

PRASAR BHARTI  
BROADCASTING CORPORATION OF INDIA  
DIRECTORATE GENERAL:DOORDARSHAN

**Specifications for Digital/Analog Waveform Monitor**

Specifications No. : SD 06/2010  
Dated: 19.05.2010

**1. Scope :**

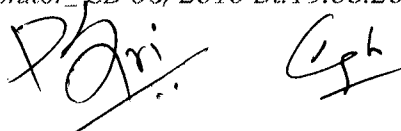
The specifications lay down the performance requirement of Digital/Analog (Standard Definition) Waveform Monitor to be used in TV studios/OB Vans of Doordarshan network.

**2. General Features :**

- (a) The Waveform monitor should be equipped with various modes and trigger functions that are essential for digital video signal monitoring.
- (b) The offered waveform monitors should include the features detailed in these specifications in addition to the standard features that are normally required for serial digital video signal monitoring in the standard broadcast Television Studio.
- (c) These monitors should also be capable of being mounted in a standard 19" rack. The plug-in support/mounting hardware should be quoted as optional accessories.
- (d) The offered Waveform Monitor should have all standard features and also should have flexibility to add-on cards for up gradations in future. The tenderer is required to quote the following options also in addition to the standard configurations:
  - i. Option for Composite Video Monitoring
  - ii. Option of EYE/Jitter measurement etc. in serial digital component mode
  - iii. Option for Audio Monitoring

**3. Essential Features :**

- (a) The firm should offer a high precision, single unit having Digital signal processing capable of highly accurate measurement and high quality Color LCD based broadcast digital Waveform Monitor.
- (b) The waveform monitor should have two selectable inputs to receive two numbers of Standard Definition serial digital (SD SDI) signal with passive



loop through. The format of the digital signal should comply with SMPTE 259M and ITU-R BT 656 standards.

- (c) The offered product should be able to provide real time LCD display suitable for live monitoring.
- (d) The offered product should have the facility to display the waveform in Overlay and parade mode in RGB & Y Pb Pr.
- (e) The waveform monitor should be able to monitor Gamut in RGB & YPbPr.
- (f) The waveform monitor offered should have the picture display function, of the Y video signal on the LCD.
- (g) The waveform monitor should be capable to display four measurements at a time, in almost any combination such as waveform display, vector display, picture display and status display.
- (h) The waveform monitor should offer remote access and control with a standard web-browser.
- (i) The offered waveform monitor should have facility of Eye pattern view of the incoming selected digital video signal with Timing cursors with necessary filters.
- (j) It should be possible to monitor the serial transmission error of the serial digital signal and analyze for the correct format and status by means of EDH codes. It should be possible to measure the level of the serial digital signal and displayed as equivalent length of coaxial cable.
- (k) The offered product should have the feature of Vector/Lightning display of the colour difference signals. The vector should display user selectable graticules, color targets (75% & 100%) and color axis.
- (l) The waveform monitor should capture and store the video data from an entire video frame and display this data on waveform, vector, gamut & picture displays.
- (m) The waveform monitor should be able to do trigger capturing that automatically acquires data on the occurrence of specific faults.
- (n) The waveform monitor should have safe area graticules on the picture display to quickly verify correct placement of graphics, Titles or logos.
- (o) The waveform monitor should be able to store at least 30 presets.
- (p) The Waveform monitor should have USB interface to store the presets.
- (q) It should have 10/100 Base- T Ethernet connection and offer remote access.
- (r) It should have SNMP interface to allow easy integration with network management software.



- (s) All accessories like 19" rack mount kit, cabinet etc. should be quoted separately.
- (t) **The offered equipment should be from an internationally reputed 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.**
- (u) The Bill of material required is given in **Appendix-I (A)**.
- (v) The equipment are being procured for various Doordarshan centres as per **Appendix-II**.

#### 4. Technical Specifications :

##### 4.1 Serial Digital Input



4.1.1	Input	2, SMPTE259M-C, 625/50
4.1.2	Input type	75 Ohm BNC
4.1.3	Input level	800 mVp-p $\pm$ 10%.
4.1.4	Return loss	> 15 dB from 1 MHz to 270 MHz
4.1.5	Receiver equalization range	Up to 250m of type 8281 cable
4.1.6	<b>Waveform Vertical Characteristics</b>	
4.1.6.1	Frequency response	Luminance Channel (Y): $\pm$ 0.5%, 50 KHz to 5.75 MHz.
		Chrominance Channel: $\pm$ 0.5%, 50 KHz to 2.50 MHz
4.1.6.2	Vertical measurement Accuracy	At 1X: $\pm$ 0.5%; at 5X: $\pm$ 0.2% of 700 mV full scale mode.
4.1.6.3	Gain	X1, X5 and X10

##### 4.2 Serial Digital Output

4.2.1	Signal format	270 Mbps
4.2.2	Output level	800mVp-p $\pm$ 10% across 75 Ohms load.
4.2.3	Return loss	> 15 dB, 1 to 270 MHz

##### 4.3 Eye Pattern Display (For Eye Pattern Configuration)

4.3.1	Type	Equivalent time sampler
4.3.2	Data Rate	supported format SMPTE 259M, 270Mbps
4.3.3	Jitter filter	10 Hz, 1 KHz, 10 KHz & 100 KHz
4.3.4	Amplitude accuracy	800 mV $\pm$ 5% for 800 mV input

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#### 4.4 Component Vector Mode

4.4.1	Vertical Bandwidth	800 KHz
4.4.2	Vertical Gain Accuracy	±0.5%
4.4.3	Vertical Gain Accuracy	±0.5%
4.4.4	Vector display	P <sub>b</sub> is displayed on Horizontal axis and P <sub>r</sub> is displayed on vertical axis.

#### 4.5 External Reference

4.5.1	Synchronization	Both, Internal and external synchronization facility
4.5.2	Input type	Black burst, BNC, 75 Ohm
4.5.3	DC Input Impedance	15 K Ohm
4.5.4	Return loss	> 30 dB

#### 4.6 Display

4.6.1	Screen type	LCD
4.6.2	Resolution	1024 x 768
4.6.3	Screen Size	6.3" or better
4.6.4	Format	XGA

#### 4.7 Power Supply & Operating Temperature

4.7.1	Input	230 ±5% V AC, 50 Hz
4.7.2	Operating temperature	0 Deg. C to 40 Deg. C

### 5. COMPLIANCE

- (a) Any substandard equipment included in the offer may cause the rejection of complete offer with the sole responsibility of bidder.
- (b) The firm should provide the offered un-priced bill of material in electronic form also in addition to the hard copy for ease of technical evaluation.
- (c) **A point-by-point compliance statement from the principal manufacturer in respect of all the points laid down in these specifications is to be enclosed along with the offer in the format given below. Mere signature on the copy of the 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.

## **6. 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.

## **7. TRAINING**

The firm should also quote for two days operation & maintenance training on the offered equipment for Doordarshan Engineers. The training will be arranged at the locations given under **Appendix I (B)**.

## **8. DOCUMENTATION**

One set of printed technical and operation & maintenance manuals for all the equipments are to be provided on non-returnable basis along with the tender to facilitate the technical evaluation, otherwise the tender is liable to be ignored. The successful bidder will have to supply one set of printed operation, service and maintenance manuals with respect to each equipment.

## **9. GUARANTEE**

- (a) The system should be guaranteed for two years of trouble free operation from the date of supply. In case of any equipment failure including

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software and hardware within this period, the same shall be rectified or replaced free of cost to Doordarshan.

- (b) The guarantee should cover all hardware, software and modules of the complete system.

## **10. DEMONSTRATION**

If necessary, the firm may be asked for demonstration of the offered system as part of the technical evaluation. In such case the firm will have to make suitable arrangement for the demonstration of the offered system at Doordarshan Bhawan, New Delhi, on notice of 7 days. Accordingly the firm should be in readiness for demonstration on a notice of 7 days.

## **11. INSPECTION**

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

## **12. ENCLOSURES**

The bidder must necessarily submit the following enclosures along with the technical bid:

- (a) Compliance statement with respect to all the points of the specifications duly signed by the OEM.
- (b) 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.
- (c) Technical manuals/Detailed technical literature/catalogues for all the offered products for substantiating the model no. and technical specification.
- (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.**

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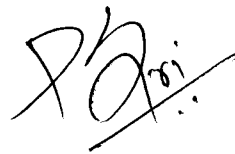
**BILL OF MATERIAL:**

<b>Sl. No.</b>	<b>Details of Item</b>	<b>Total Qty.</b>
1.	Digital Waveform Monitor with Cabinet and rack mounting arrangement	93 Nos.
2.	EYE and Jitter measurement Option	62 Nos.
3.	Composite Video Input Option	31 Nos.
4.	Audio Measurement Option	31 Nos.
5.	Operation manual/User Guide/ Technical Manual/ Installation Manual etc.	93 Sets
6.	Service & Maintenance Manuals	31 Sets
7.	2 days Operation & Maintenance Training	4 lots

**Appendix-I(B)**

**TRAINING LOCATIONS:**

The training will be arranged at four locations, one each in North Zone, South Zone, East Zone and West Zone. The exact locations in the respective zone will be intimated at the time of the offer of the training by the firm.



**EQUIPMENT ARE BEING PROCURED FOR THE FOLLOWING  
DOORDARSHAN CENTRES**

<b>Sl. No.</b>	<b>Zone</b>	<b>Location of Doordarshan Centre</b>	<b>Qty.</b>
1.	<b>North Zone (NZ)</b>	Jammu	3 sets
2.		Chandigarh	3 sets
3.		Bareilly	3 sets
4.		Shimla	3 sets
5.		Allahabad	3 sets
6.		Mau	3 sets
7.	<b>East Zone (EZ)</b>	Daltonganj	3 sets
8.		Mujjafarpur	3 sets
9.		Ranchi	3 sets
10.		PPC Guwahati	3 sets
11.		Siliguri	3 sets
12.		shillong	3 sets
13.		Tura	3 sets
14.		Kohima	3 sets
15.		Itanagar	3 sets
16.		Imphal	3 sets
17.		Silchar	3 sets
18.		Dibrugarh	3 sets
19.		Aizwal	3 sets
20.		Agartala	3 sets
21.	Sambalpur	3 sets	
22.	Gangtok	3 sets	
23.	<b>South Zone (SZ)</b>	Gulbarga	3 sets
24.		Pondicherry	3 sets
25.		Vijayavada	3 sets
26.		Portblair	3 sets
27.	<b>West Zone (WZ)</b>	Panaji	3 sets
28.		Raipur	3 sets
29.		Rajkot	3 sets
30.		Pune	3 sets
31.		Indore	3 sets
<b>TOTAL</b>			<b>93 Sets</b>

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