equivalent.
- 3) It should provide adjustable gain range.
- 4) There should be excellent isolation between the outputs.
- 5) It should have high common mode rejection ratio.
- 6) Monitoring software should allow configuration and status of the card.
- 7) AVDA is to be used in digital system to distribute color black reference and Tri-level sync.
- 8) Visual indicators should also give its status about power supply, input etc.



9) Brief Technical Specifications

Sr. No.	Parameter	Performance
1.	Standard	
(a)	Analog	PAL, 2:1 interlace 625 lines, 25 frames, 50 fields.
2.	Input	1 No.
a	Impedance	75 Ω
b	Signal Level	nominal 1 Vp-p \pm 3 dB
3.	Processing:	
a	Gain Range	\pm 3 dB or better
b	Delay	< 20 ns or less
c	Differential Gain	< 0.3 % or better
d	Differential Phase	< 0.3° or better
e	Frequency response	\pm 0.2 dB up to 10 MHz or better
f	Signal to Noise Ratio	>60 dB or better (un-weighted)
4.	Connectors	BNC as per IEC 61169-8
5.	Output	6 Nos. or more
(c)	Isolation	\geq 40 dB to 10 MHz or better
6.	Operating temperature	5° to 40° Celsius
7.	Rack frame	Standard 19 inches Rack Mounting frame/ housing to hold minimum 10 nos. of different cards with hot swappable redundant power supply unit
8.	Power Supply	230 \pm 5% Volts, 50 Hz

4.4 Detailed Technical Specifications for Analog Audio & SDI Video Multiplexer Unit (Embedder)

- 1) The offered product should auto detect the defined standard of video input signal.
- 2) It should be able to provide programmable audio delay for lip sync issues.
- 3) The offered Embedder should have excellent performance features like "high Input impedance", "flat frequency response", "very low total harmonic distortion" and "extremely high signal to noise ratio (S/N)".
- 4) It should be able to remove all available audio before embedding or allow overwriting with channel shuffling.

- 5) It should be able provide high quality cable equalization to the input signal up to the length of minimum 100 m @1.5 Gb/s & 300m @270 Mb/s for Belden 1694A or equivalent cable
- 6) Monitoring software should allow configuration and status of the card.
- 7) Visual indicators should also give its status about power supply, input etc.

8) **Brief Technical Specifications**

(a) Input:		
i.	Analog Audio Inputs	: 4 or more analog balanced audio with high input impedance >12 K Ω and maximum inputs level of 24 dBu
ii.	Serial digital video Input	: 1 no. HD/SD-SDI
(b) Output:		
i.	No. of Outputs	: 1 or more HD/SD-SDI signal with Embedded audio
(c) Processing:		
i.	Audio processing	: 24 bits or more, 48 kHz sampling
ii.	Audio Frequency Response	: ± 0.1 dB (20 Hz to 20KHz) or better
iii.	THD (Audio)	: < 0.005% (20 Hz to 20KHz) or better
iv.	Channel phase difference	: $\pm 1^\circ$ or better
v.	Audio Delay	: Equal to Video Delay
vi.	Serial input & output return loss	: > 15 dB up to 1.5 GHz

4.5 **Detailed Technical Specifications for Analog Audio & SDI Video De-multiplexer unit (De-Embedder)**

- 1) The offered product should auto detect the defined standard of video input signal.
- 2) It should be able provide audio delay for lip sync issues.
- 3) It should give balanced audio output with low impedance.
- 4) It should be able provide high quality cable equalization to the input signal up to the length of Minimum 100 m @1.5 Gb/s & 300m @270 Mb/s for Belden 1694A or equivalent cable

5) Monitoring software should allow configuration and status of the card.

6) Visual indicators should also give its status about power supply, input etc.

7) Brief Technical Specifications

(a) Input:		
	Input	: 1 or more HD/SD-SDI SDI signal
(b) Output:		
i.	SDI Video Outputs	: 1 or more
ii.	Analog Audio Outputs	: 4 or more balanced output
(c) Processing:		
i.	Audio processing	: 24 bits or more, 48 kHz sampling
ii.	Audio Frequency Response	: ± 0.1 dB (20 Hz to 20KHz) or better
iii.	Audio (THD + noise)	: < -90 dB at 1 kHz or better
iv.	Cross talk	: < -110 dB (20 Hz to 20KHz) or better
v.	Audio Signal Level	: +22dBm on 600 Ω or better
vi.	Serial input & output return loss	: > 10 dB up to 1.5 GHz

5. ACCESSORIES:

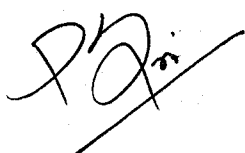
All the essential accessories like power cables, power supply units, software and special type of connectors etc. required to complete the system should be offered by the firm and the firm should certify the completeness of the system. All the **optional items** should also be quoted separately. The firm must provide enough details about such optional items to decide its utility.

6. SOFTWARE:

All the necessary software required for proper working of the system is to be supplied in original and should be licensed to Doordarshan with perpetual validity.

7. 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.

8. 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.

9. 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.

10. 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.

11. DELIVERY PERIOD:

The delivery period will be 03 months.

12. INSPECTION:

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

13. 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. 7.(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. 7.(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.
- 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.



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

Sr. No.	Details of Items per set	Qty.
1.	Digital Video Distribution Amplifier	8 Nos.
2.	Digital Video Distribution Amplifier (with Re-clocking)	2 Nos.
3.	Analog Video Distribution Amplifier	2 Nos.
4.	Analog Audio & SDI Video Multiplexer Unit (Embedder)	2 Nos.
5.	Analog Audio & SDI Video De-multiplexer unit (De-Embedder)	2 Nos.
6.	19" Rack Frame mounting with auto switchable redundant power supply unit.	2 Nos.
7.	Operation manual/User Guide/ Technical Manual/ Installation Manual etc.	1 Set

TOTAL QUANTITY REQUIRED: 35 Sets

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

Sr. Nos.	Zone	Location of Doordarshan Centre	Qty.
1.	North Zone (NZ)	Jaipur	2 Sets
2.		Jalandhar	1 Set
3.		Lucknow	1 Set
4.		Srinagar	1 Set
5.		Dehradun	1 Set
6.		DD News Delhi	6 Sets
7.		CPC Delhi	2 Sets
8.	East Zone (EZ)	Bhubaneswar	2 Set
9.		Kolkata	2 Set
10.		Patna	2 Set
11.		Guwahati	1 Set
12.		Ranchi	1 Set
13.	West Zone (WZ)	Ahmedabad	1 Set
14.		Bhopal	2 Set
15.		Mumbai	1 Set
16.		Raipur	1 set
17.	South Zone (SZ)	Bengaluru	2 Set
18.		Chennai	2 Set
19.		Hyderabad	2 Set
20.		Thiruvananthapuram	1 Set
21.		Vijayawada	1 Set
		TOTAL QTY.	35 Sets

