

Through website

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

Dated: 27/04/2022

Subject: Draft Technical specification for Multi Format Digital Video Waveform Monitor.

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 in respect of the item.

3. Budgetary quote for the said item may also be provided.

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,
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Draft Specification For: Multi Format Digital Video Waveform Monitor.

Specification no: SD 03/2022 Dated: 25.04.2022

Due Date to offer Comments: 11.05.2022

Encl.: As above (09 Pages)

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

Specifications for Multi Format Digital Video Waveform Monitor

Specifications No.: SD 03/2022

Dated: 25.04.2022

1. SCOPE:

The specifications lay down the performance requirement of UHD, HD, SD-SDI Waveform Monitor for precise measurement and monitoring of Digital Video signal in Doordarshan Network.

2. GENERAL:

- (a) **The offered equipment should be from a 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.** The bidder should desist offering a model which is nearing obsolete/End of sale/discontinuation.
- (b) The waveform monitor should have SD-SDI to 12G-SDI Single Link input and EYE and Jitter display & measurement module.
- (c) The Software license required to enable 12G SDI for 4K formats should be offered as an optional Item.
- (d) The Waveform Monitor should be capable of being mounted in a standard 19" rack. The plug-in support/mounting hardware, cabinet etc. should also be quoted.

3. ESSENTIAL FEATURES:

- (a) It should be high precision broadcast digital Video Waveform Monitor to display UHD-SDI, HD-SDI and SD-SDI signals (auto-detecting) with the capability of highly accurate measurement.
- (b) The waveform monitor should have two numbers of inputs (UHD 12G- (Single Link) /HD/SD) in any combination of Ultra High Definition, High Definition and Standard Definition serial digital signals conforming to SMPTE 2082-10 (12G SDI: 11.88 Gb/s), SMPTE 292M (HD-SDI: 1.485 Gb/s) and SMPTE 259M (SD SDI: 270 Mb/s).
- (c) The waveform monitor should display waveform, vector, picture and status. In addition to these basic features, it should measure and monitor Eye pattern & Jitter.

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- (d) The waveform monitor should be able to display the wave form of both the input signals (HD/SD-SDI) simultaneously or the selected input (UHD/HD/SD-SDI), as per the user requirement.
- (e) The Waveform Monitor should have an external Reference Input of Tri-level sync signal or PAL black burst.
- (f) The offered waveform monitor should have re-clocked SDI output of selected input.
- (g) The Waveform Monitor should have a built-in bright and crisp colour touch screen display with a resolution of 1920 x 1080 (HD) for live monitoring.
- (h) The offered waveform monitor should have Overlay display mode to Overlay component signals and Parade mode to display the component signals in side by side.
- (i) The Waveform Monitor should be able to display input signals on a full screen or 4-screen multi displays. The multi screen display should allow various combinations of signals of different inputs to be displayed such as waveform display, vector display, picture display and status display.
- (j) The Waveform Monitor should have safe area, safe action and safe title marker display on the picture display to quickly verify correct placement of graphics, titles or logos.
- (k) The Waveform Monitor should have customizable presets to allow quickly saving commonly used configurations and should be able to store and recall.
- (l) It should be possible to monitor SDI signal errors such as CRC errors of HD-SDI signals and EDH errors of SD-SDI signals as well as errors related to the embedded audio signals and ancillary data.
- (m) The waveform monitor should display the eye patterns and jitter waveforms of the SDI input signals in real time and measure jitter with timing cursors and necessary filters.
- (n) The waveform monitor should automatically measure eye pattern amplitude, rise time & fall time in the eye pattern display, timing jitter and alignment jitter.
- (o) The waveform monitor should be able to analyze and display ancillary data.
- (p) It should be possible to measure the level of the serial digital signal and display as equivalent length of coaxial cable.
- (q) It should be possible to detect transmission errors in the ancillary data.
- (r) The Waveform Monitor should have the feature of Vector display of the color difference signals.
- (s) The Waveform Monitor should have frame capture function and store the video data from an entire video frame and display this captured frame data on waveform, vector, gamut and picture displays.

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- (t) The Waveform Monitor should be able to automatically capture frame data on the occurrence of specific faults or errors.
- (u) The Waveform Monitor should have USB Connector to store the presets and data.
- (v) It should have Ethernet interface with standard RJ-45 connector for remote control and monitoring.
- (w) The indicative Bill of Material (BoM) required is given in **Appendix-I**. The bidder is required to provide the complete list of items & accessories etc. offered to meet the specifications 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. |
| | | | | | |

- (x) The equipment are being procured for various Doordarshan centres (Consignee) as per **Appendix-II**.

4. TECHNICAL SPECIFICATIONS:

4.1 SDI Input

| | | | |
|----|-------------------|---|--|
| 1. | Inputs | : | 2 Nos conforming SMPTE 2082-10 (12G SDI: 11.88 Gb/s), SMPTE 292M (HD-SDI: 1.485 Gb/s) and SMPTE 259M (SD SDI: 270 Mb/s). |
| 2. | Input Connector | : | BNC 75 Ω |
| 3. | Input level | : | 800 mVp-p \pm 10%. |
| 4. | Input Return Loss | : | \geq 15dB (5 MHz to 1.485 GHz) \geq 10dB (1.485 to 2.970 GHz) \geq 4dB (5.940 to 11.880 GHz) |

4.2 SDI Output

| | | | |
|----|------------------|---|--|
| 1. | Signal | : | Serially re-clocked output of the selected input signal. |
| 2. | Output Connector | : | BNC 75 Ω |
| 3. | Output level | : | 800mVp-p \pm 10% |

4.3 External Reference

| | | | |
|----|--------------------|---|--|
| 1. | Input Signal | : | Tri-level sync signal or PAL black burst |
| 2. | Input Connector | : | BNC 75 Ω |
| 3. | DC Input Impedance | : | 15 k Ω |
| 4. | Return loss | : | \geq 30 dB (50 kHz to 30 MHz, 75 Ω termination) |



4.4 Waveform Vertical Characteristics

| | | |
|------|-------------------------|---|
| 1. | Frequency Response - HD | |
| (i) | Luminance Channel (Y) | : $\leq \pm 0.5 \%$ (1 MHz to 30 MHz) |
| (ii) | Chrominance Channel | : $\leq \pm 0.5 \%$ (0.5 MHz to 15 MHz) |
| 2. | Frequency Response - SD | |
| (i) | Luminance Channel (Y) | : $\leq \pm 0.5 \%$ (1 MHz to 5.75 MHz) |
| (ii) | Chrominance Channel | : $\leq \pm 0.5 \%$ (0.5 MHz to 2.75 MHz) |
| 4. | Amplitude Accuracy | : $\leq \pm 0.5 \%$ |
| 4. | Gain | : X1, X5 and X10 |

4.5 Eye Pattern and Jitter Display

| | | |
|----|-------------------------|---|
| 1. | Type | : Equivalent time sampler |
| 2. | Formats | : UHD-SDI conforming to SMPTE 2082-10, HD /SD conforming to SMPTE 292M and SMPTE 259M |
| 3. | Vertical Scale Accuracy | : $800 \text{ mV} \pm 5 \%$ (for 800 mV input) |
| 4. | Jitter filter | : 10 Hz, 1 KHz & 100 KHz |

4.7 Display

| | | |
|----|-------------|------------------------|
| 1. | Screen type | : TFT/LCD touch screen |
| 2. | Resolution | : 1920x1080 or better |
| 3. | Screen Size | : 7" or better |
| 4. | Format | : HD |

4.8 Power Supply & Operating Temperature

| | | |
|----|-----------------------|--------------------------------------|
| 1. | Input | : $230 \pm 5\% \text{ V AC}$, 50 Hz |
| 2. | Operating temperature | : 0 Deg. C to 40 Deg. C |

5. ACCESSORIES:

All essential accessories such as power cables, connectors etc. required to complete the system should be offered by the firm and the firm should certify the completeness of the system in all respect. All the optional items should be quoted separately. The firm must provide enough details about such optional item to decide its utility.

6. COMPLIANCE:

- (a) A point by point full compliance statement in respect to all the parameters related to the concerned equipment/item(s) laid down in the specifications from the respective principal manufacturers 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

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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 for all the equipment/item(s) should also be submitted along with the bid by the bidder in the above mentioned proforma.**
- (c) Authorization from principal manufacturer should also necessarily be submitted along with the bid.

7. TECHNICAL LITERATURE:

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 and installation manuals with respect to each of the equipment in electronic form.

8. 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.

9. 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 failure of any item or equipment including software and hardware within this period, it shall be rectified or replaced free of cost



to Doordarshan. The OEM will be required to give undertaking to this effect along with the bid.

- 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 OEM 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.

10. TRAINING:

The bidder should offer 03 days operation and maintenance online training on the offered equipment for Doordarshan Engineers. The bidder has to provide the comprehensive training material in the form of soft copies to the trainees during the training session.

The training will be conducted **online** in each Zone.

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. 6.(a). The reference to the page number of enclosed literatures 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. 6.(b).
- c) Authorization from principal manufacturer mentioned in clause no. 6.(c).

- d) Undertaking for three years guarantee from OEM for the offered system as mentioned in Clause 9. (a).
- e) 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 as mentioned in Clause 9 (b) from OEM.
- f) Complete details of after sales service arrangements in respect of the offered equipment available in the country mentioned in clause no. 9.(d).
- g) Technical manuals/detailed technical literature/catalogues for the offered equipment/item(s) for substantiating the model no. and 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.



Suggestive Bill of Material

Appendix-1

| Sl Nos. | Details of Items | Qty. |
|---------|---|----------|
| 1. | Dual UHD/HD/SD SDI input Digital Waveform Monitor with Cabinet and power supply. | 148 Nos. |
| 2. | Dual UHD/HD/SD SDI input Digital Waveform Monitor with Cabinet and power supply along with EYE and Jitter Display & Measurement Option | 34 Nos. |
| 3. | 19" Rack mounting arrangement for two Waveform Monitors in each rack frame | 124 Nos. |
| 4. | Blank panel for rack mount frame | 65 Nos. |
| 5. | Operation manual/User Guide/ Technical Manual/ Installation Manual etc. (Soft copy in Pen Drive) | 182 Sets |
| 6. | Service & Maintenance Manuals. (Soft copy in Pen Drive) | 182 Sets |
| 7. | 3 days Operation & Maintenance online Training under Each Zone. | 4 Job |
| 8. | Optional Item | |
| | Software license required to enable 12G SDI for 4K formats. | |



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

| Sl. No. | Zone | Location of Doordarshan Centre | Total Qty. | Item Nos. 1,5 & 6 | Item Nos. 2,5 & 6 | Item No. 3 | Item No. 4 |
|---------|-------------------|--------------------------------|-----------------|-------------------|-------------------|---------------|----------------|
| 1. | East Zone | Bhubaneshwar-DDK | 6 | 5 | 1 | 4 | 2 |
| 2. | | Kolkata- DDK | 9 | 8 | 1 | 6 | 3 |
| 3. | | Patna- DDK | 6 | 5 | 1 | 4 | 2 |
| 4. | | Ranchi- DDK | 6 | 5 | 1 | 4 | 2 |
| 5. | | Guwahati- DDK | 8 | 7 | 1 | 6 | 4 |
| 6. | | Aizwal-DDK | 3 | 2 | 1 | 2 | 1 |
| 7. | | Gangtok-DDK | 3 | 2 | 1 | 2 | 1 |
| 8. | | Imphal-DDK | 3 | 2 | 1 | 2 | 1 |
| 9. | | Itanagar-DDK | 3 | 2 | 1 | 2 | 1 |
| 10. | | Kohima-DDK | 3 | 2 | 1 | 2 | 1 |
| 11. | | Shillong-DDK | 3 | 2 | 1 | 2 | 1 |
| 12. | | Agartala-DDK | 3 | 2 | 1 | 2 | 1 |
| 13. | North Zone | Jalandhar-DDK | 8 | 7 | 1 | 6 | 4 |
| 14. | | Srinagar-DDK | 6 | 5 | 1 | 4 | 2 |
| 15. | | Chandigarh-DDK | 6 | 5 | 1 | 4 | 2 |
| 16. | | Dehradun-DDK | 6 | 5 | 1 | 4 | 2 |
| 17. | | Jaipur-DDK | 6 | 5 | 1 | 4 | 2 |
| 18. | | Lucknow-DDK | 8 | 7 | 1 | 6 | 4 |
| 19. | | Shimla-DDK | 3 | 2 | 1 | 2 | 1 |
| 20. | | Hissar-DDK | 3 | 2 | 1 | 2 | 1 |
| 21. | | Jammu-DDK | 6 | 5 | 1 | 4 | 2 |
| 22. | | Leh-DDK | 3 | 2 | 1 | 2 | 1 |
| 23. | South Zone | Bangalore-DDK | 6 | 5 | 1 | 4 | 2 |
| 24. | | Chennai-DDK | 9 | 8 | 1 | 6 | 3 |
| 25. | | Hyderabad-DDK | 6 | 5 | 1 | 4 | 2 |
| 26. | | Thiruvananthapuram-DDK | 6 | 5 | 1 | 4 | 2 |
| 27. | | Vijaywada-DDK | 6 | 5 | 1 | 4 | 2 |
| 28. | | Port blair-DDK | 3 | 2 | 1 | 2 | 1 |
| 29. | | Puducherry-DDK | 3 | 2 | 1 | 2 | 1 |
| 30. | West Zone | Ahmedabad-DDK | 6 | 5 | 1 | 4 | 2 |
| 31. | | Mumbai-DDK | 8 | 7 | 1 | 6 | 4 |
| 32. | | Bhopal-DDK | 6 | 5 | 1 | 4 | 2 |
| 33. | | Raipur-DDK | 6 | 5 | 1 | 4 | 2 |
| 34. | | Panaji-DDK | 6 | 5 | 1 | 4 | 2 |
| | | TOTAL QTY. | 182 Sets | 148 Nos. | 34Nos | 124Nos | 66 Nos. |

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