सत्यम् शिवम् सुन्दरम्

**प्रसार भारती**
**PRASAR BHARATI**
**(Broadcasting Corporation of India)**
दूरदर्शन महानिदेशालय
**Directorate General: Doordarshan**
दूरदर्शन भवन, कोपरनिक्स मार्ग,
**Doordarshan Bhawan, Copernicus Marg**
नई दिल्ली - ११०००१
**New Delhi – 110 001**

**File No. 19(2)2018-19E1 (P) TV** **Dated: 01.05.2019**

**Subject:** Draft Technical Specification Procurement of Digital Sync Pulse Generator with Auto Change over Unit.

The Draft specification of the upcoming tenders is enclosed herewith to offer comments and may also submit their budgetary quote, if any by due date at e-mail address ddpurchase401@yahoo.co.in or on following Address:

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Room No. 403,
Directorate General: Doordarshan,
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Specification For: Draft Technical Specification for Procurement of Digital Sync Pulse Generator with Auto Change over Unit.

Specification no: SD 03/2019 Dated: 24.04.2019

Due Date to offer Comments: 14.05.2019

Encl.: As above

01/05/19

Prabhat Kumar Singh
Assistant Engineer
For DG: DD

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

# SPECIFICATIONS FOR DIGITAL SYNC PULSE GENERATOR WITH AUTO CHANGEOVER UNIT

Specifications No.: SD 03/2019
Dated: 29.04.2019

## 1. SCOPE:-

The specifications describe the required performance characteristics of precision multi-format Digital Sync Pulse Generator (SPG) with Auto-Change over Unit (ACO) for master synchronization and reference applications in Digital broadcast Studios and post-production facilities in Doordarshan.

## 2. GENERAL:-

2.1 **The offered equipment should be from an internationally reputed manufacturer and the quoted model should be field proven and in use by leading broadcasters in various continents of the World. The bidder should essentially submit the list of the broadcasters to whom the quoted model has been supplied.**

2.2 The SPG and ACO should be standalone units and each unit should be 19 inch rack mountable.

2.3 The SPG should work either as a Master Generator or in Slave Mode operation by Genlocking the unit, depending on the situation.

2.4 The SPG should provide multiple video reference signals, such as black burst, HD tri-level sync, audio reference signals. It should also provide LTC outputs and VITC on black burst outputs. The SPG should support NTP (Network Time Protocol) also.

2.5 It should have GPS-based synchronization for an accurate time-of-day reference. Necessary GPS receiver, Antenna and connecting cables are also part of the offer.

2.6 Configuration and operation of the SPG and ACO unit should be possible from the front panel selection switches.

2.7 The SPG and ACO unit should have redundant power supplies.

2.8 It should have Ethernet interface for remote access and monitoring system status.

2.9 The Bill of Material required is given in **Appendix-I**. The bidder is required to provide the complete list of items & accessories etc.

offered to meet the specification requirement in the following proforma:

| Sr. No. | Description / Name of the item | Make | Model | Part No., if any | Qty. |
|---|---|---|---|---|---|
| 1. | 2. | 3. | 4. | 5. | 6. |
| | | | | | |

2.10 The list of Doordarshan centers for which the equipment are being procured is as given in **Appendix-II**.

## 3. ESSENTIAL FEATURES:-

3.1 The SPG should have a high accuracy crystal oscillator to provide a stable frequency reference for the system so as to make it ideal, for master generator or GENLOCK input can be used to lock to an external video reference in slave operation, in a TV studio broadcast environment.

3.2 GENLOCK input in the SPG should be either internal reference signal or HD tri-level sync or PAL black burst external reference signal.

3.3 Automatic changeover to internal reference in the absence of the Genlock reference input should be possible.

3.4 It should be able to select the reference signal format manually or automatically.

3.5 All the Analogue Black Burst outputs are to be correctly SCH phased.

3.6 It should have built in GPS receiver

3.7 GPS antenna and 30 metre RF cable with matching connector at both the ends should also be offered.

3.8 The SPG should have minimum 3 independently configurable PAL black burst/ HD tri-level sync 1080/50I outputs.

3.9 The SPG should provide two numbers of independently selectable SD/HD SDI outputs. It should also possible to adjust the SDI signal relative to the reference signal.SDI output includes Colour Bar, Black and SDI Check field.

3.10 It should be possible to access the selection of Internal/External Reference, Genlock and Sync timing preset and other essential control from the front panel selection switches.

3.11 It should be possible to independently adjust the timing of the Analogue Black burst outputs relative to the Genlock source from the front panel.

3.12 The SPG should have minimum 3 independent linear time code (LTC) outputs and one LTC input. Each LTC output should have independent frame rate selection, time source (time-of-day or program time) and time zone offset.

3.13 Vertical interval time code (VITC) available on PAL black output should be with independent time sources and offsets.

3.14 The SPG should have a 48 kHz word clock output also.

3.15 It should be possible to prevent loss of timing settings in the event of power failure by storing the time settings in a non-volatile memory. Timing pre-set should be easily programmable.

3.16 It should be able to backup settings and presets and saved presets can be recalled during operation. These data can be written and saved from SPG using USB memory devices.

3.17 Ambiguous conditions are to be indicated by an LED display on the front panel of the SPG.

3.18 The ACO should automatically switches from the primary signal to the backup signal smoothly when problems are detected in the primary signal. Automatic as well as manual change over should be possible.

3.19 The ACO should have minimum 9 channels and each channel consists of a primary input, a backup input, and an output all on BNCs for SDI, BB and Tri-Level Sync. In addition to this 3 LTC channels should also be there.

3.20 The ACO should accept PAL black burst, HD tri-level sync, SDI, LTC, and word-clock signals. These signals are either switched with relays or with electronic switches.

3.21 Auto mode should have provision of signal amplitude fault detection for automatic switching.

3.22 Whenever an input signal level error is detected Alarms will be generated and will be available on panel LEDs to indicate the channel which is causing the problem for quick notification.

## 4. TECHNICAL SPECIFICATIONS:-

| Sr. No. | Technical Parameter | | Parameter Values |
|---|---|---|---|
| **A.** | **Genlock** | | |
| 1. | Input | : | Two on BNCs, 75 Ω loop- through |
| 2. | Signal | : | PAL-B black burst/ HD tri-level sync. 1080/50I |
| 3. | Amplitude Range | : | ±6dB |
| **B.** | **Reference Outputs:** | | |
| 1. | Format | : | PAL-B black burst, HD tri-level sync. 1080/50I |

| | | | |
|---|---|---|---|
| 2. | Sync Level | : | PAL:-300 mV<br>HD: ±300 mV |
| 3. | SCH Phase | : | < ±5° for PAL |
| 4. | Timing Adjustment | : | Independent per output |
| 5. | Output Connector | : | BNC |
| 6. | Output Impedance | : | 75 Ω |
| 7. | No. of Outputs | : | 3 or more |
| **C.** | **SDI Outputs:** | | |
| 1. | Output Connector | : | BNC |
| 2. | Output Impedance | : | 75 Ω |
| 3. | No. of Outputs | : | 2 or more |
| 4. | Bit Rate | : | SD: 270Mbps<br>HD: 1.485Gbps |
| 5. | HD and SD Test Patterns | : | 100% & 75% Colour BAR, Check field, 100% Flat field white, 100% of R, G & B |
| **D.** | **LTC Outputs:** | | |
| 1. | Number of Outputs | : | 3 or more |
| 2. | Format | : | 25 fps |
| 3. | Source | : | Time-of-day with adjustable offset |
| 4. | Output Amplitude | : | 5 V ±10%, adjustable from 0.5 V to 5 V in 0.5V steps |
| 5. | Connector | : | D-sub |
| **E.** | **Word Clock Output** | | |
| 1. | Connector | : | BNC ×1 |
| 2. | Output Level | : | 1 V AC into 75 Ω (AES level) |
| 3. | Frequency | : | 48 kHz |
| 4. | Timing Adjustment | : | ±1AES/EBU frame |
| **F.** | **GPS Receiver** | | |
| 1. | Type | : | L1 frequency (1575.42 MHz), C/A Code, 12 channels. |
| 2. | Time Accuracy | : | Within 150 ns to GPS/UTC |
| 3. | GPS antenna Connector | : | BNC |
| 4. | Input Impedance | : | 50 Ω, internally terminated |
| 5. | DC Antenna Power Output Voltage | : | 3.3 V or 5 V |
| **G.** | **Automatic Change Over Unit** | | |
| 1. | No. of Channels | : | 9 or more |
| 2. | Connectors | : | BNC and D-sub |
| **H.** | **Control Connectors** | | |
| 1. | Ethernet | : | RJ-45,10BASE-T/100BASE-TX |
| 2. | USB | : | USB 2/3 |
| **I.** | **General** | | |
| 1. | Power Supply | : | 230 V AC ± 5%, 50 Hz |

| | | | |
|---|---|---|---|
| 2. | Total Power Consumption | : | Less than 200 Watt (2 nos. SPG & 1 no. ACO unit) |
| 3. | Operating Temperature | : | 0° C to + 40° C or Better |
| 4. | Storage Temperature | : | - 20° C to + 60° C or Better |
| 5. | Size & Mounting | : | Standard 19" rack mounting for each unit |

## 5. COMPLIANCE:

a) **A point by point full compliance statement laid down in the specifications from the principal manufacturer is to be enclosed along with the offer in the format given below. Mere signature on the copy of DD specifications shall not be accepted as a compliance statement.**

**The figures so mentioned should be supported by record of these in the technical literature enclosed with the tender and reference to the page number of enclosed literature for all features and technical specifications should be mentioned in the relevant column.** Offers without the compliance statement or with incomplete compliance statement will liable to be rejected with the sole responsibility of the bidder. **Any deviation from the specification detailed in the compliance statement is to be highlighted separately.**

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

b) In addition to above, a separate point by point compliance statement duly signed by the bidder in respect of all the points laid down in the specifications should also be submitted along with the bid by the bidder in the above mentioned proforma.

## 6. TECHNICAL LITERATURE:

One set of technical manuals/brochures of the offered equipment are required to be provided along with the tender to facilitate the technical evaluation, otherwise the tender is liable to be ignored. The successful bidder will have to supply a set of technical, user and installation manuals.

## 7. DEMONSTRATION:

If necessary, the bidder may be asked for demonstration of the offered system as part of the technical evaluation. In such case the bidder will have to make suitable arrangement for the demonstration of the offered system at Doordarshan Bhawan, New Delhi, on notice of 15 days. Accordingly the bidder should be in readiness for demonstration.

## 8. GUARANTEE:

a) With reference to the clause no.8.2 of the "General Terms And Conditions (GTC)" under ANNEXURE-II of tender document, the complete system including all items/equipment should be guaranteed for **three years** of trouble free operation from the date of commissioning. In case of any item or equipment failure including software and hardware within this period shall be rectified or replaced free of cost to Doordarshan.

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

## 9. DELIVERY PERIOD:

The delivery period will be 03 months.

## 10. INSPECTION:

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

## 11. ENCLOSURES:

The bidder must necessarily upload the following documents along with the technical bid:

a) Compliance statement with respect to all the points of the specifications duly signed by the OEM should be submitted for offered equipment/item(s) in the proforma mentioned in clause no. 5.(a). 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.

b) A separate point by point compliance statement duly signed by the bidder in respect of all the points laid down in the specifications for the offered equipment/item(s) in the proforma mentioned in clause no. 5.(b).

c) Technical manuals/detailed technical literature/catalogues for the offered equipment/item(s) for substantiating the model no. and technical specifications.

d) Model specific user list of the offered product(s).

e) Any other document mentioned elsewhere in the tender document.

**The tender is liable to be rejected in the absence of the above enclosures with the sole responsibility of the bidder.**

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**Appendix-I**

## INDICATIVE BILL OF MATERIAL (BOM) REQUIRED

| Sl. Nos. | Detail of Items | Qty. |
|---|---|---|
| 1. | Sync Pulse Generator with 19" rack mount kit and built in GPS receiver | 22 Nos. |
| 2. | GPS antenna and 30 meter cable with matching connector at both the ends | 22 Nos. |
| 4. | Auto Changeover Unit with rack mount kit | 11 Nos. |
| 5. | Operation manual/User Guide/ Technical Manual/ Installation Manual etc. | 11 Sets |

**Appendix-II**

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

| Sr. Nos. | Zone | Location of Doordarshan Centre | Qty. |
|---|---|---|---|
| 1. | **North Zone (NZ)** | DD News, Delhi | 3 Sets |
| 2. | | CPC, Delhi | 1 Set |
| 3. | **East Zone (EZ)** | Bhubaneswar | 1 Set |
| 4. | | Kolkata | 1 Set |
| 5. | | Guwahati | 1 Set |
| 6. | **South Zone (SZ)** | Bengaluru | 1 Set |
| 7. | | Chennai | 1 Set |
| 8. | | Hyderabad | 1 Set |
| 9. | | Thiruvananthapuram | 1 Set |
| | | **TOTAL** | **11 Sets** |