

VariTime™ Digital Sync Generator, PT 5210



- VariTime™, 8 fields for PAL
- VariTime™, 4 fields for NTSC
- VariTime™ subnanosecond delay compensation
- Master applications with internal or external high stability reference
- Genlock to SDI, PAL or NTSC signals for slave applications
- Multistandard: 525/60, 625/50 and dual standard operation
- Reference digital AES/EBU digital audio generation SDI video with or without embedded digital audio, incl. separate word clock output
- Outputs: SDI Black, SDI test signals, analog black burst, analog test signals, AES/EBU digital audio
- Programmable text strings on test signal outputs

The PT 5210 VariTime Digital Sync Generator is a complete system. The Digital Sync Generators are designed to operate as master or slave sync generators in completely digital setups, in mixed analog/digital setups as well as in traditional analog setups.

The PT 5210 is a new development based on the most recent international specifications for signal generation and EMC requirements.

Configuration

The configuration of PT 5210 is based on a basic instrument and several different modules which may be included. The basic PT 5210 outputs the signal required to control a small editing suite, whereas by including several options, the unit may be used to control large combined digital/analog studios with several timeplanes and using digital AES/EBU audio. Test signal generators supplying both composite analog PAL or NTSC as well as SDI test signal generators give even further possibilities.

Master/Genlock Application

Various genlock functions have been included to enable operation as a slave generator. In systems with the traditional analog Black Burst as reference signal, the generator genlocks to this signal. The Black Burst genlock function is included in the standard generator model; a module which genlocks to an incoming SDI reference signal is also available as an option.

The high accuracy/stability of the oven-controlled reference generator (1ppm/year) is sufficient for most applications.

For the very high-end master operation, the unit can be genlocked to external signals like DCF 77 or GPS receiver.



Analog Outputs

The generator may be equipped with up to 8 VariTime™ analog Black Burst outputs. Each of these Black Burst outputs is individually timeable and can be configured as NTSC or PAL in any combination. A completely timeable analog test signal generator may be included.

For small editing suites where the delay capability is not required, a version with one timeable Black Burst output and 7 parallel Black Burst outputs is available.

SDI Serial Digital Black/Color Bar and SDI Test Signal Outputs

Up to 6 SDI timeable black/color bar outputs and 1 SDI test signal output can be installed simultaneously. The SDI black/color bar outputs and signal outputs are configured as pairs and can be timed as pairs within the full digital two field sequence. The outputs can be configured to include EDH and /or embedded silence. The test signal outputs can also include a selection of different embedded audio test signals.

The SDI signals are in general generated as 10 bit signals, except one of the EBU 75% Color Bar signals which is generated with 8 bit according to ITU 801. This 8 bit signal has to be used with some instruments which are giving faulty delay readings with a 10 bit color bar signal.

Multistandard Operation

For operation in multistandard setups, all the analog outputs can be configured independently to either NTSC or PAL. The SDI outputs can also be selected to either the 525/60 or 625/50 format. In all cases genlock to either NTSC or PAL is possible. (Optional genlock to SDI)

AES/EBU Serial Digital Audio Outputs

The Serial Digital Audio generator supplies digital silence and some reference test tones. Some of the audio test signals include audible markers which makes it possible to identify right and left channels by using a loudspeaker.

Preset

Eight complete instrument presets have been included to make it simple to change the configuration for different studio setups. Each of the setups may be given names for fast and easy operation.

Remote Control

An RS-232 remote interface provides full control over all the functions of the generator. Parameters for each of the outputs may be adjusted remotely, and complete setups can be transmitted to and from the instrument.

A parallel TTL interface gives access to programmed presets and outputs instrument status.

Programming of the two instruments in systems including automatic change-over is simplified by use of the copy SPG configuration function. The two instruments are connected directly by use of an RS-232 cable and different presets or the complete instrument setup are copied from one instrument to the other.

Product Data for basic version

Conforms to the relevant ITU, SMPTE, EBU and AES/EBU specifications.

Master Frequency Reference OCXO

- 27 MHz master frequency: 0-50°C: better than 0.25 ppm (ref. 25°C)
- Ageing: < 1 ppm/year

Analog Genlock

- Input: 75 Ω looped through or two 75 Ω terminated inputs (menu configurable)
- Return Loss: >36 dB to 6 MHz
- Genlock signal: M-NTSC, or G-PAL
- Amplitude nominal: ± 3 dB
- S/N Ratio: > 26 dB
- Sc-H phase nominal: $\pm 45^\circ$
- Pull-in range f_{SC} : ± 20 Hz
- Jitter when locked to burst: < 0.5°
- Jitter when locked to sync: < 2 ns
- Timing range PAL: ± 4 field
- Timing range NTSC: ± 2 field
- Timing resolution: $0.5^\circ f_{SC}$

- Continuous frequency reference: 5 MHz, 10 MHz or subcarrier 4.43 MHz or 3.58 MHz
- Amplitude: 1 V ± 3 dB

Analog Genlock Transparent Channel

- The analog genlock signal is transferred directly to a transparent output
- Output Impedance: 75 Ω
- Return Loss: > 36 dB to 6 MHz

Analog Black Burst Output

- Connector: BNC
- Output impedance: 75 $\Omega \pm 0.5 \Omega$
- Return Loss: >36 dB, to 5 MHz
- Sync amplitude: -300mV $\pm 2\%$ or -286mV $\pm 2\%$
- Timing range: PAL: ± 4 field
- Timing range: NTSC ± 2 field
- Timing resolution: $0.5^\circ f_{SC}$
- Sc-H phase: Default 0°, adjustment $\pm 180^\circ$, resolution <1°
- S/N ratio: 60dB unweighted to 5 MHz
- Jitter: ± 0.5 ns

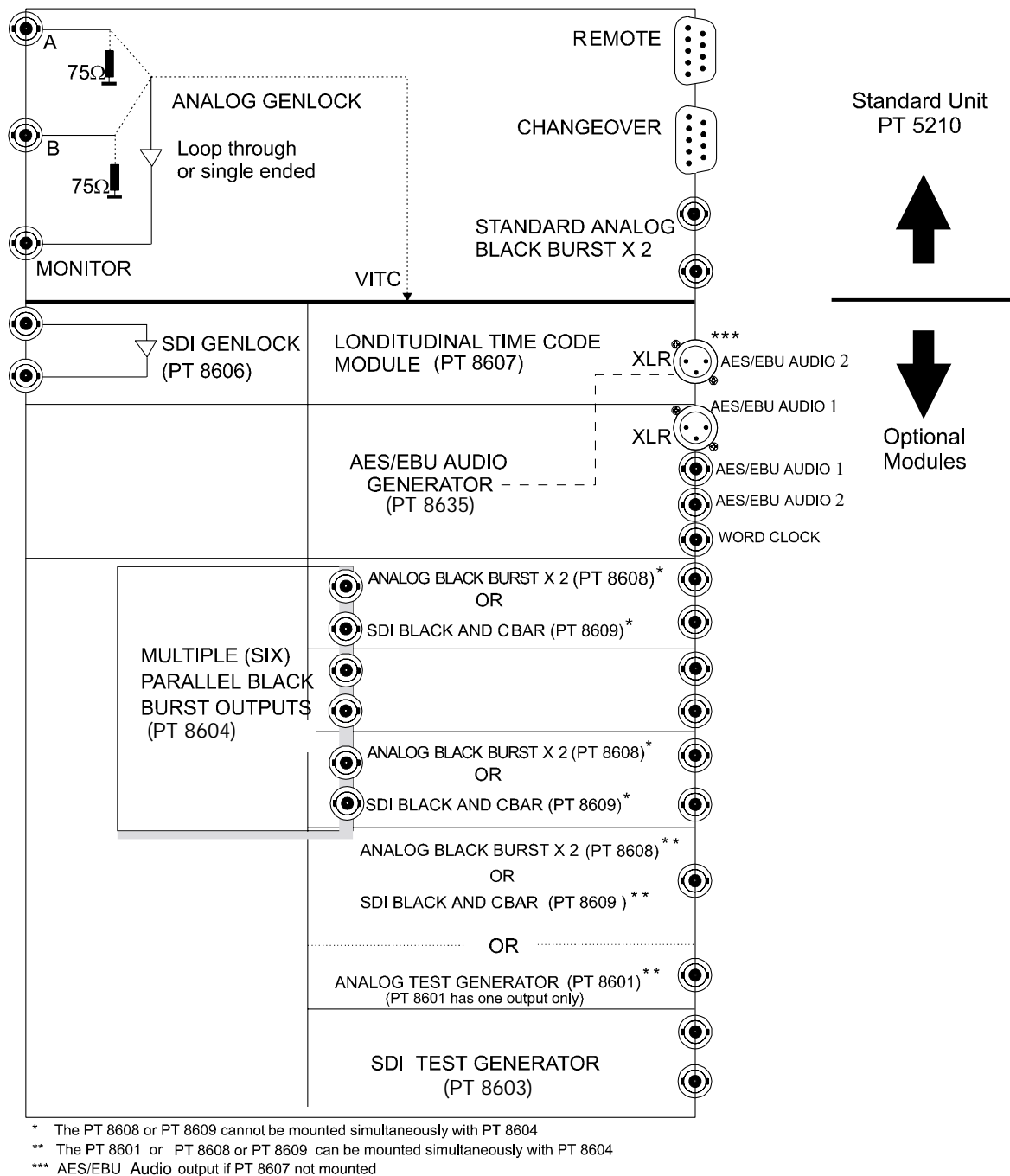
Remote Control

- All functions may be controlled and checked by use of the serial remote interface
- The parallel remote interface gives control over major functions of the generator. The control is by use of TTL compatible ground closure.
- Interface connector 9 pole female sub-D, internally configured to serial RS232C or parallel ground closure.

Configuration

The drawing shows a block diagram of the PT 5210. From this block diagram the different configuration possibilities for the PT5210 can be determined. Please note that some modules can not be mounted simultaneously.
When PT8604 (Six Parallel Black Burst Outputs) is installed, only one PT8608 (Black Burst) or one PT8609 (SDI Black/Color Bar) or the PT8601 (Analog Test Generator) can be installed at the same time.

PT 5210 VARITIME SPG



Fast setup

Readout of the complete instrument setting is possible with a single command from the remote. The data read may be transferred in the same format to another unit for setting up this unit or the two units can be directly connected.

Presets

Eight preset setups are stored in a non volatile memory. The presets may be named with up to 16 upper/lower case letters. The preset name is shown on the display when the preset is active.

Changeover Control

Error signal to control change-over unit. A change-over unit, e.g PT5211, may use this signal to switch to a second SPG in a dual SPG system.

Basic Version PT 5210

1 Genlock input:
Configurable loop-through or single-ended 75 Ohm.
NTSC, PAL, 5 MHz, 10 MHz, 4.43 or 3.58 MHz.
2 individually timeable Black Burst outputs
transparent output of genlock signal.

General Specifications

Power Supply

- Voltage: 100- 240 V AC,
- Frequency 48 - 62 Hz
- Powerconsumption:
< 90 VA maximum with all options

Mechanical Data

- 19" rack mount cabinet
- Height: 44 mm (1.73")
- Width: 483 mm (19")
- Depth: 490 mm (19.3")
- Weight: 6 kg (13.2 lbs)

Environmental Conditions:

- Storage temperature:
- 20 to + 70°C
- Operating temperatur:
+ 5 to + 45°C
- Humidity: non condensing
(IEC 721)

Electromagnetic Compatibility

- EN 50081-1/1994 (emission)
- EN 50082-1/1992 (immunity)
- FCC rules & regulations, part 15, subpart J, level B (emission)

Safety

- Safety according to IEC1010-1

Options

PT 8601 Analog Test Signal Generator

- Patterns: Color Bar (SMPTE, EBU, Split Field), Window 15%, Window 20%, Window 100%, Cross Hatch, Pluge, Safe Area, Shallow Ramp, Multiburst, Red, Black Burst and Staircase
- Source ID

Product Data

- Connector: BNC
- Output Impedance: $75\Omega \pm 0.5\Omega$
- Return Loss: > 36dB, to 5MHz
- Sync Amplitude: -300mV \pm 2% (PAL)
or -286mV \pm 2% (NTSC)

- Timing Range: \pm 4 field (PAL)
or \pm 2 field (NTSC)
- Timing Resolution:
0.5° of Subcarrier
- Sc-H phase: Default 0°, adjustment \pm 180°, resolution < 1°
- S/N Ratio: 60dB unweighted to 5MHz
- Jitter: < \pm 0.5ns

PT 8603 SDI Test Signal Generator 2

- Patterns: Color Bars (525: SMPTE; 625: EBU 75%, EBU 75% (8 bit), 100%, 75% with grey, 75% with red), SDI check field, Shallow Ramp, SDI Timing Test, Window 15%, Window 20%, Window 100%, Cross Hatch, Pluge, Staircase, Black, Multiburst and Red. Embedded sound and EDH may be added to the test signals
- Source ID

PT 8604 Multiple Parallel Black Burst Outputs

- An additional 6 outputs are connected in parallel to one of the Black Burst outputs included as standard

PT 8635 Dual AES/EBU Audio Generator

Two independent serial digital audio generators in one unit, with tone, silence or word-clock. Separate word-clock output is also available. A second Wordclock output can be implemented on request.

BNC Outputs: 2

- Single-ended in compliance to AES3 ID
- Output Impedance: $75 \Omega \pm 20\%$
- Amplitude: $1.0 \pm 10\%$ into 75Ω

XLR Output: 2

- Balanced, in compliance to AES3 1992
- Output Impedance: $110 \Omega \pm 20\%$
- Amplitude: $3 V_{pp}$ typical into 110Ω
- Rise and Fall Times: 10-30 ns
- Jitter: $< \pm 20$ ns

Signal Specification

- Sampling Frequency: 48 kHz
- Data Rate: 3.072 Mbit/s

- Coding: Linear PCM, 20 bit two's complement binary, bi-phase mark coding
- Levels: Silence, 0, -9, -12, -15, -16, -18, -20 dBFS
- Pre-emphasis: None
- Outputs signals:
 - Stereo 1 kHz
 - Stereo 800 Hz
 - Stereo 1 kHz with "click" in ChA
 - Stereo 1 kHz with normal "click" in ChA and long click in ChB
 - Dual 1 kHz in ChA; 400 Hz in ChB
 - Mono 1 kHz
 - Mono 1 kHz with "click" in ChA and ChB

Word-clock output

- Single ended, BNC
- Output Impedance: $75 \Omega \pm 10\%$
- Levels: High $> 2,3$ V; Low $< 0,2$ V into 75Ω
- TTI compatible if unterminated

PT 8606 SDI Digital Genlock

- SDI digital genlock module with active loop-through

PT 8607 Longitudinal Time Code module

- The LTC module transfers VITC time-code from the analog genlock input to a balanced XLR LTC output

PT 8608 Black Burst module

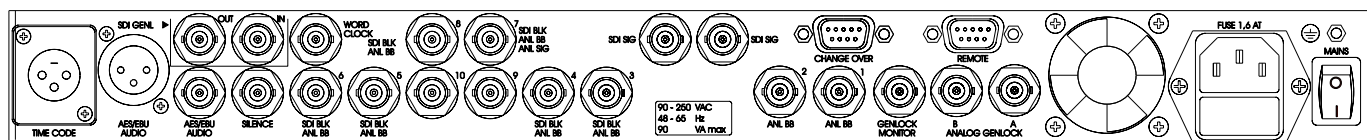
- Two Black Burst outputs. The signal can be timed and individually selected in NTSC or PAL format.

Product Data

- Connector: 2 x BNC
- Output impedance: $72 \Omega \pm 0.5 \Omega$
- Return Loss: > 36 dB, to 5 MHz
- Sync amplitude: -300 mV $\pm 2\%$ or 286 mV $\pm 2\%$
- Timing range: Pal: ± 4 field
- Timing range: Pal: ± 2 field
- Timing resolution: $0.5^\circ f_{SC}$
- Sc-H phase: Default 0° , adjustment $\pm 180^\circ$, resolution $< 1^\circ$
- S/N ratio: 60 dB unweighted to 5 MHz
- Jitter: $< \pm 0.5$ ns

PT 8609 SDI Black/Color bar module

- 2 jointly timeable SDI black/color bar outputs



Rear panel VariTime™ Digital Sync Generator PT 5210

Ordering Information

Order Number

PT 5210 VariTime Digital SPG, basic unit w/2BB 9449 052 10001

Options

PT 8601 Analog Test Signal Generator 9449 086 01001

PT 8603 SDI Test Signal Generator (TSG) 9449 086 03001

PT 8604 Multiple Parallel Black Burst Outputs 9449 086 04001

PT 8606 SDI Digital Genlock 9449 086 06001

PT 8607 Longitudinal Time Code module 9449 086 07001

PT 8608 Black Burst module 9449 086 08001

PT 8609 SDI Black/Color bar module 9449 086 09001

PT 8635 Dual AES/EBU Digital Audio Generator 9449 086 35001

BB = Black and Burst

B/CB = Black/Color Bar

TSG = Test Signal Generator

FOR FURTHER INFORMATION

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