DK-Technologies

VariTime^{TM} Digital Sync Generator
PT5210

solutions in Audio & Video

- VariTime^{TM}, 8 fields for PAL

- VariTime^{TM}, 4 fields for NTSC

- VariTime^{TM} 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 AES3 digital audio generation SDI video with or without embedded digital audio, incl. separate word clock output

- Outputs: SDI Black, SDI test signals, analogue black burst, analogue test signals, AES3 digital audio

- Programmable text strings on test signal outputs

The PT5210 VariTime^{TM} 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 analogue/digital setups as well as in traditional analogue setups.

The PT5210 is based on international specifications for signal generation and EMC requirements.

Configuration
The configuration of PT5210 is based on a basic instrument and several different modules which may be included. The basic PT5210 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/analogue studios with several time planes and using digital AES3 audio. Test signal generators supplying both composite analogue 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 analogue 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 (1 ppm/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.

Analogue Outputs
The generator may be equipped with up to 8 VariTime^{TM} analogue 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 analogue 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/Colour Bar and SDI Test Signal Outputs
Up to 6 SDI timeable black/colour bar outputs and 1 SDI test signal output can be installed simultaneously. The SDI black/colour 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% Colour 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 colour bar signal.

Multistandard Operation
For operation in multistandard setups, all the analogue 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)

AES3 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 make 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 changeover 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 AES3 specifications.

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

Analogue Genlock
- Input: 75 Ohm looped through or two 75 Ohm 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: ± 45°
- 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° f_{sc}

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

Analogue Genlock Transparent Channel
- The analogue genlock signal is transferred directly to a transparent output
- Output Impedance: 75 Ohm
- Return Loss: > 36 dB to 6 MHz

Analogue Black Burst Output
- Connector: BNC
- Output Impedance: 75 Ohm ± 0.5 Ohm
- Return Loss: >36 dB, to 5 MHz
- Sync amplitude: -300mV ± 2% or - 286mV ± 2%
- Timing range: PAL: ± 4 field
- Timing range: NTSC ± 2 field
- Timing resolution: 0.5°f_{sc}
- Sc-H phase:
  Default 0°, adjust-ment ± 180°, 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.

The drawing shows a block diagram of the PT5210. From this block diagram the different configuration possibilities for the PT5210 can be determined. Please note that some modules cannot be mounted simultaneously.

When PT8604 (Six Parallel Black Burst Outputs) is installed, only one PT8608 (Black Burst) or one PT8609 (SDI Black/Colour Bar) or the PT8601 (Analogue Test Generator) can be installed at the same time.

PT5210 VariTime™ SPG
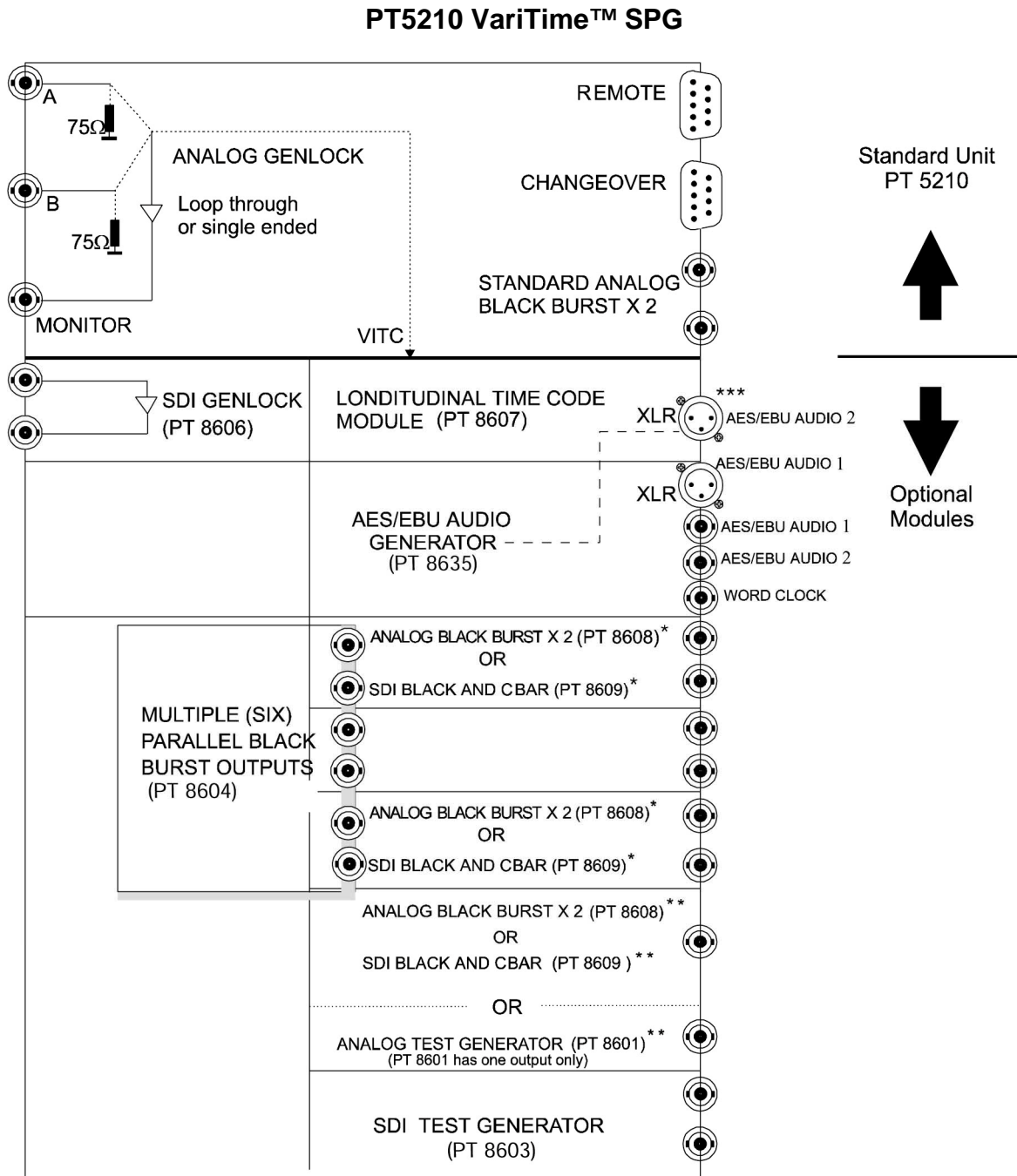
* The PT 8608 or PT 8609 cannot be mounted simultaneously with PT 8604

** The PT 8601 or PT 8608 or PT 8609 can be mounted simultaneously with PT 8604

*** AES/EBU Audio output if PT 8607 not mounted

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 changeover unit. A changeover unit, e.g PT5211, may use this signal to switch to a second SPG in a dual SPG system.

PT5210 Base Version
- High stability oven-controlled crystal oscillater
- Genlock inputs configurable as loop-through or 2 switchable inputs
- Transparent output of the genlock signal
- 2 black burst outputs, individually timeable

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

Analogue Test Signal

PT8601 Analog Test Signal Generator
- Patterns: Colour 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 Ohm ± 0.5 Ohm
- Return Loss: > 36dB to 5MHz
- Sync Amplitude: -300mV ± 2% (PAL) or -286mV ± 2% (NTSC)
- Timing Range: ± 4 field (PAL)or ± 2 field (NTSC)
- Timing Resolution:0.5° of Subcarrier
- Sc-H phase: Default 0^0, adjustment 180°, resolution < 1°
- S/N Ratio: 60dB unweighted to 5MHz Jitter: < ± 0.5ns

SDI Test Signal Generator 2

PT8603 SDI Test Signal Generator 2
- Patterns: Colour 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

Multiple Paralle Black Burst

PT8604 Multiple Parallel Black Burst Outputs
- An additional 6 outputs are connected in parallel to one of the Black Burst outputs included as standard

Dual AES3 Audio Generator

PT8635 Dual AES3 Audio Generator
- Two independent serial digital audio generators in one unit, with tone, silence or wordclock. Separate wordclock 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 Ohm ± 20%
- Amplitude: 1.0 ± 10% into 75 Ohm

XLR Output: 2
- Balanced, in compliance to AES3 1992
- Output Impedance: 110 Ohm ± 20%
- Amplitude: 3 V_{pp} typical into 110 Ohm
- Rise and Fall Times: 10-30 ns
- Jitter: < ± 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

SDI Digital Genlock

PT8606 SDI Digital Genlock
- SDI digital genlock module with active loop-through

Longitudinal Time Code module

PT8607 Longitudinal Time Code module
- The LTC module transfers VITC tim code from the analog genlock input to a balanced XLR LTC output

Black Burst module

PT8608 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 Ohm ± 0.5 Ohm
- Return Loss: > 36 dB to 5 MHz

- Sync amplitude: -300 mV ± 2% or 286 mV ± 2%
- Timing range: PAL: ± 4 field
- Timing range: NTSC: ± 2 field
- Timing resolution: 0.5° f_{sc}
- Sc-H phase: Default 0^0, adjustment ± 180°, resolution < 1°
- S/N ratio: 60 dB unweighted to 5 MHz
- Jitter: < ± 0.5ns

SDI Black/Colour bar module

PT8609 SDI Black/Colour bar module
- 2 jointly timeable SDI black/colour bar output

Rear Panel
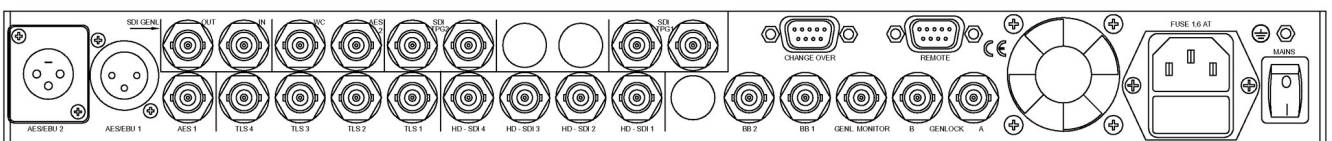
Ordering Information

Base unit

PT5210	VarTime^{TM} Digital SPG, 1 U-19"

Options

PT8601	Analogue TSG option
PT8603	SDI Test Signal generator
PT8604	Multiple Parallel Black Burst gen., 6 outputs
PT8606	SDI Digital Genlock Módule
PT8607	Longitudinal Time Code
PT8608	Black Burst generators, 2 outputs
PT8609	SDI Black/Colour Bar generator
PT8635	Dual AES3 digital audio generator

Contact

Denmark:
DK-Technologies A/S
Marielundvej 37D
DK-2730 Herlev
Tel.: +45 4485 0255
Fax: 45 4485 0250
E-mail: info@dk-technologies.com

Germany:
DK-Technologies Germany GmbH
Ziegeleiweg 16
D-31832 Springe
Tel.: +49 (0)5041 802980
Fax: +49 (0)5041 802999
E-mail: info.de@dk-technologies.com

UK:
DK-Technologies (UK) Ltd.
Unit 20, Universal Marina
Crableck Lane, Sarisbury Green
Southampton SO31 7ZN England
Tel.: +44 870 241 4118
Fax: +44 870 241 4119
E-mail: info.uk@dk-technologies.com

USA:
DK-Technologies America
190 View Circle
Felton, California 95018
Toll Free: +1 800 421-0888
Tel.: +1 831-335-5299
Fax: +1 831-335-5543
E-mail: info.us@dk-technologies.com

DK-Technologies

For more information on this product and for distributors and dealers in your region consult our homepage

www.dk-technologies.net