

**Specifications for Digital Dual Sync Pulse Generator
with Auto Change Over Unit**

1. Scope:

This specification aims at putting forth the required performance characteristics of Digital Dual Sync Pulse Generator with Auto-Change Over Unit for use in Serial Digital Component environment in Digital broadcast Studio set-up in Doordarshan. The unit shall have to work either as a Master Generator or for its Slave Mode operation by Genlocking the unit.

2. General:

- 2.1 It should conform to ITU-R BT 601; SMPTE 259M, 625/50 Standard.
- 2.2 It should be operationally simple and precise and have long term stability.
- 2.3 It should provide the Analogue Black Burst, SD Black & Digital Test signals like colour bar etc.
- 2.4 The unit should be capable of working in slave mode also.
- 2.5 The SPG system should have high noise immunity.
- 2.6 It should be possible to access the selection of Int. 7 Ext. Reference, Genlock and Sync Timing Preset and other essential controls from the front panel selection switches.
- 2.7 The system should be complete in all respects for proper working.
- 2.8 Specifically, Dual SPG with auto changeover unit should be such that each SPG and Auto Change Over is standalone and should not require PC for its configuration and operation.
- 2.9 Each unit should be mountable in 19" (inch) rack frame.
- 2.10 It should be possible for the two SPG units to work with automatic change over unit without any matching difficulty.

3. Essential Features:

- 3.1 The SPG should have highly stable output so as to make it ideal for either master generator or slave operation, in a TV studio Broadcast environment.
- 3.2 The SPG should have a high accuracy 13.5 MHz/27 MHz internal reference with less than 1 ppm per year long term drift.
- 3.3 All the Analogue Black Burst outputs are to be correctly SCH phased.
- 3.4 Automatic changeover to Internal reference in the absence of the Genlock reference input should be possible.
- 3.5 It should have Analogue Black Burst output, SDI Serial Digital Black & Serial Digital Component Video Test Signal outputs like Colour Bar, Ramp, Multiburst, Bow tie pattern, SDI Checkfield signals & Active picture markers etc.
- 3.6 The SPGs should have embedded AES/EBU tone and Silent output.

- 3.7 It should be possible to embed the Digital Audio into Serial Digital Colour Bars and Black Signals.
- 3.8 The SPG should have minimum 4 Analogue Black Burst outputs.
- 3.9 It should be possible to adjust the timing of the Analogue Black burst outputs relative to the Genlock source from the front panel.
- 3.10 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.
- 3.11 Any ambiguous conditions are to be indicated by an LED display on the front panel.
- 3.12 The Automatic Change Over Unit in case of any failure in one of the SPG's should change over to other SPG smoothly.
- 3.13 Automatic as well as manual change over should be possible in case of the input signal level going down by 2 to 4 dB.
- 3.14 The complete system should be capable of mounting directly in 19" rack frame.

4. Technical Specifications:

4.1 Genlock

- 4.1.1 Input : One 75 Ω looped through or two 75 Ω terminating; BNC
- 4.1.2 Signal : PAL; Black Burst; 300 mV, ± 6 dB, S/N ratio > 40 dB
- 4.1.3 Return loss : Better than 40 dB upto 5 MHz

4.2 Analog Black Burst Outputs:

- 4.2.1 Format : PAL
- 4.2.2 F_{sc} stability : $< \pm 1$ Hz over temp. range 0°C to +40°C
- 4.2.3 SCH Phase : 0 degrees ± 5 degrees
- 4.2.4 Output Connector : BNC
- 4.2.5 No. of Outputs : Four or more

4.3 Serial Digital Video Outputs

- 4.3.1 Standard : Conforming to ITU-R BT601; SMPTE 259M; 625/50
- 4.3.2 Ref. & Test Signal : Colour bar, Black, SDI checkfield, Bow tie pattern, Multiburst, Ramp, Active Picture Marker.
- 4.3.3 Coding/ Resolution : 10 bit or better
- 4.3.4 Bit rate/ Format : 270 Mb/s; scrambled NRZI
- 4.3.5 Amplitude : 800 mV $\pm 10\%$
- 4.3.6 Rise & Fall times : < 1.5 ns.
- 4.3.7 Jitter : < 0.2 UI
- 4.3.8 Return Loss : 15 dB 5 to 270 MHz or better
- 4.3.9 Output Impedance : 75 Ω
- 4.3.10 No. of outputs : 02 or more (SD Black/Bar), 02 or more (SD Test signals).
- 4.3.11 Output Connector : BNC

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4.4 Serial Digital Audio Outputs

- 4.4.1 Standard : AES3; SMPTE 276 M
- 4.4.2 No. of audio Channel : 4, 2 AES/EBU audio pairs
- 4.4.3 Sample rate : 48 kHz locked to video
- 4.4.4 Connector : 2 BNC unbalanced out or more

4.5 Automatic Change Over Unit For Digital SPG Specified

4.5.1 Input & Output

- 4.5.1.1 Return Loss : 30 dB to 10 MHz or Better
14 dB 10 to 270 MHz or Better
- 4.5.1.2 Cross Talk : < - 60 dB upto 10 MHz
< - 30 dB 10 to 200 MHz
< - 15 dB 200 to 360 MHz
- 4.5.1.3 Connectors : BNC

4.5.2.1 Auto as well as manual mode of operation should be possible.

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

4.6 Power Supply & General

- 4.6.1 Power Supply : 220 V AC \pm 10%, 50 Hz
- 4.6.2 Power Consumption : Less than 160 Watt (for the complete set of 2 nos. SPG & 1 no. C/O unit)
- 4.6.3 Operating Temperature : 0° C to + 50° C or Better
- 4.6.4 Storage Temperature : - 40° C to + 60° C or Better
- 4.6.5 Size & Mounting : Standard 19" rack mounting for each unit

5. Compliance:

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

Compliance statement in the format mentioned below shall only be accepted. The manufacturer should also record the performance figures of their equipment offered in the quote for which the compliance statement is enclosed. **The figures so mentioned should be supported by record of these in the technical literature enclosed with the tender and reference to the page number of enclosed literature for all features and technical specifications should be mentioned in the relevant column. Offers without the compliance statement or incomplete compliance statement will be rejected with the sole responsibility of the tenderer.** Any deviation from the specification detailed in the compliance statement is to be highlighted separately.

S. No of DD Specs.	DD Specs.	Compliance (Yes/No)	Performance Fig. of eqpt. Offered.	Reference to the Page Number of enclosed literature	Deviations, in case of non-compliance	Optional items if any Reqd. to make the sys. Compliant to DD specs.	Features in the sys. Offered Which exceed DD Specs.

6. Accessories:

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

7. 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.

8. Demonstration:

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

9. 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.

10. 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.

11. Guarantee:

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

12. Enclosures:

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

- 12.1. 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.
- 12.2. Technical manuals/Detailed technical literature/catalogues for all the offered products for substantiating the technical specification.
- 12.3. Product specific user list of the offered product/system.
- 12.4. 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.