



**MADURAI KAMARAJ UNIVERSITY**  
**(University with Potential for Excellence)**  
**Madurai – 625 021 – TAMILNADU, INDIA**



**GLOBAL TENDER NOTIFICATION**

**Ref: No.01/EMRC/MKU/TENDER-1/2017-2018**

Sealed Tenders are invited for the supply and installation of Professional Broadcast Video and other Equipments.

Tender document and other details can be downloaded from **1. [www.mkuniversity.org](http://www.mkuniversity.org)**  
**2. [www.tenders.tn.gov.in](http://www.tenders.tn.gov.in)**

|  |              |                       |
|--|--------------|-----------------------|
| The cost of tender document            | : Rs.2,950/- | ( Rs.2500+Rs.450 GST) |
| Last date for submission of the tender | : 23.10.2017 | Time: 10.30 a.m.      |
| Opening of Technical Bid               | : 23.10.2017 | Time: 4.00 p.m.       |

**Dr.V.Chinniah**  
**Registrar i/c**

Date: 27.09.2017

Place: Madurai – 625 021.

Phone No.: 0452-2459455,0452-2459148 ; Fax : 0452-2459181,0452-2459145

Cost Rs.2950/- (Rs.2500+450 GST)

**TENDER FORM**

**Reference No:**                      **Technical Bid**

Date: .....

Description of Item: **SUPPLY AND INSTALLATION OF PROFESSIONAL BROADCAST VIDEO AND OTHER EQUIPMENTS**

Consignee:    The Registrar, Madurai Kamaraj University, Madurai-625 021, Tamilnadu, India : Attn: The Director, EMRC, Madurai Kamaraj University, Madurai-625 021.

Place of Commissioning: EMRC, Madurai Kamaraj University, Madurai-625 021, Tamilnadu, India

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F.No:

From

M/s. ....

.....

.....

**To**

**The Registrar,  
Madurai Kamaraj University,  
Madurai – 625 021, Tamilnadu, India.**

Sir,

With reference to your Global Tender Notice dated ....., we offer our technical and commercial bid for the supply and installation of the following professional video equipment:

| Sl.No. | Name of equipment                               | Quantity |
|--------|---|----------|
| 1      | 2/3" Camcorder with lens and accessories        | 1        |
| 2      | Recorders/Players 50 GB (Optical) or equivalent | 2        |
| 3      | HDI/SDI Video Production Switcher               | 1        |
| 4      | Studio Lights                                   | 1 set    |
| 5      | Tripod  | 2 nos    |
| 6      | Video production Storage/server                 | 1 set    |
| 7      | 8 Input Audio Mixer                             | 1        |
| 8      | Virtual Studio set up                           | 1        |
| 9      | Teleprompter                                    | 1        |
| 10     | LCD Monitors 14", 20" & 30" (3 each)            | 1 set    |
| 11     | LCD Monitors 40"                                | 1 no.    |
| 12     | Amplify Speakers                                | 1        |
| 13     | MPEG4 Encoder & Decoder                         | 1        |
| 14     | Waveform Monitor                                | 1        |
| 15     | Genset 125 KV silent                            | 1        |

**N.B.:** If required, separate sheets may be added to give more technical details of equipments details. These should be on the letter heads of tenderer duly stamped and signed.

| Sl. No. | Details of Payment  | D.D. No. & Date | Name of the Bank & Place | Amount Rs.             |
|---------|---------------------|-----------------|--------------------------|------------------------|
| 1.      | Cost of Application |                 |                          | 2950/- (2500+450 GST)  |
| 2.      | EMD                 |                 |                          | 1% of the Tender value |

**Note: The Demand Draft for cost of application and EMD should be enclosed with Technical Bid cover.**

Authorized Signatory \*

Name:

Designation:

(\* Authorized signatory should be the same at all places in the Tender/Offer)

**TENDER FORM – COMMERCIAL BID**

**FOR THE SUPPLY OF PROFESSIONAL BROADCAST VIDEO AND OTHER  
EQUIPMENTS**

Name of the Company/Firm :

Address :

Phone/Fax Numbers/E-mail ID :

Name of Indian representative :

Address :

Phone/Fax Numbers/E-mail ID :

Price of the system conforming to  
required specifications :

(Prices of the main system and of different accessories must be quoted separately; insurance and air-freight charges upto Madurai, Tamilnadu should be mentioned, warranty period should be mentioned)

Date:

Signature with seal of the authorized person of the Firm

## 1) Specifications for SD / HD switchable Tapeless Camcorder

Digital camcorder system should conform to HDTV 1920x1080/50/I (16:9 aspect ratio) conforming to SMPTE 292M and ITU 709 (CIF) HD-SDI: 1.485 Gb/s and SDTV 625/50 (4:3 aspect ratio) conforming to SMPTE 259M and ITU 601 SDI: 270 Mb/s. Both the signals should have 4:2:2 sampling and 10 bit quantization and embedded audio. The recording should be on a tape less medium of 50 GB or better & capable of recording @ 25 & 50Mbps with all the required standard accessories and optional accessories as needed to enhance the performance of equipment to the optimum level.

The basic specifications are as follows: -

| <b>General Specifications</b>        | <b>Detail:</b>  |
|--------------------------------------|---|
| Power Requirements                   | DC 12 V +5.0 V/-1.0 V   |
| Video Recording Format               | MPEG HD422 (MPEG-2 422P@HL) (CBR: 50 Mb/s)<br>MPEG HD (MPEG-2 MP@HL):<br>HQ mode (VBR, maximum bit rate: 35 Mb/s)<br>SP mode (CBR, 25 Mb/s)<br>LP mode (VBR, maximum bit rate: 18 Mb/s) (Playback only)<br>MPEG IMX (MPEG-2 422P@ML) (50/40/30 Mb/s)<br>DVCAM (CBR,25 Mb/s) |
| Proxy Video                          | MPEG-4<br><br>DVCAM<br>25 Mb/s: Approx. 185 min. (PFD50DLA), Approx. 85 min. (PFD23A)   |
| <b>Inputs/Outputs Specifications</b> | <b>Detail:</b>  |
| Genlock In                           | BNC x1, 1.0 Vp-p, 75 Ω  |
| TC IN                                | BNC x1, 0.5 to 18 Vp-p, 10 kΩ   |
| SDI IN                               | BNC x 1<br>(HD/SD switchable)<br>HD-SDI: SMPTE 292M (w/embedded audio)<br>SD-SDI: SMPTE 259M (w/embedded audio)   |
| Audio In                             | CH-1/CH-2: XLR 3-pin (female) x 2, line/mic/mic +48 V selectable  |
| AES/EBU Input                        | CH-1/CH-2: XLR 3-pin (female) x 2, AES/EBU selectable   |
| MIC In                               | XLR 5-pin (female, stereo) x 1  |
| Test Out                             | BNC x 1<br>(switchable)<br>HD Y/SD composite<br>SD composite (character On/Off)   |
| SDI Out                              | BNC x 2<br>1 (HD/SD switchable)<br>HD-SDI: SMPTE 292M (w/embedded audio)<br>SD-SDI: SMPTE 259M (w/embedded audio)<br>2 (HD/SD switchable, character On/Off)   |
| Audio Out                            | CH-1/CH-2: XLR 5-pin (male, stereo) x 1   |
| TC Out                               | BNC x 1, 1.0 Vp-p, 75 Ω   |
| Earphone                             | Mini-jack x 2 (front: monaural, rear: stereo/monaural)  |
| Monitor Speaker                      | YES   |
| DC In                                | XLR 4-pin (male) x 1, 11 to 17 V  |
| DC Out                               | 4-pin (Female) (for wireless microphone receiver), 11 to 17 V DC, MAX. 500 mA   |

|                  |  |
|------------------|--|
| Lens Connector   | 12-pin   |
| Remote           | 8-pin  |
| Light            | 2-pin, DC 12 V, max. 50 W                              |
| Camera Adaptor   | 50-pin   |
| i.Link           | IEEE 1394, 6 pin x 1, File Access Mode                 |
| Memory Stick     | x 1 (for camera setup files)                           |
| Gigabit Ethernet | RJ-45 x 1, 100Base-Tx: IEEE802.3u, 10Base-T: IEEE802.3 |
| USB              | x 1 (for version-up)                                   |

#### **Audio Performance Specifications**

#### **Detail:**

|                    |  |
|--------------------|--|
| Frequency Response | 20 Hz to 20 kHz, +0.5/-1.0 dB                |
| Dynamic Range      | More than 93 dB                              |
| Distortion         | Less than 0.08% (at 1 kHz, reference level)  |
| Crosstalk          | Less than -70 dB (at 1 kHz, reference level) |
| Wow & Flutter      | Below measurable limit                       |
| Headroom           | 20/18/16/12 dB (selectable)                  |

#### **Camera Section Specifications**

#### **Detail:**

|  |  |
|--|--|
| Pickup Device                            | 3-chip 2/3-inch type CCD / CMOS  |
| Effective Picture Elements               | 1920(H) x 1080(V)  |
| Optical System                           | F1.4 prism   |
| Built-In Optical Filters                 | 1: Clear, 2: 1/4ND, 3: 1/16ND, 4: 1/64ND<br>A: CROSS, B: 3200K, C: 4300K, D: 6300K   |
| Shutter Speed (Time)                     | 1080/59.94i: 1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000,ECS,SLS<br>1080/50i: 1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000,ECS,SLS<br>1080/29.97P:1/40, 1/60, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/2000,ECS,SLS<br>1080/25p: 1/33, 1/50, 1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000,ECS,SLS<br>1080/23.98p: 1/32,1/48, 1/50,1/60,1/96, 1/125, 1/250, 1/500, 1/1000,<br>1/2000,ECS,SLS<br>720/23.98p( pull down) : 1/32,1/48, 1/50,1/60,1/96, 1/125, 1/250, 1/500,<br>1/1000, 1/2000,ECS,SLS |
| Slow Shutter                             | 1- to 8- and 16-frame accumulation   |
| Sensitivity (2000 lx, 89.9% reflectance) | F11 @ 59.94i, F12 @ 50i (typical)  |
| Minimum Illumination                     | Approx. 0.016 lx (F1.4 lens, +42 dB, with 16-frame accumulation)   |
| Gain Selection                           | -6, -3, 0, 3, 6, 9, 12, 18, 24, 30, 36, 42 dB  |
| Smear Level                              | -135 dB (typical)  |
| S/N Ratio                                | 59 dB (54 dB w/o Noise Suppressor)   |
| Horizontal Resolution                    | 1000 TV lines or more (1920 x 1080i mode)  |
| Registration                             | Less than 0.02%  |
| Modulation Depth                         | 45% or more at 27.5MHz   |

#### **Monitoring Specifications**

#### **Detail:**

|                      |                                 |
|----------------------|---------------------------------|
| Viewfinder           | Option                          |
| Built-In LCD Monitor | 3.5-inch type color LCD monitor |

#### **Lens Specifications**

#### **Detail:**

|            |  |
|------------|--|
| Lens Mount | 2/3-inch type bayonet mount                      |
| Lens Mount | 2/3-inch-type 48 bayonet mount                   |
| Lens       | Standard Zoom Lens with 22x zoom and 2x extender |

**2) Studio HD/SD, Professional Recorder/Player or equivalent  
(To support existing optical Disk format work flow)**

**FEATURES**

- Recording Bit Rates: MPEG-2 422p@HL format - Bit rate is 50Mbps for both 1080 and 720 - Audio Format 24 bit x 8ch
- Multi-Format Support: DVCAM, MPEG IMX® 30/40/50 Mbps, MPEG HD 420 18\*/25/35Mbps should be supported for both recording and playback as standard.
- Record Time: Longer recording time with the Dual Layer and Single Layer Professional Disc Media.
- Power supply: AC / DC / Battery
- Tilt up front panel: 3.5-inch color LCD Widescreen
- Dual Optical Pick-up, Thumbnail Search function, Expand function, Equipped with a Jog/Shuttle Dial
- The conversion in Playback mode: Down conversion from HD to SD, Up conversion from SD to HD, Cross conversion between 1080 and 720 should be possible
- Front panel operation using the function keys & multi-dial 9 pin video control remote, RS-422A control for linear editing player
- Clip Continuous REC

**SPECIFICATIONS**

**Inputs/Outputs**

|                                   |  |
|-----------------------------------|--|
| HD/SDI IN BNC x 1<br>(switchable) | HD-SDI: SMPTE 292M (w/embedded audio)<br>SD-SDI: SMPTE 259M (w/embedded audio)   |
| REF.VIDEO IN                      | BNC x 2 (including loop through),<br>HD Tri-level sync (0.6 Vp-p/75 Ω/negative)<br>or SD black burst/composite sync (0.286 Vp-p/75 Ω/negative) |
| ANALOG AUDIO IN<br>balanced       | XLR 3-pin (female) x 2, +6 dBu, Hi-Z,  |
| DIGITAL AUDIO (AES/EBU) IN        | 1/2, 3/4 BNC x 2, 4 ch (2 ch each, 1/2 ch and 3/4 ch),<br>AES-3id-1995   |
| TIME CODE IN                      | BNC x 1, SMPTE time code, 0.5 to 18 Vp-p/3.3<br>kΩ/unbalanced  |
| HDSDI OUT 1                       | BNC x 1, SMPTE 292M (w/embedded audio)   |
| HDSDI OUT 2 (SUPER)               | BNC x 1, SMPTE 292M (w/embedded audio),<br>character On/Off  |
| SDSDI OUT 1                       | BNC x 1, SMPTE 259M (w/embedded audio)   |
| SDSDI OUT 2 (SUPER)               | BNC x 1, SMPTE 259M (w/embedded audio),<br>character On/Off  |
| COMPOSITE OUT 1                   | BNC x 1, 1.0 Vp-p/75 Ω/negative, SMPTE 170M  |
| COMPOSITE OUT 2 (SUPER)           | BNC x 1, 1.0 Vp-p/75 Ω/negative, SMPTE 170M,<br>character On/Off   |
| ANALOG AUDIO OUT                  | XLR 3-pin (male) x 2, +4 dBu, 600Ω, Lo-Z, balanced   |
| AUDIO MONITOR                     | XLR 3-pin (male) x 2, +4 dBu, 600Ω, Lo-Z, balanced   |
| DIGITAL AUDIO<br>(AES/EBU) OUT    | 1/2, 3/4 BNC x 2, 4 ch (2 ch each, 1/2 ch and 3/4 ch),<br>AES-3id-1995   |
| TIME CODE OUT                     | BNC x 1, SMPTE time code, 1.0 Vp-p/75  |
| Ω/unbalanced                      |  |
| PHONES                            | Stereo phone-jack x 1  |

|               |   |
|---------------|---|
| i.LINK S400   | 6-pin x 1*1 File Access Mode  |
| HDV*2         | 1080i/720P  |
| ETHERNET      | RJ-45 x 1, 1000Base-T: IEEE802.3ab, 100Base-TX: IEEE802.3u, 10Base-T: IEEE802.5 |
| REMOTE (9P)   | D-sub 9-pin (female) x 1, RS-422A   |
| VIDEO CONTROL | D-sub 9-pin (female) x 1, EIA RS-423  |
| AC IN x 1,    | 100 to 240 V  |
| DC IN         | 12V XLR 4-pin (male) x 1  |
| REMOTE        | 4-pin (female) x 1, DC 12 V, 7.5 W  |
| MAINTENANCE   | USB x 2   |

### Video Performance

|                                      |   |
|--------------------------------------|---|
| Sampling frequency                   | Y: 74.25 MHz, Pb/Pr: 37.125MHz                        |
| Quantization                         | 8 bit/sample  |
| Compression                          | MPEG-2 4:2:2P@HL                                      |
| Composite output Frequency response: | 0.5 to 5.75 MHz +0.5 dB/-2.0 dB                       |
| S/N(Y):                              | 53 dB or more Y/C delay: $\pm 20$ ns or less K-factor |
| (K2T):                               | 1% or less  |

### Processor Adjustment Range

|                          |                            |
|--------------------------|----------------------------|
| Video level              | $-\infty$ to +3 dB         |
| Chroma level             | $-\infty$ to +3 dB         |
| Set up/black level       | $\pm 30$ IRE/ $\pm 210$ mV |
| Chroma phase             | $\pm 30^\circ$             |
| System sync phase        | $\pm 15 \mu\text{s}$       |
| System sync phase (fine) | 0 to 400 ns                |

### Audio Performance

|                    |                                 |
|--------------------|---------------------------------|
| Sampling frequency | 48 kHz                          |
| Quantization       | 24 bit                          |
| Frequency response | 20 Hz to 20 kHz +0.5 dB/-1.0 dB |
| Dynamic range      | 90 dB or more                   |
| Distortion         | 0.05% or less                   |
| Headroom           | 12/16/18/20 dB (selectable)     |

|                               |                                   |
|-------------------------------|-----------------------------------|
| <b>Built-in LCD Monitor</b>   | 4.3-inch*3 type color LCD monitor |
| <b>Built-in Audio Speaker</b> |                                   |



### 3. Specifications for Digital Video Production Switcher

|  |
|--|
| <b>Processor Specifications</b>  |
| <b>INPUT</b>   |
| Video – Input : Minimum 16 Input conforming to SMPTE292M (HDTV), SMPTE 259 M-C (SDTV). |
| Reference Input : SDTV Analog black burst/Analog sync, HD Tri-level sync on 75 Ohm.    |
| <b>OUTPUT</b>  |
| Video Output : Minimum 16 no. of outputs are detailed below:                           |
| 12 x Assignable output   |
| 4 x Selectable output  |
| <b>CONTROL</b>   |
| LAN – RJ- 45   |
| Remote 1 – D-sub 9 pin   |
| Remote 2 – D-sub 9 pin   |
| Tally/GPI - D Type 25 pin  |
| Serial tally – D-sub 9 pin   |
| FM device – USB 2.0 or better  |
| S- BUS – BNC, 75 ohms  |
| <b>CONTROL PANEL Specifications</b>  |
| LAN – RJ-45  |
| USB – USB 2.0 or better  |
| External Display – DVI-D Out (SVGA 600 x 800 only)                                     |

- These specifications lay down the required performance characteristics of broadcast quality minimum 16 input 1.5 M/E Digital Video Production Switcher with control panel and touch panel.
- It should have facility of re-entry of M/E into PGM/PST with extensive layering capability.
- The offered equipment should be from an internationally reputed manufacturer.
- The switcher should have 16 video input or more supporting SD-SDI and HD-SDI formats. The control panel should have 16 or more source selection buttons (cross point buttons) in each row.
- Each source button should have a complete modifiable display to customize the source names for different applications.
- It should have capability to map all the internal or external sources to any cross point.
- It should have facility to store and recall the complex sequences of the switcher operations through a single button. It should also have internal memory along with external media interface like USB/Hard disk etc. to store and recall the effects.
- Switcher should have 4 Keyers on each M/E and can be used as (Luminance, Linear, Chroma, Color Vector and key wipe pattern key) and/or Picture in Picture.

- Every Keyer should have Chroma Key Capability and possible to move and magnify/shrink the key using a resizer or using DME/DVE.
- 2Keyers per ME has 2.5D resize and Resizer not only Resize, Locate, Rotate but also Defocus and Mosaic etc.
- 2 CH are available for 3D Effects.
- CG Wipe engine on each M/E offering animated wipe/mix transitions.
- Switcher should have 8frame memory Channelsthat can be used to output the still and clip file.
- Switcher shouldstore up to 1000 Full HD framesand switcher should capable to store Still, Video or Embedded audio with Video.
- 2 x Multi-viewer outputs in SD/HD Mode, each with selectable layouts.
- Standard interface for multiple external device control, including routers, and VTR/VDCP units via RS-422.
- 16 inputs are standard, expandable to 32 with optional HD/SD-SDI card.
- It should have 16 outputs are standard with at least 12 assignable and 4 selectable outputs.
- Dedicated REF/Sync Input should be available.
- Switcher is capable with 12 AUX Output and can do the Primary Color Correction as well as AUX MIX Transition between the Auxes.
- Key Transitions like (CUT, MIX, WIPE, DME Wipe, NAM, CLIP transition, Super MIX, and ColorMIX) with KEY Priority will be available for switching.
- Switcher can store up to 250 Macro, 99 key frames, 99 Snapshot and 99 Shot Box.
- Switcher is equipped with dedicated Menu Touch Panel to operate Menu function in easy way few are Engineering Setup, M/E setup, Store and recall Frame memory, Timeline like operations.
- Should have Menu touch panel with some assignable buttons.

#### 4) Studio Lighting System

##### A. KEY LIGHTS (HALOGEN) – 2 each

1. **1000 Watts Baby** Fresnel spot light complete with imported fresnel lens of 112 mm , **1000** watts halogen lamp single ended, reflector, handle, focus defocus(1'-2' Adjustable hanger) , heat resistant powder coating black in black in color, 5m of 3-core cable with following accessories:
  - a. 4 Leaf barn door
  - b. Filter Frame
  - c. C-clamps complete with 28mm stud(Stirrup) & safety chain.
  - d. Yoke
  
2. **650 Watts Baby** Fresnel spot light complete with imported fresnel lens of 112 mm , 650 watts halogen lamp single ended, reflector, handle, focus defocus(1'-2' Adjustable hanger) , heat resistant powder coating black in black in color, 5m of 3-core cable with following accessories:
  - a. 4 Leaf barn door
  - b. Filter Frame
  - c. C-clamps complete with 28mm stud(Stirrup) & safety chain.
  - d. Yoke

##### B. FILL/FLOOD LIGHTS (COOL LIGHTS) Compact size preferably Arri or Equivalent - 4 each

1. **2x55 W (110 watts) DIMMABLE COOLITE** complete with two numbers of lamps , electronic control gear, reflector, Intensifier, holder, lamp clamps, handle, On/off , on light dimming, Analog/DMX Dimming Controls, 12-foot of 3 core cable with Compatible Connector; safety cable inclusive of following accessories:
  - a. 4 Leaf barn doors with intensifier.
  - b. Filter Frame
  - c. C-clamps complete with 28mm stud & safety chain.
  - d. *Yoke*
  - e. Honey Comb Filter (Medium)
  
2. **4 x 55 W (220watts) DIMMABLE COOL LIGHT** complete with 4 nos. of lamps 55 watt , electronic control gear, reflector, holder, lamp clamps, handle, On/off , On Light dimming, DMX Control , analogue dimming, 3-m of 3 core cable with open end inclusive of following accessories:
  - a. 4 Leaf barn doors with intensifier
  - b. Filter Frame
  - c. C-clamps complete with 28mm stud & safety chain.
  - d. *Yoke*
  - e. *Honey Comb Filter (Medium)*

##### C. Dimming Console Panel

###### 1. Porta Kit - 4 numbers

Triple Fixture Baby Base Kit Light Weight, 42 Watt Triple Tube Lamps provided complete with folding kit stands, lamps, power cords, mounting adapters and soft case with separate compartments for lights.

#### **D. Spare Lamps**

1. Lamps 1000 Watts Halogen For Baby Light
2. Lamps 650 Watts Halogen For Baby Light
3. Lamps 55 W for Cool lights
4. Lamps 42 Watts for Porta Kits

#### **5. Specifications for Tripod for Outdoor Camcorder**

|                  |  |
|------------------|--|
| Height:          | 15 cm  |
| Length:          | 14.8 cm  |
| Width:           | 17.2 cm  |
| Weight:          | 3.2 kg   |
| Capacity Range:  | 7 to 20 kg / 15.4 to 44.1 lbs                            |
| Tilt Range:      | ±90°   |
| Ball Base:       | 100 mm   |
| Pan Bar:         | Single telescopic  |
| Camera Fixing:   | Two-way sliding plate with 2 x 3/8" camera fixing screws |
| Leveling Bubble: | Illuminated  |
| Drag Knobs:      | Backlit and calibrated                                   |
| Counterbalance:  | Fully variable with digital readout                      |
| Stability:       | Mid-spread Locking                                       |

#### **6. Specification for Production Server**

| <b>1</b>   | <b>Integrated NLE cum VIDEO SERVER</b>   |       |
|------------|--|-------|
| <b>A-1</b> | Broadcast Quality Production Servers with SAN architecture capable of real-time editing of high resolution media files, Gigabit Ethernet networking for client connectivity, 2 Nos. reversible I/O configurations, 4:2:2 SMPT/CCIR-B, 625/50, 10 bit processing, redundant power supply, redundant fans, mounting frame etc. | 1 lot |
| <b>A-2</b> | To achieve record/play Bit rate from 20-250Mbps and operate with any standard codec as available in mainstream Non-Linear editing systems, on MJPEG, IMX file formats.   |       |
| <b>A-3</b> | The system should have high internal bandwidth (>1Gbps) and capable of Mix & wipe transitions with 12 bit processing.  |       |
| <b>A-4</b> | The Server should be connected/networked with NLE's numbering up to six and be able to work efficiently with native file exchange with a number of NLE system of different make already available with the Centres, such as Leitch Velocity.   |       |

|            |   |        |
|------------|---|--------|
| <b>A-5</b> | The supplier should provide networking of the Server with 6 points and more comprising of NLE terminals/ preview / Publishing etc., N/w with a distance upto 100m each line, lossless with a bandwidth of 1GB and each terminal capable of independently and simultaneously editing the content directly from the server and dragging and dumping the content in either direction.  |        |
| <b>A-6</b> | The server should have simple management tools and be able to be administrated across the network. Redundant Internal storage for high resolution ingesting (up to 480Mbps), with RAID5 or RAID6 to ensure adequate protection of all data. The effective storage capacity of 3 TB and more and 8 channel of audio and VBI with mounting frame, redundant power supply, redundant fans etc. Uncompressed SD and uncompressed HD capability. |        |
| <b>A-7</b> | The storage system should be capable of being upgraded by adding larger drives or by adding additional storage Servers/Media at any time.   |        |
| <b>A-8</b> | The additional Server/Media should be capable of being managed through the one GUI. Redundant OS drive available as option desirable.   |        |
| <b>2.</b>  | <b>Miscellaneous Equipment Quote separately</b>   |        |
| <b>A</b>   | 8x8 SDI router complete with redundant power supplies, mounting frame, automation control, other required interfaces and XY remote control panels.  | 1 lot  |
| <b>B</b>   | Ethernet Switches with redundancy   | 2 lot  |
| <b>C</b>   | 17" TFT monitors  | 2      |
| <b>D</b>   | Device controllers for controlling various devices.   | 1 lot  |
| <b>E</b>   | All installation materials such FC, Ethernet, video, audio, data cables, connectors, harnesses, tie clips etc.  | 1 lot  |
| <b>F</b>   | Dual Head phones of standard make   | 4 Nos. |
| <b>H</b>   | All other peripheral equipment such as ADAs, VDAs, converters, multiplexers, de-multiplexers as per the system requirement.   | 2 Nos. |
| <b>I</b>   | Required software and work stations   | 1 lot  |
| <b>J</b>   | Application software  | 1 lot  |
| <b>K</b>   | Software for data protection, management and control, networking  | 1 lot  |
| <b>L</b>   | Other engineering components including spare drives.  | 1 lot  |
| <b>M</b>   | Frame Sync. With audio embedding. Composite , Component , DV & SDI input with SDI output  | 2 nos. |
| <b>N</b>   | Audio 8 channels of non-compressed audio @ 24-bit / 48 KHz per video channel  |        |
| <b>O</b>   | LCD Video monitors 14"  | 2      |
| <b>P</b>   | SDI Video/Audio monitoring station similar to wholer  | 1 no.  |
| <b>3.</b>  | <b>Installation &amp; Commissioning, Training &amp; Pre-shipment Inspection</b>   |        |
| <b>A</b>   | Installation and commissioning of the System  | 1 lot  |
| <b>B</b>   | Training as per the details given in the specification  | 1 lot  |
| <b>C</b>   | Pre-shipment Inspection   | 1 lot  |

|   |  |       |
|---|--|-------|
| <b>D</b>  | Annual Maintenance Contract as defined in the specification. | 1 lot |
| <b>OTHER TERMS AND CONDITIONS:</b>  |  |       |
| <ol style="list-style-type: none"> <li>1. <b>These specifications are indicative only. User on its discretion may select better system design, configuration, make, model and specification if available and quoted.</b></li> <li>2. <b>The tenderer should submit quotation for with 2 years of warranty and comprehensive maintenance contract up to 5 years, of entire equipment supplied, to be applicable after the warranty period is over.</b></li> <li>3. <b>The Entire System is to be quoted on turn key basis including supply, Installation (at Media Centres located at 17 Cities), with supply of one or more NLE systems and it's testing, commissioning.</b></li> <li>4. <b>User training to be organised for three Days for Networking and Four days for NLE at central location Delhi. Four days Maintenance &amp; operational Server Training at each Media Centre.</b></li> <li>5. <b>The tenderer should submit quotation for AMC of the equipment supplied that is applicable after the warranty period is over.</b></li> <li>6. <b>User reserves the right to buy the selected system fully or partially.</b></li> </ol> |  |       |

## **7. Specification for 8 Channel Audio Mixer**

The system has to be professional, compact sound reinforcement console designed for a wide range of applications with installed and portable sound systems.

The modular construction, with input modules in blocks of four should provide ease of servicing and configuration to suit individual applications. Frames should include a versatile master section, combining group and main output masters, monitoring, Matrix outputs and two full stereo input channels.

### **Features:**

- 4-band EQ
- High Pass Filter
- 6 Auxiliary Sends
- Routing to 4 Sub-Groups, Stereo and Mono outputs

### **Frequency Response**

- Any input to any output 20Hz - 20kHz, +0/-0.5dB

### **Total Harmonic Distortion**

- *(All measurements at +20dBu)*
- Line In to Group or Mix out Less than 0.01% @ 1kHz  
Less than 0.025% @ 10kHz

### **Noise**

- *(22Hz-22kHz bandwidth, unweighted)* Less than -128.5dBu
- Mic Input Equivalent Input Noise  
(150 Ohm Source)
- Mix Noise Less than -84 db

### **Cross Talk**

- Mix to Group Output Less than -90 db @ 1 kHz

### **Input and Output Impedances**

- Mic Inputs 1.5 K $\Omega$  balanced
- Hi-Z and Stereo Inputs (0.25" Jack) Greater than 10 K $\Omega$  balanced
- Insert Points 75  $\Omega$ /10 K  $\Omega$  unbalanced
- Aux Outputs 75  $\Omega$  ground compensated
- Group, Mix and Matrix Outputs 75  $\Omega$  balanced

### **Input and Output Levels**

- Mic Input Sensitivity (XLR) -12 dBu to -70 dBu
- Line Input Sensitivity (0.25" jack) +10 dBu to -40 dBu
- Insert Send/Return -2 dBu nominal
- Aux Outputs +4 dBu nominal
- Group, Mix and Matrix Outputs +4 dBu for 0 VU
- PFL Output -2dBu

### **Functional Description**

**Mono Input Module:** It should be with XLR and Jack connectors, 48V phantom Power to the input XLR, SENS and RNGE control adjusts, PHASE, Equaliser with four bands, Auxiliary Sends, Routing, etc.

**Stereo Input Module:** It should be with Sensitivity control adjusts, Equaliser, Auxiliary Sends, Routing etc.

**Matrix Section:** It should be with Group Output etc.

**Master Section:** It should be with Stereo Outputs, Mono Output, Track Return, Monitor and Headphones Outputs, Metering, Talkback, auxiliary Outputs, PFL Outputs etc.

**Power:** AC 220 V/50 Hz

## **8. Specifications for 5 SD- SDI or 4 HD- SDI inputs 3D TRACKLESS VIRTUAL STUDIO SYSTEM**

**SCOPE:** Trackless 5 cameras Virtual Set System is required for CEC and its media centers for talk show, backdrop & also for discussion environment. Virtual set should be easy to operate and user friendly. Vendor/Manufacturer must have supplied Virtual set to other institutions may be authenticated.

### **Essential features:-**

1. The offered equipment should accept SD-SDI and HD-SDI video inputs in PAL video standard. It should support High Definition (HD) and Standard Definition (SD) resolution simultaneously in a single system. The equipment should be able to switch to any supported resolution with the selection of that resolution.
2. The equipment should support SMPTE 259M for SD-SDI and SMPTE 292M for HD- SDI video signal for inputs.
3. The equipment should handle multiple cameras and switching through computer keyboard and dedicated tactile switcher panel.
4. The equipment should have dedicated hardware tactile keyboard panel designed to work with the virtual studio systems. This keyboard should exactly replicates the functions of virtual studio systems.
5. The equipment should have 5 live camera inputs in SD format or 4 live camera inputs in HD format and should be able to simultaneously process, chroma key and display 5 standard definition live video streams with chroma key or 4 high definition live video streams with chroma key in a virtual set and on the live video output in the single screen.
6. The equipment should support three dimensional (3D – non stereoscopic) virtual sets.
7. The equipment should have advanced chroma keying facility per video input channel for all 5 standard definition live video inputs or 4 high definition live video inputs and should be able to simultaneously process all inputs with chroma key and display 5 standard definition live video streams with chroma key or 4 high definition live video streams with chroma key in a virtual set.
8. The equipment should have the built in virtual camera switcher with overlay (swipe) transition between two virtual cameras. It should display channel logo or program id during this transition.
9. The equipment should have Depth of Field (Defocus) facility where the backdrop behind the anchor can be blurred to achieve the realistic look like in the optical camera lens.



10. The equipment should have the facility to integrate external CG through downstream keyers – video fill and key (DSK) inputs utilizing the same video inputs. The CG graphics so integrated should be part of the virtual set environment and move with the virtual camera movement.
11. The equipment should have off line preview facility to provide the look-ahead preview of the virtual camera motions and angles on VGA monitor.
12. The equipment should have in-built gallery for organizing video clips & graphic image files to be used in the virtual set system.
13. The equipment should have in-built 2 digital disk players to play video clips which can be changed dynamically by drag and drop operation on air.
14. The equipment should have the facility to replace pre-defined media images and videos used in the virtual sets from the software application by simple drag and drop operation to do last minute changes in the virtual sets.
15. The equipment should have in-built automation with dissolve transition between two video or image files.
16. The equipment should have in-built playlist generator for playing video clips in sequence with the Mark in and Mark out facility for video clips to do simple last minute editing.
17. The equipment should have in-built graphic overlay support with cut and fade transition and it should support 32 bit alpha image in TGA, BMP and PNG file formats.
18. The equipment should support one bi-directional scroll line overlay with variable speed.
19. The equipment should have built in software capability and Ethernet input to support display of VGA screen from client computer system or laptop.
20. The equipment should have in-built audio mixer for 2 live audio input channels and 2 video clips.
21. The equipment should have in-built virtual camera switcher with cuts and virtual motion capability like zoom in, zoom out, pan, tilt, and trolley and jib motions.
22. The equipment should support shadows and reflections of virtual set and live anchors in real time
23. The equipment should have built in motion designer software for creating and modifying virtual camera motion such as zoom, pan, tilt and dolly.
24. The equipment should have built in global camera software support for creating and modifying virtual camera angles and motions.
25. The equipment should have built in image compositing software for creating images for the use in image overlay facility in the virtual set.

26. The equipment should have mechanical and logical bypass facility. SDI input 1 should be routed to SDI output 1 in case of power failure.
27. The equipment should have built in audio delay facility to synchronize incoming audio and video inputs to processed video at synchronized output.
28. The equipment should have Shader materials supports like glass & metal to give realistic look to the virtual set.
29. The equipment should support 3D animated object in the virtual set and it should retain its original animation and should play continuously in loop irrespective of the virtual camera angles and motions.
30. The equipment should support all online updates.
31. The equipment should have redundant power supply.
32. The equipment should have built-in Genlock input and reference loop output for synchronizing video inputs.
33. The equipment should have GPI, RS 232 and RS 422 interface ports.
34. The equipment should have tally facility for all its inputs.
35. The equipment supplier should offer minimum 25 virtual sets free with the equipment.
36. The equipment should function with standard AC230 VOLT, 50Hz power supply. If the offered product function on DC supply than the firm should offer the necessary standard power adapter with required cables.
37. The equipment supplier should design, create and provide 1 custom virtual set free as per our requirement.
38. The equipment supplier should provide free training for operation of equipment at their expenses.
39. The equipment supplier should provide free training for creating virtual set at their expenses.
40. The equipment supplier should do installation and commissioning of supplied equipment free of charge at our studio.

## **HARDWARE SPECIFICATIONS:**

### **Computer System**

1. 4 RU rack mount cabinet with redundant power supply (minimum 700 watts)
2. Motherboard: Supermicro or Intel
3. Processor: Intel i7 or Intel Xeon
4. RAM: DDR III – 3 GB

5. Hard Disk Drive: 500 GB (2 nos.) or greater
6. Graphic display card: Radeon HD 7970 with 3 GB RAM or better
7. DVD writer
8. Computer keyboard
9. Optical mouse
10. 18.5" monitor or higher size
11. Operating System: Microsoft Windows 7 – 32 bit - Licensed version

### **Tactile Keyboard switcher**

1. Hardware tactile keyboard switcher connecting to the main equipment via USB port.

### **External breakout box with the following specification**

(For audio and video inputs and outputs with necessary cables to connect to the main system)

#### **Video Inputs:**

1. 5 x SD-SDI Inputs via BNC connectors or
2. 4 x HD-SDI Inputs via BNC connectors

#### **Video Outputs:**

1. 2 x SDI (SD or HD) via BNC connectors
2. 1 x CVBS for SD via BNC connector
3. All outputs should be simultaneously visible and available for further utilization.

#### **Audio Inputs:**

1. 1 x Analogue Balanced (XLR) stereo inputs

#### **Audio Output**

1. 1 x Analogue balanced (XLR) stereo output

#### **Genlock input and output**

1. Analog or digital reference in and loop out via BNC

#### **Tally**

1. 15 Pin Tally connector for all video inputs

#### **Deck Controls**

1. 9 Pin RS 232 connector for external VTR or digital disk player
2. 9 Pin RS 422 connector for external VTR or digital disk player

#### **GPI/O**

1. 25 Pin GPI/O connector General Purpose Inputs

#### **Mechanical By-pass**

1. Mechanical and logical bypass where SDI input 1 should be routed to SDI 1 output in case of power failure.

## **9. Specification for Teleprompter with PC**

### **1. Scope**

This specification describes the performance requirement of teleprompting device to be used in Studios/Media centers of CEC network for educational TV. The system need to be used as an aid to the news presenters/announcers/TV programme presenter without going through the strenuous rehearsal and memorizing any list and presenting them in a confident and elegant manner. In addition the presenter is able to handle he last minute changes I the script and cue at the appropriate point with the help of the system, the appropriate point with the help of the system, the equipment should consists of the following part.

### **2. General Requirement**

The base station will consists of latest Pentium Series of Computer with MS windows environment operating system. In addition to the standard software, there will be GIST based multilingual software, which enables prompting to be achieved in all major India Languages. Tenderers are required to quote for all major Indian language fonts such as Hindi, Gujrati, Tamil, Telegu, Kashmiri, Kannada, Punjabi, Manipuri, Bangali, Marathi and Malayalam etc. the prompt card/IMT card should directly be plugged into PC motherboard through ISA/PCU expansion slot. The card should provide the smooth scrolling output of the prompting text. This should have gunlock facility also. There should be four or more composite video output (PAL).

One camera prompting will be through a 15” LED or better based high resolution monitor. The monitor should provide, sharp high contrast and high brightness display for maximum legibility and clarity of text. The complete display device should be compact and light weight, with slide mounting plate for easy assembly on the camera. This should be mains DC operated. It should be possible to use it with all types of studio cameras fitted with box type lenses and as well as with ENG lenses. The offer should include all mounting accessories i.e. extended wedge plate, support rod, inclined mirror assembly etc.

The typical system for the teleprompter device shall be as under:-

- A. On camera prompter for the teleprompter device shall be as under:-
  - a. One Camera prompter display unit with mirror and supporting accessories – set to be decided.
- B. Computer with all the essential accessories such keyboard, mouse, monitor etc, and interface to a camera display unit. The computer will be loaded with MS Windows environment operating system for basic operations and software for prompting operations of multilingual text generation - 1 Set
- C. Suitable laser printer

### **3. Features of the Prompting Software and Base Unit**

- i. It should be possible to edit text anywhere in the script, without distributing the prompt output.
- ii. If changes are being made to the text, which is being shown to the presenter, these are to be reflected instantaneously in the output.
- iii. The size of the letters should be changeable and when required.
- iv. The system should run from 230 V AC.
- v. The run order of the items as pages should be interchangeable.

- vi. Edit access be possible instantly at any page or term.
- vii. There should be at least one composite video output with Genlock facility.
- viii. Speed control of the prompt output should be available from either desk hard central or foot control or both.
- ix. Facility for multiple speed control should also be available.
- x. Language change over should be instantaneous and within one or two operations.
- xi. It should be possible to take the hard copy of the script from the printer.
- xii. It should provide interfaces to News Rooms Automation System such as ENPS, iNews, AV Star, Autoque etc. It should also equipped with MOS interface/protocol.
- xiii. Facility to time he script and count the words.
- xiv. Overlaying of messages for the presenter such as current date and time, on screen up/down count etc.
- xv. Cordless Remote.

#### **4. Technical Specification**

4.1. TV Standards      CCIR PAL- B

4.2. Mains Supply      AC 230 Volts, 50 Hz

#### 4.3. On Camera Display Limit

- 1. Monitor Details      15” LED or better monitor of rugged robust and light weight having sharp and high resolution picture.
- 2. Power Supply      AC 230 volts, 50 Hz/DC 12 V 9 necessary adaptor to operate on mains should be offered.
- 3. Video input Signal      IV p-p  $\pm$  3 dB Composite video 75  $\Omega$  terminated.
- 4. Connector      75  $\Omega$  BNC for Composite input.
- 5. Brightness      15 pin D connector for VGA input 1300 c-e or higher.
- 6. Weight      7.5 Kg or less (weight including Wood & Glass).
- 7. Glass Transmission      80% or better.

#### 4.4. Preview Monitors:

This preferably will be of 9” picture tube having sharp and bright picture.

- 1. Video Signals      CCIR 625 lines, 50 Hz.
- 2. Horizontal Resolutions      Better than 250 TV lines at centre.
- 3. Video Input      Composite 1 V p-p with sync negative at 75  $\Omega$  loop through.
- 4. Power Requirement      230 V AC, 50 Hz.

#### 4.5. System Input/output

- a. Genlock input      1 V p-p 75  $\Omega$  VBS/BS.
- b. Video Output      4 outputs or more SDI/composite video (PAL) 1 v p-p, 75  $\Omega$  sync negative (If any VDA is required, should directly be

plugged into the PC motherboard through PCMCIA expansion slot)

- c. Video Connection            BNC Sockets.
  - d. Necessary connector interface upto 4 numbers, of speed control devices to control the speed searching of the prompter text.
  - e. Power                            230 V AC mains Supply, 50 Hz.
- 4.6. Host Computer (IBM compatible PC from thee reputed manufacturers having service backup throughout India).
- a. Processor (CPU)            Latest CPU as compatible with the system.
  - b. RAM                            2 GB RAM or higher with permission for expansion.
  - c. HDD                            Minimum 500 GB or higher.
  - d. DVD-R Drive
  - f. 105 keys keyboard standard for English, Hindi and other Indian languages mentioned above and matching mouse, Bilingual labels should also be provided.

The computer should have at least 2 Nos. of PCMCIA expansion slots.

## **10. Specifications for HD/SD SDI Video Monitor (Sizes: 14", 20" and 30")**

### **FEATURES AND SPECIFICATIONS**

#### **Calibration and stability:**

- Compliant with EBU, SMPTEC and ITU BT.709 primaries

#### **Processing:**

- 48 bit color processing (16 bit per color)
- 96-120 Hz native LCD driving (prevents motion judder, genlocks to all inputs)
- Genlock and frame sync
- Slow or fast sync selection

#### **Connectivity:**

- Modular input configuration: 4 slots
- Standard delivered with 1 SDI module
- Space for additional:
  - 1 x SDI module
  - 2 x DVI input modules

#### **SDI module:**

- Input/output card supporting 2x SDDSI or 2x HD-SDI
- 3Gb/s and Dual Link inputs

#### **Supported signal standards:**

- SD-SDI 576i/480i (ITU-R BT.601)
- HD-SDI 1080i at 60Hz field rate (SMPTE 274M)
- HD-SDI 720p at 50, 25 frame rate (SMPTE 296M)
- 3Gb/s and Dual Link HD-SDI (SMPTE 372M, 425M) are standard

#### **Functions:**

- Safe area and aspect ratio markers
- Extended aspect ratio and scaling factor selection
- Split-screen mode with zooming and panning per displayed input (for multiple camera color correction)
- In-Monitor-Display (IMD) and 2 in monitor tally lights controlled remotely (TSL v.3.1 and 4.0)

#### **Control:**

- Ethernet interface with web server and TCP/IP interface

## 11) 42-inch HD Professional LCD/O-LED Monitor

|  |   |
|--|---|
| Type   | A-Si TFT Active Matrix LCD  |
| Resolution                                       | 1920 x 1080 pixels (Full HD)  |
| Picture Size (H x W) (Viewable area)/ (Diagonal) | Approx. 930 x 523 mm (Approx. 36 5/8 x 20 5/8 inches) Viewable area (Diagonal) Approx. 1067 mm (Approx. 42 inches)  |
| Aspect   | 16:09   |
| Colours  | Approx 16,770,000 colours (8bits)   |
| Viewing Angle                                    | 88°/88°/88°/88° (typical) (up/down/left/right contrast>10:1)  |
| <b><u>Inputs</u></b>                             |   |
| Composite  | BNC x 1, 1.0 Vp-p ±3dB sync negative  |
| Y/C  | 4pin Mini DIN x 1 Y: 1.0 Vp-p ± 3dB sync negative<br>C: 0.286 Vp-p ± 3dB (NTSC burst signal level), 0.3 Vp-p ± 3dB (PAL burst signal level)   |
| RGB, Component                                   | BNC x 3 RGB : 0.7 Vp-p ± 3dB (Sync On Green, 0.3 Vp-p sync negative) Component : 0.7 Vp-p ± 3dB (75% chrominance standard colour bar signal)  |
| External Sync                                    | BNC x 1 0.3 to 4.0 Vp-p ± bipolarity ternary or negative polarity binary  |
| Audio  | RCA phono pin x 2 (L, R) -5 dBu 47 k ohms or higher   |
| HD15   | R/G/B: 0.7 Vp-p sync positive (Sync On Green, 0.3 Vp-p sync negative) Sync : Totallevel (polarity free, H/V separate and composite sync) Plug & Play function : corresponds to DDC-2B |
| DVI-D  | TMDS signal link w/HDCP   |
| Parallel Remote                                  | Modular connector 8 pin x 1 (pin assignment at users' allocation)   |
| Serial Remote (LAN)                              | D-sub 9-pin (RS232C) x 1, RJ-45 modular connector (ETHERNET) x 1 (10BASE-T/100BASE-TX)  |
| HD-SDI, SDI                                      | HD-SDI, SDI Inputs  |
| <b><u>Outputs</u></b>                            |   |
| Composite  | BNC x 1, Loop-though, with 75 ohms automatic termination  |
| Y/C  | 4pin mini DIN x 1 Loop-though, with 75 ohms automatic termination   |
| RGB, Component                                   | BNC x 3, Loop-though, with 75 ohms automatic termination  |
| External Sync                                    | BNC x 1, Loop-though, with 75 O automatic termination   |
| Audio monitor out                                | RCA phono pin type x 2 (L, R)   |
| Speaker (Built-in)                               | 1.0 W + 1.0 W (stereo)  |
| Monitor output                                   | Dependent on Option input slot type   |
| <b><u>General</u></b>                            |   |
| Power Requirement                                | AC100V to 240V 50/60Hz 2.3A to 1.1A   |
| Power Consumption                                | Maximum Approx. 230 W (with 2 x BKM-229X)   |
| Operating Temperature                            | 0 to 35 °C (recommended operation temperature 20 to 30°C)   |
| Operating Humidity                               | 30 to 85% (No condensation)   |



|                                      |   |
|--------------------------------------|---|
| Storage & Transport Temperature      | -20 to 60°C   |
| Storage & Transport Humidity         | 0 to 90 %   |
| Operating/Storage/Transport Pressure | 700 to 1060 hPa   |
| Dimensions (W x H x D)               | 1027 x 616 x 130 mm (40 1/2 x 24 3/8 x 5 1/8 inch)  |
| Mass                                 | With two option boards: Approx. 25 kg (55 lb 2 oz)<br>with BKM-229X x 2 Without option boards: Approx.<br>24.5 kg (54 lb) |
| Supplied Accessories                 | CDROM AC cord, AC plug holder Operating<br>instructions, Using the CD-ROM manual  |

## 12. Specifications for Ampli Speaker (100 W)

### TECHNICAL SPECIFICATIONS

#### Input format

Analog

#### SPL

Maximum short time sine wave acoustic output at 1 m on axis in half space, averaged from 100 Hz to 3 kHz

≥110 dB SPL

Maximum peak acoustic output per pair with music material

≥115 dB SPL @ 1m

#### Drivers

Bass

8"

Treble

1" metal dome

#### Crossover frequencies

1.8 kHz

#### Free field frequency response

38 Hz - 20 kHz (± 2 dB)

#### Amplifier power /ch

Bass

150 W

Midrange

-

Treble

120 W

#### Speaker dimensions (H x W x D)

mm

433 x 286 x 278 mm (Height with Iso-Pod™ 452 mm)

inches

17 1/16 x 11 1/4 x 10 15/16"  
(Height with Iso-Pod™ 17 13/16")

#### Amplifier dimensions\* (H x W x D)

mm

Integrated in the speaker cabinet

## 13. MPEG 4 Encoder Decoder

### ENCODER

The encoder should support either SD/HD video formats in a key-enabled architecture. Video input should be SDI or HD-SDI. It should provide a reduced-resolution compressed stream output. It should support up to three stereo pairs of audio.

The basic specifications are as follows: -

## **Video**

### **HD-SDI High-Definition:**

| <b>Digital Video Input Formats</b> | <b>Sample x Lines @ Rate</b> | <b>Standard</b>                   |
|------------------------------------|------------------------------|-----------------------------------|
| 1080i 30                           | 1920x1080 @ 30/1.001 Hz      | SMPTE 292M-1998, Table 1 Column E |
| 1080i 25                           | 1920x1080 @ 25 Hz            | SMPTE 292M-1998, Table 1 Column F |
| 720p 60                            | 1280x720 @ 60/1.001 Hz       | SMPTE 292M-1998, Table 1 Column M |
| Input Line Rate(s)                 | 1.485 Gb/s and 1.485/1.001   |                                   |

### **SDI Standard-Definition Digital Video Input Formats**

|                              |                          |
|------------------------------|--------------------------|
| 480 and 525-Line Resolutions | 720x480, 720x525         |
| Formats                      | ANSI / SMPTE 259M-C 1997 |
| Input Line Rate              | 270 Mb/s                 |

### **Physical Interface**

|                  |                                  |
|------------------|----------------------------------|
| Jitter Tolerance | Meets SMPTE RP184 specifications |
| Sampling         | 8-bit                            |
| Connectors       | 75 ohm BNC                       |

### **Video Compression**

|   |   |
|---|---|
| Standard                                  | MPEG-4 Part 10 / H.264 / ISO/IEC 14496-10 2003  |
| Profile and Level                         | Supports main profile at Level 4.0-compatible decoders                                |
| HD Horizontal Resolutions                 | 1080i: 1920, 1440, 1280,<br>960 720p: 1280, 960, 640                                  |
| SD Horizontal Resolutions                 | 480i: 720, 704, 640, 544,<br>528, 480, 352 576i: 720,<br>704, 640, 544, 528, 480, 352 |
| Anchor Frames                             | 2   |
| Macro Block Processing                    | In-loop de-blocking   |
| Coding                                    | CABAC   |
| Compressed Output (to backplane) Bitrates | 0 25-20.0 Mb/s  |
| PIP Resolutions                           | 96 x 96 and 192 x 192 pixels  |

| <b>VBI Input Formats</b>    | <b>VBI Standard</b> | <b>MPEG Carriage Standard</b>         |
|-----------------------------|---------------------|---------------------------------------|
| Closed Captions             | EIA-608             | EIA-708 and ETSI EN 301 775           |
| Vertical Interval Time Code | SMPTE 12M           | SMPTE 266M ISO/IEC 13818-(GOP Header) |
| WST Teletext                | ETSI EN 300 706     | ETSI EN 301 775 and ETSI EN 300 472   |
| Wide Screen Signaling       | ETSI EN 300 294     | ETSI EN 301 775                       |

|   |   |                 |
|---|---|-----------------|
| Lossless Luma (six lines max )                        | —   | ETSI EN 301 775 |
| Prestored Test Patterns                               | Various   | Proprietary     |
| <b>Audio Specifications</b>                           |   |                 |
| Digital Audio Input                                   |   |                 |
| Format  | AES (AES3-1992, ANSI S4.40-1992), SMPTE 276M                            |                 |
| Sampling  | Synchronized to video and re-sampled to 48 kHz at 24 bits               |                 |
| Connectors  | 75 ohm BNC  |                 |
| <b>Audio Compression and SMPTE 302 Audio Handling</b> |   |                 |
| Audio Compression Standards                           |   |                 |
| Surround Sound  | AAC-LC 5.1, HE-AAC 5.1  |                 |
| 3-Channel (3 stereo pairs)                            | Dolby® AC-3 2.0, MPEG-1 Layer 2, SMPTE 302M, AAC-LC 2.0, and HE-AAC 2.0 |                 |
| Compressed Audio Bitrates                             | 32-640 kb/s, and 2.8, 2.4, 2.0 Mb/s (standard-dependent)                |                 |

## GENERAL SPECIFICATIONS

### Systems Multiplex

|                                       |   |
|---------------------------------------|---|
| Ad insertion / Splice point signaling | SCTE 104/SCTE 35                                  |
| Format                                | MPEG-2 transport stream                           |
| PSI formats                           | ISO (IEC 13818.1 MPEG-2 systems)                  |
| Encryption                            | BISS-1, BISS-E (EBU Tech 3292 rev. 2)             |
| Jitter                                | < 1 ms of multiplex jitter<br>< 500 ns PCR jitter |

## DECODER

It should have DVB-S/S2 demodulation capabilities and inputs for DVB-ASI and IP as standard feature. It should support MPEG-2 and H.264 video compression; from the 4:2:2 format to SD and HD formats; as well as MPEG, Dolby® Digital AAC and SMPTE-302 audio systems. It should support vertical ancillary data space (VANC) transport, wide-screen signalling (WSS), active format description (AFD) and other related data signals, as well as DVB fixed-key decryption (BISS) and DVB Common Interface (DVB-CI) descrambling methods.

## FEATURES

- Bitstream Input/Output Capabilities
  - DVB-S, DVB-S2 satellite demodulator (standard)
  - Advanced RF demodulator (option) for 16/32 QAM and DSNG
  - DVB-ASI input and output (standard)
  - Dual IP SMPTE 2022-1 inputs and outputs (standard)
  - DVB fixed-key (BISS) decryption (standard)
  - DVB common interface module slot (option)
  - Smart PID filtering to output selected streams on ASI or IP
- Video Compression Formats
  - MPEG-2 MP@ML, MP@HL (standard)
  - MPEG-2 422P@ML, 422P@HL (option)
  - H.264 MP@L3, MP@L4.1 (standard)
  - H.264 422P@L3, 422P@L4.1 [8-bit] (option)
- Audio Compression Formats

- AAC-LC, HE-AAC v2 2.0 and 5.1 decode (standard)
- MPEG-1 Layer II decode (standard)
- Dolby® Digital (AC-3) 2.0 and 5.1 decode (standard)
- SMPTE-302 PCM and Dolby® E pass-through with AVTrack™ (standard)
- One or two Dolby® E integrated decoders (option)
- Data/Ancillary Capabilities (standard)
  - VANC processing
  - AFD and WSS
  - Teletext
  - VBI
- Video/Audio Output Capabilities
  - Dual SDI/HDSDI video outputs 1080i/720p/625i,50
  - Eight stereo pairs of assignable embedded audio
  - Four assignable separate AES outputs

### Receiver

|                           |  |
|---------------------------|--|
| Connectors                | F-Type (up to 4)   |
| Input Impedance           | 75 ohms  |
| Baud Rate Range           | 2 to 45 Mbaud (DVB-S/DSNG), 10 to 30 Mbaud (DVB-S2)  |
| Modulation                | QPSK (DVB-S), QPSK/8 PSK/16 APSK (DVB-S2)<br>QOSK/8 PSK (DVB-DSNG/S)   |
| Inner Code:               |  |
| DVB-S                     | QPSK 1/2, 2/3, 3/4, 5/6, 6/7, 7/8<br>8 PSK 2/3, 5/6, 8/9<br>16 QAM 3/4, 7/8  |
| DVB-S2                    | QPSK 1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 5/6, 8/9, 9/10<br>8 PSK 3/5, 2/3, 3/4, 5/6, 8/9, 9/10<br>16 APSK 2/3, 3/4, 4/5, 5/6, 8/9, 9/10<br>32 APSK 3/4, 4/5, 5/6, 8/9, 9/10 |
| DVB-DSNG                  | QPSK 1/2, 2/3, 3/4, 5/6, 6/7, 7/8<br>8 PSK 2/3, 5/6, 8/9<br>16 QAM 3/4, 7/8  |
| Outer Code                | 204, 188 Reed-Solomon per EN 300 421   |
| L-Band Frequency Range    | 0.9400 to 1.7500 GHz (In 0.0005 GHz steps)   |
| Maximum Total Input Power | -25 dBm  |
| Minimum Signal Level      | -55 dBm  |

### Video Output: Serial Digital Interface

|           |                                 |
|-----------|---------------------------------|
| Standard  | HD-SDI and SDI (SMPTE 292M/259) |
| Connector | BNC (2)                         |
| Formats   | 1080i/50, 720p/50               |

### MPEG-2 and H.264 Video Decoding

|                 |  |
|-----------------|--|
| MPEG-2 Profiles | Main profile at main level (NTSC/PAL)<br>Main profile at high level (HD)<br>4:2:2 profile at main level (SD)<br>4:2:2 profile at high level (HD) |
| H.264 Profiles  | Main profile at level 3.1<br>High profile at level 4.2 (Broadcast HD)<br>4:2:2 profile at level 4.2 (8-bit only)                                 |

Maximum Video                    108 Mb/s  
Elementary Stream Bitrate

### **Audio**

Bitstream Decoding                Dolby® Digital AC-3 2.0  
Formats Supported                Dolby® Digital AC-3 5.1  
    MPEG-1 layer 2  
    SMPTE 302M (Dolby® E compatible), IEC 958  
    Dolby® E integrated decode (optional)  
    Advanced audio coding low complexity (AAC-LC) 2.0 and 5.1  
    High-efficiency AAC version 1 (2.0) and version 2 (HE-AAC v2  
    2.0)  
    HE-AAC 5.1

Digital Audio Output                AES/EBU as per SMPTE 276  
Format                                Embedded as per SMPTE 299  
    Pass through encoding audio (SMPTE 337) with no restrictions

### **Reference Input**

Type                                    Blackburst composite video  
Reference Connector                BNC with passive loop through  
Standard                                SMPTE RP 154

### **Control LAN Interfaces**

Type                                    10/100Base-T Ethernet (IEEE 802.1)  
Connector                              RJ45

### **Transport Stream Interface**

Connector                              2 BNCs (1 in/1 out) and 2 RJ45 (bi-directional)  
Physical Layer Interface            DVB-ASI (auto-sensing)  
DVB-ASI Transport                 0.0 to 214.0 Mb/s  
Stream Data Rate  
IP Transport Stream Data            0.0 to 120.0 Mb/s  
Rate  
IP over Ethernet                    10/100/1000Base-T Ethernet (IEEE 802.1)  
FEC                                      SMPTE 2022

## **14. Specifications for Digital/ Analogue HD/SD Waveform Monitor**

### **1. SCOPE:**

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

### **2. ESSENTIAL FEATURES:**

2.1 The firm should offer a high precision, single unit color LCD based broadcasting HD and SD waveform monitor having digital signal processing capable of highly accurate measurement.

- 2.2 The waveform monitor should have two selectable inputs to receive two numbers of High Definition and Standard Definition serial digital signals. The formats of the digital signal should comply with SMPTE 292M and SMPTE 259M standards.
- 2.3 The offered product should be able to provide real time LCD display suitable for Live monitoring.
- 2.4 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>.
- 2.5 The Waveform Monitor should be able to monitor Gamut in RGB and YP<sub>b</sub>P<sub>r</sub>.
- 2.6 The waveform monitor offered should have the picture display function of the video signal on the LCD.
- 2.7 The Waveform Monitor should be capable to display four measurements at a time, in any combination such as waveform display, vector display, picture display and status display.
- 2.8 The Waveform Monitor should offer remote access and control with a standard Web-browser.
- 2.9 The offered waveform monitor should facilitate Eye pattern view of the incoming selected digital video signal with Timing cursors with necessary filters.
- 2.10 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.
- 2.11 It should be possible to measure the level of the serial digital signal and displayed as equivalent length of coaxial cable.
- 2.12 The offered product should have the feature of Vector/Lightening display of the color difference signals. The vector should display user-selectable graticules, color targets (75% and 100%) and color axis.
- 2.13 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.
- 2.14 The Waveform Monitor should be able to do trigger capturing that automatically acquires data on the occurrence of specific faults.
- 2.15 The Waveform Monitor should have safe area graticules on the picture display to quickly verify correct placement of graphics, Titles or logos.
- 2.16 The Waveform Monitor should be able to store at least 30 presets.
- 2.17 The Waveform Monitor should have USB Connector at the front to store the presets.
- 2.18 It should have 10/100 Base-T Ethernet connection and offer remote access.
- 2.19 It should have SNMP interface to allow easy integration with network management software.
- 2.20 All accessories like 19" rack mount kit, cabinet etc, should be quoted separately in this offer.
- 2.21 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.

### 3. TECHNICAL SPECIFICATIONS:

- 3.1 **HD Input:**
  - 3.1.1 Input 2, SMPTE 292M
  - 3.1.2 Input Type 75 Ω BNC
  - 3.1.3 Input level 800 mVp-p ± 10%
  - 3.1.4 Return Loss > 15 dB from 1 MHz to 270 MHz
  - 3.1.5 Receiver Equalization Range Up to 100m of type 8281 cable.
  - 3.1.6 Waveform Vertical Characteristics
    - 3.1.6.1 Frequency Response: Luminance Channel (Y): ± 0.5 %, 50 KHz to 30 MHz , Chrominance Channel: ± 0.5 %, 50 KHz to 15 MHz.
    - 3.1.6.2 Vertical Measurement Accuracy at 1X: ± 0.5%; at 5X: ± 0.2% of 700 mV full scale mode.

### 3.1.6.3 Gain X1, X5 and X10

## 3.2 SD Input:

3.2.1 Input 2, SMPTE 259M, 625/50

3.2.2 Input Type 75  $\Omega$  BNC

3.2.3 Input level 800 mVp-p  $\pm$  10%

3.2.4 Return Loss > 15 dB from 1 MHz to 270 MHz

3.2.5 Receiver Equalization Range Up to 250m of type 8281 cable.

3.2.6 Waveform Vertical Characteristics

3.2.6.1 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.

3.2.6.2 Vertical Measurement Accuracy At 1X:  $\pm$  0.5%; at 5X:  $\pm$  0.2% of 700 mV full scale mode.

3.2.6.3 Gain X1, X5 and X10

## 3.3 Serial Digital Output

3.3.1 Signal format 1.485 Gbps for HD and 270 Mbps for SD.

3.3.2 Output level 800 mVp-p  $\pm$  10% across 75  $\Omega$  load.

3.3.3 Return loss 15 dB, 1 – 1.5 GHz

## 3.4 Eye Pattern Display (For Eye Pattern configuration)

3.4.1 Type Equivalent Time sampler.

3.4.2 Bandwidth Supported format SMPTE 292M, 1.485 Gbps and SMPTE 259M, 270 Mbps

3.4.3 Jitter Filter: 10 Hz, 1 KHz, 10KHz & 100KHz

3.4.4 Amplitude Accuracy 800 mV  $\pm$  5% for 800 mV input

## 3.5 Component Vector Mode

3.5.1 Vertical Bandwidth 3.4 MHz for HD and 800 KHz for SD

3.5.2 Vertical Gain Accuracy  $\pm$  0.5%

3.5.3 Horizontal Gain Accuracy  $\pm$  0.5%

3.5.4 Vector Display  $P_B$  is displayed on Horizontal axis and  $P_R$  is displayed on Vertical axis

## 3.6 External Reference

3.6.1 Synchronization Both, Internal and external synchronization facility

3.6.2 Input Type Black burst, Tri-level Sync, BNC, 75  $\Omega$

3.6.3 DC Input Impedance 15 k $\Omega$

3.6.4 Return Loss  $\geq$  30 dB

## 3.7 Display

3.7.1 Screen Type: Color LCD

3.7.2 Resolution: 1024 X 768

3.7.3 Size: 6.3"

3.7.4 Format: XGA

3.7.5 Screen: 1 – screen and 4 – screen display

## 3.8 Power supply & operating temperature

3.8.1 Input 230  $\pm$  10% VAC, 50 Hz

3.8.2 Operating Temperature 0 $^{\circ}$  to 40 $^{\circ}$ C

## 4. 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 included for completeness of the system.

#### 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 CEC Specs. | CEC 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 CEC specs. | Features in the Sys. Offered Which exceed CEC 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 CEC, 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/repared 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.

## 15. 125 KV Genset (silent)

**EMRC, MADURAI KAMARAJ UNIVERSITY  
PALKALAI NAGAR  
MADURAI-21  
TENDER CONDITIONS AND INSTRUCTIONS TO TENDERS  
FOR 1 NO OF 125 KVA / 433 V  
DGSET(WITHSUITABLEACOUSTIC ENCLOSURE , AMF  
PANEL)SUPPLY AND INSTALLATION AND  
COMMISSIONING**

### 1. Qualification Criteria.

The tenderer should be a Generator Manufacturer or an Authorised Dealer with experience in similar type of work for the past 2 years in Government departments. The tenderer should produce copies of certificates or documentary evidences duly attested by Notary public or Gazetted officer in support of Manufacture or an Authorised Dealer and experience.

### 2. Earnest money Deposit.

The tenderer should furnish a sum of Rs.9200/-(Rupees Six thousand only) and GST 18%(CGST-9% AND SGST – 9%) for that amount towards EMD. The EMD amount should be remitted through online in Madurai Kamaraj University Account No:4 (GST should be remitted separately –for 33AAAJMO776B1ZL. The tender will be rejected summarily if EMD other than the above form is furnished. Also, the tender without EMD will be summarily rejected.

3. Copies of latest Sales Tax Registration certificate with TIN No latest Sales Tax verification certificate and latest Income Tax return form filed with PAN No. duly attested by Notary Public (or) Gazetted Officer should be enclosed along with the tender.

### 4. Security Deposit.

The successful tenderer should furnish a security Deposit at 2% of the contract value including EMD.

### 5. Validity.

The tender should be valid for 90 days from the date of opening of tender.

### 6. Additional Security Deposit:

On evaluation of tender if it is found that if the overall quoted amount of the tender is less than 5 to 15% of the value put to tender, the contractor should pay an additional Security at 2% of the quoted value. If the tender discount exceeds 15% to 20%, the contractor should pay an additional security deposit at 50% of the difference between the quoted amount and estimated amount. Failure to furnish the additional Security Deposit within 15 days from the date of receipt of acceptance order and execute the contract ( Sign the agreement) shall entitle cancellation of award of contract and forfeiture of EMD furnished.

### 7. TERMS OF PAYMENT:

The payment will be made as follows.

a). 85% of the value of the equipments will be paid on receipt of at equipments site in good condition.

b). Balance amount after retaining 5% value of contractor will be made on completion of work (i.e) erection commissioning, testing and handing over of the Generator set in satisfactory working condition to the user Department by the firm.

c). The withheld amount of 5% of the contract value will be recovered in each and every part to bill of payment. The withheld amount of 5% along with Security Deposit at 2% of the contract value will be released after two years on successful expiry of the Guarantee period, after ascertaining satisfactory performance of the generator set in the form of Government Cheque as per the rules prevailing at that time.

d). Sales Taxes on works contract and Income Tax will be deducted in each and every bill if required, as per rules in force.

## 8.GUARANTEE

The Generator set should be guaranteed at least for a period of **Two years** from the date of handing over of the Generator set against any manufacturing defect or bad workmanship. Free servicing should be provided every month and break down calls should be attended at free of cost during guarantee period. If at any time during the Guarantee period, the generator set is out of order for more than 2 months at a time, then the guarantee period will be extended by the period from the date of Generator set went out of order to the date when it was recommissioned. The Guarantee will commence only from the date of handing over the Generator set to the user Department.

9. The tenderers are requested to go through the Tender Schedule, Tender conditions and instructions carefully and then Quote. Tender for a portion of work will not be considered and tender must be in full conformity with these specifications with out any deviation. If the tenderers wish they may submit any number of alternative offer with complete details.

10. The tenders are advised to inspect the site at their owncost before offering their tenders. The requirement of concrete bed for the installation of Diesel Generator set should be provided by the tenderer. Any piecemeal requirement will not be entertained during the execution of the work.

11. The tender schedule with the tender conditions to tenderer (which are purchased) should be duly filled in, signed and should be returned along with details. The rates in the tender should be written in words also. Corrections if any should be attested with dated initials.

12. The tender should be given in sealed cover subscribing the Name of work and the tender due date. Unsealed cover will not be opened and will not be considered.

13.If the last date fixed for opening of tender is suddenly declared as Government holyday the opening date is deemed to be extended upto the following working day.

14. Conditional tender will be summarily rejected any tender clarification affecting the price structure, after tender opening will not be considered.

15. The engine shall conform to BSS 5414/ IS 10000

16. Wherever the specifications not mentioned the materials specifications,

factor of safety etc. of the components of the Generator set should confirm to IS specifications.

17. The leaflet, literature and catalogues of the Generator set should be submitted along with the offer.

18. The tenderer should quote the rates clearly for all the items of supply, Labour etc. including the cost of unambiguous terms.

19. Price variation clause will not be Accepted. The price offered should be firm through out the contract period.

20. The rates offered should be inclusive of DG set, sound proof enclosure, AMF panel, packing, GST, Forwarding transit, insurance charges.

21. Unit rates should be furnished for measurable item like for earthing copper exhaust piping, cabling giving connection etc. The actual quantity used will be measured at the time of execution and the corresponding amount will be paid.

22. The department reserves the right to reject any or every tender received without assigning any reason.

23. The tenderer should not refer to the court of law for any dispute and the decision of department is final and binding.

24. Completion of work:

The accepted tenderer should complete the work of supply, erection, testing and handing over in conformity with tender schedule and general specification within the stipulated time from the date of receipt of order to proceed with the work or from the date of handing over the site.

25. The actual time required for supply, Installation, testing and handing over by the tenderer.

26. Necessary license if any required should be got and arranged for by the tenderer and the department will not take up any responsibility or recommendations for the permit etc.

27. The work should be carried out in cooperation with the occupying department.

28. Necessary drawings for the general arrangements of the Generator set and circuit diagram for the standard control panel should be prepared and got approved from the Chief Electrical inspector to Government authorities by the successful tenderer. The necessary CEIG inspection charges should also be borne by the tenderer.

29. The shortest delivery period and stock position should be Priorly stated. Delivery from ready stock will be preferred.

30. The goods should be insured at the cost of suppliers, Any loss or damage while in transit should be borne by the supplier.

31. The supplier should produce gate pass in original for the materials, supplied before making payment if necessary.

32. set of electrical wiring diagram, 3 set of operation manual and 3 set of foundational drawings for the generator set should be submitted at the time of supply of materials.

33. Period of completion:

The entire supply, erection commissioning, testing and handing over 1 No. of 125 KVA / 433V / 50hz Generator set should be completed in 30 days as detailed below.

a. Supply: The Generator set should be supplied at the site within 30 days from the date of order date of conclusion of agreement/ date of approval of drawing whichever is later.

b. The Generator set should be permanently erected, commissioned, and tested within 20 Days from the date of supply of Generator sets from the date of readiness of Generator rooms from the date availability of electrical supply whichever is later.

34. Tender for a portion of work will not be considered and tender must be in full conformity with these specifications without any deviation. Erection and commissioning means including of earthing work, cable laying, panel board erection, erection of the Diesel Generator Set on the concrete bed, load test, Temperature check etc.

Supply of tools and spares.

a. One set of complete tool box should be provided by the tenderer.

b. One set of spares for the engine accessories should be provided.

35. Director, EMRC Madurai Kamaraj University, Madurai -21 will be arbitrator for any dispute arising out of this contract.

36. Extension of time will not be permitted and the entire work should be completed in all respects within the stipulated period from the date of receipt of order or from the date of handing over of the site.

37. The tender may be accepted as a whole or for any part and the quantities may at the discretion of the Director, EMRC be increased, decreased or omitted during execution.

38. The contractor should be present at the premises at the time of connecting the installation to the supply mains and should afford all facilities and testing and connecting up and commissioning.

39. All tests on site should be conducted by the supplier in the presence of Assistant Executive Engineer /Electrical and a report on the test conducted should be signed by the contractor and the Assistant Executive Engineer, MKU and submitted to the Director, EMRC for approval before acceptance.

40.a) At least two of Electrical technicians should be provided well – versed training in the area of operation and servicing at the factory.

b) The contractor is responsible for free servicing of DG set for the first one year period.

41. The contractor engaging the labours for the work is wholly responsible for any accident or death occurring to the laborers while carrying out the work and the department shall not be responsible for the such occurrence and for the payment of compensation to the labours.

42. Tender received in time will alone be considered Telegraphic offer will not be considered.

43. Department will not take any responsibility for the delay/loss in transmit of the tender send by the post.

44. No representation or appeal of any kind will be allowed for belated receipt of tenders by post beyond the notified date or loss the transit etc.

45. The supplier should enclose the evidence about GST no :

46. TAX : GENERAL CONDITION OF CONTRACT.

The contractor shall be solely responsible for the payment of GST and other taxes as per the govt norms in addition to Tendered Rates due to any plea of subsequent levy increase in tax will be entertained vide also clause 32 (2) of general conditions to contract.

47. The extension of time required to complete the work should be obtained by indicating the reasons for the delay and any period not covered by extension of time will be treated as unauthenticated calling for penal action.

48. Proper evidence should be produced by the firm to satisfaction of the Registrar whenever force measure condition arise.

49. The tenderers who are expecting the Departmental Terms and conditions on EMD, security deposits, payment Guarantee, Free servicing, completion period, Arbitration clause, Penalty clause etc., above should quote for the tender call. The offer of the tendered who stipulate their own terms and conditions will summarily be rejected and such tenderers will be banned from quoting by not insuring the department tender schedule in future tender calls of department.

Signature of the  
contractor

Registrar

Madurai Kamaraj University



## **PROFORMA –I**

- 1. Is the offer in conformity with the departmental specifications.  
(If not specify deviation details of components.)** **Yes or No**
- 2 Make model No.**
- 3. Time required to deliver the equipment from the date of order (Note : the Generator set should be supplied with in 30 days from the date of tender)** **Days.**
- 4. Time required for erection, testing, commissioning and handing over (note the erection, testing, commissioning should be completed with in 20 days from the date of supply of Generator set)** **Days.**
- 5. Is the tenderer applicable agreeable to furnish 2% security deposit against tenderer value** **Yes /No.**
- 6. Is the price quoted is firm till the completion of the final testing** **Yes /No.**
- 7. Whether the material will be delivered at the site at free of cost** **Yes /No.**
- 8. Is the offer valid for 90 days.** **Yes/No.**
- 9. Where the guarantee period offered is as per department requirement** **Yes /No.**
- 10. Is the tenderer agreeable for the departmental penalty clause.** **Yes /No.**
- 11. Is the tenderer agreeable for the training of the departmental personal** **Yes /No.**
- 12. Is the latest income tax verification certificate enclosed** **Yes /No.**



- |     |  |        |
|-----|--|--------|
| 13. | Is the previous experience certificate in this type of work enclosed                             | Yes/No |
| 14  | Is the price quoted is inclusive of all taxes and duties till the completion of the entire works | Yes/No |
| 15. | Is the foundation drawings for the creation of generator set enclosed                            | Yes/No |
| 16. | Is the tenderer furnished EMD as required by the department                                      | Yes/No |

Tenderer

## PROFORMA 11

### TECHNICAL DETAILS OF GENERATOR SET

| Sl . No | Generator set            | Make |
|---------|--------------------------|------|
| 1.      | <u>Diesel Engine</u>     |      |
|         | a. Capacity in BHP       |      |
|         | b.Make                   |      |
|         | c.Model                  |      |
|         | d. Rated output in BHP   |      |
|         | e. RPM                   |      |
|         | f. Engine cooling system |      |
|         | g. No.of. cylinder       |      |

- h. No.of strokes**
- i. Fuel tank capacity in Lit**
- j. Fuel consumption in lit on full load**
- k. Method of starting**
- l. Exhaust type**
- m. Safety control**

## **II Size of generator set**

- a.Length**
- b.Breadth**
- c.Height**
- d. Total weight**

## **III Alternator**

- a. Capacity in KVA /KW**
- b. Power factor**
- c. Phase(single/three)**
- d. Volts**
- e. Frequency**
- f. Full load current in amps.**
- g. No load speed in RPM**
- h. Full load speed in RPM**
- i. No load current**
- j. Type of battery**

**Make:**

**Model:**

**AH :**

**k. Class of insulation**

**IV Base Frame :**

**V Acoustic Enclosure :**

**VI Concrete bed for erection of generator:**

**VII Standard Control Panel**

- a) Voltmeter with selector switch :**
- b) Ammeter (Digital / Analog range) :**
- c) Frequency meter (Digital/ Analog resolution ) :**
- d) Indicating Lamp :**
- e) KWH meter:**
- f) KW meter :**
- g) ACB :**
- h) Earth fault relay  
(Minimum current required to operate) :**
- i ) Over load relay :**

**Tenderer**

**F.O.R :**

**DELIVERY :**

**PAYMENT :**

**INSURANCE :**

**WARRANTY :**

**OTHER CONDITION :**

**SIGNATURE OF Tenderer**

**PRICE SCHEDULE**

**MAKE :**

**PRICE :**

**E.M.D :**

**EDUCATION CESS :**

**GST :**

**TOTAL PRICE :**

**SIGNATURE OF  
MANUFACTURER**

**MADURAI KAMARAJ UNIVERSITY**  
*(University with Potential for Excellence)*

**GENERAL INSTRUCTIONS, TERMS AND CONDITIONS**

**FOR SUPPLY OF SCIENTIFIC EQUIPMENT**  
**HIGH RESOLUTION TRANSMISSION ELECTRON MICROSCOPE (HR TEM)**

1. The tender schedule is not transferable and it should be used only by the tenderer to whom it is officially issued.
1. The tender documents can be downloaded from the University web site [1. www.mkuniversity.org](http://www.mkuniversity.org) [2. www.tenders.tn.gov.in](http://www.tenders.tn.gov.in) the document cost i.e. Rs.2,950/- (Rs.2500+Rs.450/- GST) must be made by the tenderer by way of crossed Demand Draft drawn in favour of The Registrar, Madurai Kamaraj University, Madurai 21 payable at Madurai along with tender submission document.
3. The tenderer has the option of sending the offer by Registered post or by Speed post or by courier so as to reach by the date and time indicated. **The last date for receipt of filled in tender document is 23.10.2017 at 10.30 a.m. and the Opening of the technical bid is 23.10.2017 at 4.00 p.m.** This University will not be responsible for any postal or other transit delay in receipt of the tender offer.
4. **A single stage, two-envelope (Technical Bid and Commercial Bid envelopes) bidding procedure will be followed.**
5. In addition to the hard copy of Technical Bid, soft copy shall also be submitted in a Compact Disc.
6. All Bids must be delivered at the office of Registrar, Madurai Kamaraj University not later than 10:30 a.m. on **23.10.2017** Technical Bids will be opened at 4.00 p.m. on 23.10.2017 in the presence of the Bidders' representatives who choose to attend. Names of Bidders together with the Nationality of manufacturers and suppliers and such other details as Madurai Kamaraj University, at its discretion, may consider appropriate, will be read out. Price Bids of those who qualify in Technical Bids will be opened at a later date, which will be informed to the qualified Bidders.
7. All the envelopes shall bear on the top left corner, Madurai Kamaraj University's Bid Document Number and also Bid Due Date, and on the bottom left corner, Bidder's name and address.
8. Telex /Fax or Telegraphic offers will not be entertained and will be rejected.
9. Only the tender document downloaded from the University website should be used and it should be resubmitted in full shape without detaching any page from it.

Tenders in any forms other than the forms and schedules issued by the University to the tenderer will not be considered and will be rejected as non-responsive.

10. Each page of the tender document, including technical specifications, should be duly signed for having noted the contents of the document
11. Tenders will be liable to rejection
  - a. If the country of manufacture and of the origin of material used in manufacture of articles is not noted in the tender.
  - b. If the tender is not in the form supplied by this Office or downloaded from the departmental website.
  - c. If the cost of the tender document is not accompanied if the same is down loaded from the web site.
  - d. If the tender is not accompanied by the receipt of Earnest Money
  - e. If the tenderer fails to fulfill the criteria laid down for evaluation of the “Technical cum Commercial bid” as mentioned in the Tender document
  - f. If samples of / models of articles quoted are not submitted as and when required for technical evaluation test
  - g. If the tenderer enters any restriction on other conditions in his tender.
  - h. If the tenderer enters one rate in figures and another in words and declines to abide by the lower of the two.
  - i. If the tenderer alters the period of supply or expunges any clause in the form of tender, and any delay in supply would invite a fee of 1% per week
  - j. If the tender is presented without signature.
  - k. The equipment mentioned in the tenders must meet all the technical specifications. Any item of the equipment not accompanied by the technical brochure printed by the original manufacturer will be dealt as not meeting the technical specifications
  - l. The tenders must meet all the requirements contained in this tender document
  - m. Authorization letter duly signed by the manufacturer in case of Authorized Dealer
  - n. In the event of violation / non-adherence to any other essential requirements mentioned elsewhere within this Tender document
12. The successful tenderer will be required to enter into a contract with the University regarding purchase.
13. The tender documents shall require all tenderers without exception to pay an Earnest Money Deposit ordinarily not exceeding **one per cent** of the value of the procurement by means of a Demand draft drawn in favour of the Registrar, Madurai Kamaraj University, Madurai-625 021 payable at Madurai.
  - i) The Earnest Money will be liable to be forfeited if the tenderer withdraws or amends, impairs or derogates from the tender in any respect within the period of validity of this tender.
  - ii) If the successful tenderer fails to furnish the security deposit then the whole Earnest Money will be forfeited.
  - iii) The rate quoted should be valid for 120 days from the date of opening of the Tender.
14. The tender documents shall require that as a guarantee of the tenderer's performance of the contract, a **security deposit** be taken from the successful tenderer subject to the conditions that the amount of deposit not exceeding **five percent** of the value of the orders placed upto the warranty period.
15. Percentage of payment to be withheld for the effective performance of the contract, provided that withheld amounts do not exceed ten percent of the total value of contract.

16. The tender documents shall specify the period for which the tenderer should hold the prices offered in the tender valid.
17. The tender documents and the contract shall include a clause for payment of liquidated damages and penalty payable by the tenderer in the event of non-fulfilment of any or whole of the contract.
18. The tender documents shall clearly indicate the terms on which the tenderers will be required to quote their price which should be inclusive of all costs of delivery at the final destination such as transportation, payment of duties and taxes leviable, insurance and any incidental services and giving the break up thereof.
19. The tender documents shall clearly indicate the criteria in addition to price which are to be adopted for evaluating the tenders and how such criteria will be quantified or evaluated.
20. Only those firms should respond who are the manufacturers or authorized dealers. A certificate to this effect duly signed by the manufacturer with reference to this tender in respect of all items quoted in the tender should be attached by tenderer(s). A general authorization letter is not acceptable.
21. The cost must include the warranty maintenance for 5 years from the date of installation.
22. Complete address including Phone No., Fax No., E-mail address etc. may be furnished.
23. The Tender should remain valid for a period of six months from the date of the opening of tenders.
24. Only one authorized representative of the tenderer with proper authority letter may attend the opening of the Tender.
25. All documentation is required to be in English.
26. Incomplete tenders and amendments and additions to tender after opening will not be accepted.
27. Fail-safe procedure in detail under following conditions may be indicated in detail.
  - (a) Power failure
  - (b) Voltage variations

The equipment must be capable of withstanding power fluctuations and equipments should not be damaged due to '**trip outs**'. The normal voltage and frequency conditions available at the site

28. Tenderers should include in their tender provision for tools and initial stock of maintenance spares as are essential for proper operation and maintenance of the equipment. Full particulars of spare parts should be provided separately.
29. The successful tenderers shall warranty that spare parts for the system would be available for a minimum period of TEN (10) years after acceptance of the system/equipment. And thereafter before going out of production of the spare parts, he will give a notice prior to such discontinuation.



30. The supplier shall be responsible to obtain all export license for any other Govt. authorization from their Country.
31. The tenderers shall be responsible for erection & installation of the equipment at destination site and for making it fully operational. Payment and terms and conditions if any, for the same would be specified by the tenderer separately.
32. The tenderer shall be fully responsible for the manufacturers warranty in respect of proper design, quality and workmanship of all the equipment accessories etc. covered by the tender for a period of 5 years from the date of satisfactory installation of the system. **The provision for extended warranty with terms and condition thereof, if any, may also be specifically mentioned.**
33. The supplier will have to provide bank guarantee on execution on the contract performance agreement for 5% of the invoice value. The contract performance agreement should be valid during the course of warranty period.
34. **The University reserves the right to purchase or to reject all or part of any of the Tenders without assigning any reasons.**
35. Canvassing in connection with tender / quotation is strictly prohibited.
36. The tenders are to be submitted in sealed envelope **superscribed the Serial Number and the name of the equipment with the cost of tender document for Rs.2,950/- (Rs.2500+Rs.450 GST 18%) to the Registrar, Madurai Kamaraj University, Madurai 625 021 on or before 23.10.2017 at 10.30 a.m. and the technical bid will be opened on 23.10.2017 at 4.00 p.m. in the presence of the tenderers or their authorized representative who would like to be present**

Place: Madurai-21  
Date: 23.10.2017

REGISTRAR i/c