

Through PB website

PRASAR BHARTI
(India's Public Service Broadcaster)
Director General : Doordarshan
Doordarshan Bhawan, Copernicus Marg
New Delhi -110001.

Dated: 13/07/2022

Subject: Draft Technical Specifications for 3G, HD-SDI Camera Channels (Upgraded to UHD) including Camera Chains, Lenses, Camera Support Systems and HOFs.

The Draft specification of the upcoming tender is enclosed herewith to offer comments, if any by prospective bidders/Firms/OEMs.

2. Bidders/OEMs are requested to provide information about available local content (Make in India) in respect of items listed in suggestive BOM along with budgetary quote.

3. Bidders may please submit the above detail on or before due date by e-mail to ddpurchase401@yahoo.co.in or at following Address.

Assistant Engineer
Room No. 403,
Directorate General: Doordarshan,
Doordarshan Bhawan, Copernicus Marg,
New Delhi -110001 (India)
Telephone: **011- 2311 4401/4403**

Specification For: Draft Technical Specifications for 3G, HD-SDI Camera Channels (Upgraded to UHD) including Camera Chains, Lenses, Camera Support Systems and HOFs.

Specification no: SD 06/2022 Dated 11/07/2022.

Due Date to offer Comments: 27.07.2022

Encl.: As above (10 Pages)

Signed by Girish Kumar
Date: 13-07-2022 14:33:01
Reason: Approved

(Girish Kumar)
Assistant Director (Engg)
Doordarshan Directorate: Doordarshan

PRASAR BHARTI
BROADCASTING CORPORATION OF INDIA
DIRECTORATE GENERAL: DOORDARSHAN

**Specifications for 3G, HD-SDI Camera Channels (Upgraded to UHD)
including Camera Chains, Lenses, Camera Support Systems and HOFCS**

DD Specifications No.: SD 06/2022

Dated: 11.07.2022

1. SCOPE

The specifications outlined in this document aim at the procurement of broadcast quality HD Camera Chains (Upgraded to UHD via Base Stations), Broadcast quality UHD lenses, Camera Support Systems and HOFCS for broadcast applications in Doordarshan's network.

2. ESSENTIAL FEATURES

Camera Chains:

- I. Each Camera Chain should be enabled for 3G, UHD and HDR. It should consist of a Camera Head, Fibre Adaptor, Camera Control Unit, Remote Control Panel, 7" - 7.4" Colour Studio View Finder equipped with LED backlit LCD panel supporting HD resolution, View Finder Hood, HOFCS of 50 metres or above with Lemo/Lemo type Connectors terminated at both ends.
- II. All offered Cameras should be of the same brand and model number. They should be of broadcast quality and have 3 X 2/3" CMOS sensors, 1920 x 1080 or better native resolution sensors supporting HDTV Standard with 60 dB or better S/N Ratio, 800 Horizontal TV Lines or better and 16:9 Aspect Ratio. The CCU should be able to offer upconverted UHD single link 12G SDI output.
- III. Each Camera should support High Dynamic Range (HDR): HLG & SLog-3 as well as Wide Colour Gamut/Space (WCG).
- IV. Each Camera should have a focus assist function in order to ensure accurate and fine focus adjustments through the View Finder.
- V. Each Camera should be enabled with a real time self-diagnostic system for checking and displaying the working of various circuits in the View Finder and a display of the same in the RCP.

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- VI. Each Camera should be enabled with a software control panel which can be operated with a workstation or off the shelf available pads to control all Cameras.
- VII. The Camera Heads should be connected to CCU/Base Stations via Hybrid Optical Fibre Cables which are terminated at both ends with Lemo/Lemo type Connectors.
- VIII. Bi-Directional Signal routing between the Camera Heads and the Base Stations/CCUs should be enabled with IP routing via a Telco network to support live remote production.
- IX. Each Camera Head should be equipped with motorized ND filter wheel and Optical/Electronic Color Correction (ECC) filters. Both filters should be remotely controllable from the RCP.
- X. Besides 3G (1920x1080p), UHDTV (3840 x 2160/ 50p 4:2:2(YCbCr), the Base Station/ CCU should also provide 12G-SDI and SMPTE-2110 IP) Video Output, HDTV (1080/50i & 1080/50p) outputs.
- XI. Each RCP should be Joystick Type having full control over Camera settings. It should also display f-number, filter position, etc. and be of 1/4 19" rack size.
- XII. View Finders should have front and rear Tally Lamps. The rear Tally Lamps should be bright and large enough to ensure clear visibility from all angles. View Finders should draw power supply from Camera Heads.
- XIII. Each Camera Chain should be supplied with one dual muff headset.

Lenses:

- XIV. Each Camera Chain should be accompanied with one Broadcast Quality EFP UHD Digital Zoom Lens either (a) 23X or higher magnification (minimum focal length 7.6 to 7.8 mm) with built in 2X Zoom Extender, Servo Zoom and Servo Focus with a hard carrying case.

Or

(b) 14X or higher magnification UHD Wide Angle Lens (minimum focal length varying from 4.3 to 4.5 mm) with 2X built in extender; Servo Focus and Servo Zoom with quick zoom facility with a hard carrying case.

The total quantity of these two different types of lenses is specified in the chart later in this document.

Camera Support Systems:

- XV. Each Camera should be accompanied with one Camera Support System consisting of a Head, a Tripod and a Dolly. The Head should

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be fluid and capable of holding a payload of at least 30 kg at a 150 mm Centre of Gravity over the full tilt range of +/- 90 Degrees with perfect functional counterbalance. The Tripod should be Two Stage, Carbon Fibre. An accompanying Dolly on which the tripod legs shall be mounted is to be a part of this Camera Support System.

3. Compliance:

- Authorization from the principal manufacturers should also necessarily be submitted along with the bid.
- A point by point full compliance statement in respect of all parameters from the principal manufacturers in the format given below, is to be part of the bid. Mere signature on the copy of DD specifications shall not be accepted as a compliance statement.

The above information should be supported by technical literature/ data sheets enclosed with the bid. Reference to the page number should be mentioned in the relevant column. Bids without compliance statement or with incomplete compliance statement are liable to be rejected at the sole responsibility of the bidder. Any deviation from specifications detailed in the compliance statement is to be highlighted separately.

Sr. No of DD specs.	DD specs.	Compliance (Yes/No)	Performance Fig. of equipment	Reference to the Page Number of enclosed literature	Deviations, in case of non-compliance	Optional items, if any, required to make the system Compliant to DD specs.	Features in the offered Product which exceed DD specs.	Remarks, if any
1.	2.	3.	4.	5.	6.	7.	8.	9.

- A separate point by point compliance statement duly signed by the bidder in respect of all points laid down in the specifications for all equipment should be submitted as part of the bid in the above mentioned proforma.
- An indicative Bill of Material required can be seen in **Appendix-I**. The bidder is required to provide a complete list of equipment including accessories offered to comply with the specifications in the following proforma:

S.No.	Description/Name of the item	Brand	Model	Part No., if any	Qty.	Remarks

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(e) The equipment is being procured for various Doordarshan Centres (Consignees) as mentioned in **Appendix-II**.

4. DOCUMENTATION:

One set of technical and operation & maintenance manuals electronically for all equipment is to be submitted along with the bid to facilitate the technical evaluation, otherwise the bid is liable to be ignored. The successful bidder will have to supply a similar set of operation, service and maintenance manuals.

5. DELIVERY PERIOD:

The delivery period will be 03 months from the date of placement of order.

6. WARRANTY:

- The system should carry a Warranty of three years from the date of accepted consignment at the Consignee's premises. In the eventuality of any equipment including software failing during this period, such fault shall need to be rectified or the relevant part / equipment replaced free of cost to Doordarshan. The OEMs will be required to give an undertaking to this effect along with the bid.
- After Sales Service / Support for an additional 02 (two) years for repairs/maintenance/replacement of the offered system after the completion of warranty period should also be provided. The OEM will need to give an undertaking to this effect along with the bid.
- Warranty should cover all hardware and software.
- Bidders are required to submit details of After Sales Service arrangements for the equipment including that of infrastructural facilities available in India.

7. DEMONSTRATION:

If necessary, the firm may be asked for demonstration of the offered system/s as part of the technical evaluation. In such case the firm will have to make suitable arrangements for demonstration of the offered system at Doordarshan Bhawan, New Delhi or in Delhi/ NCR on notice of a maximum of 15 days.

8. INSPECTION:

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

9. Training:

Cost of three days comprehensive operation and maintenance training at Delhi should be included in the financial bid.

The schedule for training has to be submitted at least one week in advance by the successful bidder.

Training is not part of the Delivery period.

10. 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. 3 (b). Reference to the page number of enclosed literature for all features and technical specifications should be 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 in the Proforma mentioned in clause no. 3 (c).
- (c) Authorization from principal manufacturer mentioned in Clause no. 3 (a).
- (d) Undertaking for three years warranty from OEM for the offered system as mentioned in Clause 6 (a).
- (e) Undertaking for After Sales Service / Support for an additional 2 (two) years for repairs/maintenance of the offered system after the completion of warranty period as mentioned in Clause 6 (b) by the OEM.
- (f) Complete details of After Sales Service arrangements in respect of the offered equipment available in the country mentioned in clause no. 6 (d).
- (g) Technical manuals/detailed technical literature/catalogues for the offered equipment for substantiating the technical specifications.
- (h) Model specific user list of the offered product.
- (i) 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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GENERAL TECHNICAL SPECIFICATIONS

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1.	Camera Channels (as specified above)	<p>: UHDTV: 3840x2160/50/P conforming to SMPTE 2082-10 and ITU-R BT. 2020 (amended up to date) (UHD-SDI: 11.88 Gb/s) from Base Station</p> <p>HDTV: 1920x1080/50/I/P conforming to SMPTE 292M, SMPTE 424M and ITU-R BT. 709 (CIF) (amended up to date) (HD-SDI: 3 Gbps & 1.485 Gb/s) and</p> <p>SDTV: 625/50i (16:9 aspect ratio) conforming to SMPTE 259M and ITU-R BT. 601(amended up to date) (SDI: 270 Mb/s, PAL, 2:1 Interlace, 25 frames/s, 50 fields/s).</p> <p>Video in both the systems should be associated with embedded audio.</p>
2.	Digital Processing	<p>: HDTV: 4:2:2, Y: 74.25 MHz, Pr: 37.125 MHz, Pb: 37.125 MHz Sampling rate, 10 bit quantization.</p> <p>SDTV: 4:2:2, Y: 13.5 MHz, Pr: 6.75 MHz, Pb: 6.75 MHz Sampling rate, 10 bit quantization.</p>
3.	Power Supplies	: 230 Volts \pm10 %, 50 Hz
4.	Pickup Devices	: 3 Chip, 2/3-inch CMOS
5.	Spectrum Systems	F1.4 Prism System
6.	Lens Mounts	2/3-inch type Bayonet Mounts
7.	HDR Options	HLG & SLog-3
8.	Operating Temperature	: 5 to 40 Degrees Celsius
9.	Relative Humidity	: 30% to 85%
10.	Mounting/Dimensions	: Standard 19" Rack mount in case of Stand alone Units or 19" Rack mounting frame housing the units.
11.	Connectors	
a)	Video	: BNC 75 Ω
b)	Audio	: 2 Channels XLR type: 3-pin, female; BNC 75 Ω
c)	Control	: BNC/Mini XLR/RS-422/GPI/Ethernet as applicable
12.	Video Signals	

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a)	Digital Video	:	0.8 V p-p \pm 10%, across 75 Ohms.
b)	Reference Signals	:	Tri-level Sync and Black Burst
13.	Audio		(a) Analog
			(b) AES (Internal or through external convertors)
II.(A)	Standard Lenses (UHD)	:	23 X or higher magnification (minimum focal length varying from 7.6 to 7.8 mm) with 2X built in Extenders, Servo Zooms and Servo Focuses.
II.(B)	Wide Angle Lenses (UHD)	:	14X or higher magnification Wide Angle Lens (minimum focal length varying from 4.3 to 4.5 mm) with 2X built in extender; Servo Focus and Servo Zoom with quick zoom facility.
III	Camera Support Systems	:	Camera Supports of the same brand and model should include 150 mm Ball Bases, Pan & Tilt Heads, Two Stage Fibre Tripods, OB Dollies and Hard Carrying Cases.

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Appendix-I

Bill of Material (BOM)

Sr. No.	Description	Qty.	Remarks
	Video Equipment consisting of :		
(I)	Camera Chains:		
1.	<p>3G UHD/HD Camera Chains including Base Stations, Camera Control Units with individual RCPs, Tripod Adaptors, 7"-7.4" Colour LCD View Finders equipped with LED backlit LCD Panels having a resolution of 1920(H) x 1080(V) Pixels or better (The View Finder should draw power supply from the Camera Head) and LEMO/LEMO type Connectors for HOFC Cables. Each Camera Chain should be provided with one Hybrid OFC cable with LEMO/LEMO type Connectors on both ends.</p> <p>Each Camera should have the following major specifications:</p> <p>3 X 2/3" CMOS Sensors, 16:9 Aspect Ratio, 1920 x 1080p resolution supporting HDTV Standard with F10 (2000 lx, 3200K, 89.9% reflectance), 60dB S/N Ratio or better, 800 Horizontal TV lines or better, Gain : (-6 dB to + 12 dB).</p> <p>Software for controlling the Camera System from a PC or a tab.</p> <p>Motorized ND filter wheel and Optical/Electronic Colour Correction (ECC) Filters. Both filters should be remotely controllable from the RCP, Bayonet Lens Mounts, Support for High Dynamic Range (HDR):HLG & SLOG-3; Wide Colour Gamut/Space (WCG), IP Direct mode support.</p>	48	

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	19" Rack Mountable Base Stations with LEMO Connectors for HOFC cables.		
2.	Dual Muff Camera Headsets	48	
3.	All other specs as mentioned in this document.	Include d as above	
II	Lenses		
1.	Broadcast Quality EFP UHD Digital Zoom Lenses: 23X or higher magnification (minimum focal length 7.6 to 7.8 mm) with built in 2X Zoom Extenders, Servo Zooms and Servo Focuses with Hard Carrying Cases.	36	
2.	14X or higher magnification UHD Wide Angle Lens (minimum focal length varying from 4.3 to 4.5 mm) with 2X built in extender; Servo Focus and Servo Zoom with quick zoom facility.	12	
III	Camera Support Systems		
1.	Camera Support Systems with 150mm Ball Bases supporting the above mentioned Cameras and EFP type lenses along with Two Stage Carbon Fiber Tripods, OB Dollies, with Hard Carrying Cases.	48	

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Appendix-II**CAMERA CHANEELS TO BE PROVIDED FOR
DOORDARSHAN CENTRES**

Sl. No.	Zone	DD Centre	Camera Chains	UHD Standard Lenses	UHD WA Lens	Camera Support System
1	East Zone	Bhubaneswar	4	3	1	4
2		Kolkata	4	3	1	4
3		Patna	4	3	1	4
4		Guwahati	4	3	1	4
5	West Zone	Ahmedabad	4	3	1	4
6		Mumbai	4	3	1	4
7		Bhopal	4	3	1	4
8	North Zone	Delhi News	4	3	1	4
9		Lucknow	4	3	1	4
10		Jaipur	4	3	1	4
11	South Zone	Bangalore	4	3	1	4
12		Hyderabad	4	3	1	4

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