

### Specifications for Digital/ Analogue Waveform Monitor

#### 1. Scope:

The specification lays down the performance requirement of Digital/ Analogue (Standard Definition) Waveform monitor to be used in TV Studios of Doordarshan network.

#### 2. General Features:

- 2.1 The Waveform monitor should be equipped with various modes and trigger functions that are essential for digital video signal monitoring.
- 2.2 The offered waveform monitor should include the features detailed in this specification in addition to the standard features that are normally required for serial digital video signal monitoring in the standard broadcast Television studio.
- 2.3 These monitors should also be capable of being mounted in a standard 19-inch rack. The plug-in support/ mounting hardware should be quoted as optional accessory.
- 2.4 The offered Waveform Monitor should have all standard features and also should have flexibility to add-on cards for up gradation in future. The tenderer are required to quote the following options also in addition to the standard configurations:
  - 2.4.1 Option for Composite Video Monitoring.
  - 2.4.1 Option of Eye/Jitter measurement etc. in serial digital component mode.
  - 2.4.1 Option for Audio Monitoring.

#### 3. Essential Features:

- 3.1 The firm should offer high precision, single units having digital signal processing capable of highly accurate measurement and high quality Color LCD based broadcast digital Waveform Monitor.
- 3.2 The waveform monitor should have two selectable inputs to receive two numbers of Standard Definition serial digital signals. The formats of the digital signal comply with SMPTE 259M-C and ITU-R656 standards.
- 3.3 The offered product should be able to provide real time LCD display suitable for live monitoring.
- 3.4 The offered waveform monitor should have the facility to display the waveform in Overlay and Parade mode in RGB and YP<sub>b</sub>P<sub>r</sub>.



- 3.5 The Waveform Monitor should be able to monitor Gamut in RGB and YP<sub>b</sub>P<sub>r</sub>.
- 3.6 The waveform monitor offered should have the picture display function of the video signal on the LCD.
- 3.7 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.
- 3.8 The Waveform Monitor should offer remote access and control with a standard Web-browser.
- 3.9 The offered waveform monitor should facilitate Eye pattern view of the incoming selected digital video signal with timing cursors with necessary filters. (with Eye pattern optional configuration)
- 3.10 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.
- 3.11 It should be possible to measure the level of the serial digital signal and displayed as equivalent length of coaxial cable.
- 3.12 The offered product should have the feature of Vector/Lightning display of the color difference signals. The vector should display user-selectable graticules, color targets (75% and 100%) and color axis.
- 3.13 The Waveform Monitor should capture and store the video data from an entire video frame and display this data on waveform, vector, gamut and picture displays.
- 3.14 The Waveform Monitor should be able to do trigger capturing that automatically acquires data on the occurrence of specific faults.
- 3.15 The Waveform Monitor should have safe area graticules on the picture display to quickly verify correct placement of graphics, Titles or logos.
- 3.16 The Waveform Monitor should be able to store at least 30 presets.
- 3.17 The Waveform Monitor should have USB Connector at the front to store the presets.
- 3.18 It should have 10/100 Base-T Ethernet connection and offer remote access
- 3.19 It should have SNMP interface to allow easy integration with network management software.
- 3.20 All accessories like 19" rack mount kit, cabinet etc, should be quoted separately in this offer.
- 3.21 Only **internationally reputed** make and model meeting the following specification should be quoted. The firm should enclose the user list of the broadcasters to whom this product has been supplied.



#### 4. Technical Specifications:

##### 4.1 Serial Digital Input

4.1.1	Input	2, SMPTE259M-C, 625/50
4.1.2	Input Type	75 $\Omega$ 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	Waveform Vertical Characteristics	
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	800 mVp-p $\pm$ 10% across 75 $\Omega$ load
4.2.3	Return loss	15 dB, 1 – 270 MHz

##### 4.3 Eye pattern Display (For Eye pattern configuration)

4.2.1	Type	Equivalent Time sampler
4.2.2	Data Rate	Supported format SMPTE 259M, 270 Mbps
4.2.3	Jitter Filter	10 Hz, 1 KHz, 10 KHz & 100 KHz
4.2.4	Amplitude accuracy	800 mV $\pm$ 5% for 800 mV input

##### 4.4 Component Vector Mode

4.4.1	Vertical Bandwidth	800 KHz
4.4.2	Vertical Gain Accuracy	$\pm$ 0.5%
4.4.3	Horizontal Gain Accuracy	$\pm$ 0.5%
4.4.4	Vector Display	$P_B$ is displayed on Horizontal axis and $P_R$ 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 $\Omega$
4.5.3	DC Input Impedance	15 k $\Omega$
4.5.4	Return Loss	$\geq$ 30 dB.

##### 4.6 Display

4.6.1	Screen Type:	Color LCD
4.6.2	Resolution:	1024 X 768
4.6.3	Size:	6.3"
4.6.4	Format:	XGA
4.6.5	Screen:	1 – screen, 2 – screen and 4 – screen display

#### 4.7 Power supply & operating temperature

4.7.1	Input	100 to 240 VAC, 50 Hz
4.7.2	Operating Temperature	0° to 40°C

#### 5. Compliance:

A point-by-point compliance statement from the principal manufacturer in respect of all the points laid down in this specification is to be enclosed along with the offer in the format given below. Mere signature on the copy of our specification shall not be accepted as a compliance statement.

Compliance statement in the format mentioned below shall only be accepted. The manufacturer should also record the performance figures of their equipment offered in the quote for which the compliance statement is enclosed. **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 incomplete compliance statement will be rejected with the sole responsibility of the tenderer.** Any deviation from the specification detailed in the compliance statement is to be highlighted separately.

S. No of DD Specs.	DD Specs.	Compliance (Yes/No)	Performance Fig. of eqpt. 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 Sys. Offered Which exceed DD Specs.

#### 6. Accessories:

All the 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. Firm must provide enough details about such optional items to decide its utility.

#### 7. Training:

2 days training on operation and maintenance of the offered system for Engineers at a designated location in India should also be offered with the bid.

#### 8. Documentation:

One set of user guide and Technical Manual for operation and Maintenance should be provided along with the tender for technical evaluation purpose, on non-returnable basis. Offers without the technical manuals for evaluation, are liable to be rejected with sole responsibility of the bidder. The successful bidder has to supply one set of Technical Manual for operation and Maintenance along with the equipment. The cost, if any, for these manuals may be indicated in their offer.

**9. Demonstration:**

The equipment offered may be required to be demonstrated at Doordarshan Bhawan, New Delhi for compliance of the required features, as a part of tender evaluation process. The firm should arrange the necessary equipment required for the demonstration within a stipulated period.

**10. Spares:**

The firm should quote for all the essential spares that are required for the smooth functioning of the system for at least five years after the guarantee period is over.

**11. Price:**

The tenderer must quote separately item wise price of all the items that constitute the system. Prices of all the optional items should also be quoted separately.

**12. Guarantee:**

The equipment should be guaranteed for at least two years of trouble free operation from the date of supply. In case of any failure within the guarantee period the equipment should immediately be replaced/repaired free of cost.

**13. Enclosures:**

The firm must submit the following enclosures along with the tender to facilitate technical evaluation:

- 13.1 Point to point compliance statement duly signed by the OEM. The OEM should essentially fill the performance figure of the offered product in the compliance statement. 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.
- 13.2 Technical manuals/Detailed technical literature/catalogues for all the offered products for substantiating the technical specification.
- 13.3 Product specific user list of the offered product/system.
- 13.4 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 tenderer.

