Digital Video Generator, PT 5230

- **Broad range of test signals for check and alignment.**
- **Up to 4 SDI generators in one 19" rack unit**
- **Multi-format capability, 625/525 SDI - Composite PAL/NTSC**
- **Analog outputs in combination with SDI outputs**
- **Embedded audio and full EDH support**
- **Dual AES/EBU digital audio generator with separate word-clock output.**
- **Moving element in test pattern**
- **Philips or FuBK test pattern**
- **Full genlock timing capability: 2 fields for SDI, 4/8 fields for NTSC/ PAL**
- **Easy operation via menu and direct access to signal groups**
- **Programmable text strings in test pattern generators**
- **Time and date option for test pattern generators**
- **Extremely low jitter**

The PT 5230 Digital Video Generator is specially designed for use in digital and mixed analog/digital video installations and provide all signals needed for fault finding and checking of the entire video chain.

The generator conforms to the relevant ITU, SMPTE, EBU, and AES/ EBU standards.

PT 5230 Basic Generator
The Basic Generator contains a genlockable Sync Generator and 2 Black Burst outputs.

Modular and Multistandard
Several generators can be added to the basic unit making up to 4 different SDI signals available at a time. Instead of SDI generators, up to 2 analog generator modules can be added.

The modular approach enables multiformat configuration: SDI 625, SDI 525, and analog composite PAL and NTSC all in the same instrument. This also makes the generator perfect to use in a mixed digital/analog environment.

AES/EBU Audio Generators, a Digital Genlock Input, and a Time Clock Input can also be added.

SDI Test Signal and Pattern Generators
All SDI generators work in both 625 and 525 line formats, and there are also various complexities to chose from:

- A Basic Test Signal Generator contains less complex test signals, i.e. colorbars, PLUGE, crosshatch, window, etc.
- An extended Test Pattern Generator has a broad range of test signals plus one complex test pattern: "Philips" in 625 line 4:3 format.
- A high-end Test Pattern Generator contains a very wide range of test signals, such as the "Philips" and FuBK test pattern in both 4:3 and 16:9 aspect ratios, as well as other complex test patterns.

Digital audio signals are embedded in all SDI outputs.

Analog Outputs
The analog output module is a dual standard module (PAL or NTSC) which provides test signals and complex test patterns as the "Philips" and FuBK patterns for the analog domain.

Genlock and Timing Adjustment
The PT 5230 is genlockable to a traditional black burst signal, but can also be locked onto continuous wave signals such as subcarrier or other reference

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frequencies. It can even lock onto a 525 Line video signal and still generate PAL and 625 Line SDI signals.

An SDI genlock input module can also be added.

Besides the same genlock phase adjustment for the entire basic instrument, each generator is also independently timeable (indefinite timing over 2 fields for SDI and 4 or 8 fields respectively for NTSC or PAL).

Moving Element in Pattern
To reveal that a serial digital video transmission is “live” and not in a “freeze” condition, a moving element can be selected for some of the complex SDI test patterns.

Text and Clock
Three lines of text can be superimposed onto the video signals. In the complex test patterns the position of the text is optimized for the black text fields.

Clock (date and time) can also be inserted. Date and clock are either controlled by LTC, by VITC or from the internal reference.

Note: Text or clock cannot be added to the Basic SDI Generator signal.

AES/EBU Serial Digital Audio Generators
The Serial Digital Audio Generators supply digital silence and a selection of reference test tones. The unit contains two independent audio generators and a separate word-clock output. Some of the audio test signals include audible markers that make it possible to identify right and left channels by using a loudspeaker.

Ease of Operation
A clearly labeled front plate with separate pushbuttons for quick access to main types of signals, allows intuitive operation. For more complex signal modifications and configurations, an LCD and pushbuttons guide the user through the selections.

Preset
Six complete instrument presets are stored in a non volatile memory. This makes it simple to change the configuration of the outputs for different setups.

Changeover Control
The PT 5230 Digital Video Generator may serve as a fully specified SPG, since it also can serve as backup for a PT 5210 VariTime™ Digital Sync Generator. Built-in fault detection circuitry determines when to send an error flag to the PT 5211 VariTime™ Changeover Unit.

Remote Control
The RS 232 Remote Control Interface provides full control over all functions of the generator. Parameters for each output may be adjusted remotely and a complete setup can be transmitted to and from the instrument.

Instead of an RS 232 control, an internal configuration easily switches the interface to a simple ground closure control, which features a selection of presets and few basic functions.

Product Data

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

Master Frequency Reference
- 27 MHz Master Frequency: better than 0.25 ppm (0-50°C)
- Ageing: < 0.1 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: ± 45°
- Pull-in Range: f_{SC} ± 20 Hz
- Burst Lock Jitter: < 0.5°
- Sync Lock Jitter: < 2 ns
- Timing Range: ± 4 field (PAL) ± 2 field (NTSC)
- Timing Resolution: 0.5° of subcarrier
- Continuous Frequency Reference: subcarrier or 5/10 MHz
- Amplitude: 1V ± 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
Number of Outputs: 2, with independent timing and formats
- Connector: BNC
- Output Impedance: 75 Ω ± 0.5 Ω
- Return Loss: >36 dB, to 5 MHz
- 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°, adjustment ± 180°, resolution < 1°
- S/N Ratio: 60 dB unweighted to 5 MHz
- Jitter: < ± 0.5 ns

Remote Control
The RS-232 remote interface is configurable.
- SCPI-compliant protocol (1995.0)
- Baud Rate: 300 to 9600
- Data Bit: 7 or 8
- Parity: None, Odd, Even
- Handshake: XON/XOFF or RTS/CTS

The parallel remote interface enables selection among the 6 presets and the genlock function via a TTL-compatible ground closure.

Interface Connector: 9 pole female sub-D, internally configured to serial RS232C or parallel ground closure.

Options

Common Characteristics for SDI Outputs
Each generator has two outputs.

- Format: 270 Mb/s component, complies with ITU-R BT 656 and SMPTE 259 M
- Data Format:
  scrambled NRZI 270 Mbit/sec
- Output Impedance: 75 Ω
- Return Loss: >15 dB, 5 to 270 MHz
- Amplitude: 800 mV ± 10%
- Jitter: < 0.25 ns
- Timing Range: ± 1 field
- Resolution: 37 ns (one-half clock cycle on the 13.5 MHz clock)

PT 8639 SDI Test Signal Generator, Basic Signals
Contains the most commonly used test signals, e.g. Colorbars, PLUGE, SDI checkfield, Staircase, Black, etc.

Output can be configured to include EDH, and embedded audio with a limited selection of test tones/silence and levels.

- Source Identification: None

There is a full listing of signals in Table 1

PT 8632 SDI Test Pattern Generator, extended
This generator features an extended range of the commonly used test signals compared to the Basic SDI TSG. The PT 8632 Test Pattern generator also contains the complex “Philips” test pattern in a 625 Line 4:3 aspect ratio.
Output can be configured to include EDH and embedded audio with a selection of test tones/silence and levels.

- Source Identification: Three text strings with up to 16 characters can be added to the signal and with optimal position in the black windows in the “Philips” pattern.

There is a full listing of signals in Table 1.

PT 8633 SDI Test Pattern Generator, high-end
This generator features even more test signals than the PT 8632 SDI TPG. The PT 8633 SDI Test Pattern Generator also contains the complex “Philips” and FuBK test patterns in both 525 and 625 Line versions, in both 4:3 and 16:9 aspect ratios.

Output can be configured to include EDH, and embedded audio with a selection of test tones/silence and levels.

- Source Identification: Three text strings with up to 16 characters can be added to the signal also at optimal position in the black windows in the “Philips” or FuBK patterns.

There is a full listing of signals in Table 1.

PT 8635 Dual AES/EBU Digital Audio Generator
Two independent serial digital audio generators in one unit, with tone, silence or word-clock. A separate word-clock output is also available.

BNC Outputs: 2

- Single-ended in compliance to AES3 ID
- Output Impedance: 75 Ω ± 20%
- Amplitude: 1.0 V ± 10%

XLR Output: 1
(Refer to configuration for dual XLR outputs)

- Balanced in compliance to AES3 1992
- Output impedance: 110 Ω ± 20%
- Amplitude: 3 V_{PP} typical
- 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 twos complement binary, bi-phase mark coding.
- Audio Signals: 1 kHz, 800 Hz, 400 Hz, silence
- Level Silence: 0, -9, -12, -15, -16, -18, -20 dBFS
- Pre-emphasis: None
- Outputs signals:
  - Stereo
  - Stereo with audible click in Ch A
  - Stereo with single click in Ch A and double click in Ch B
  - Dual tone Ch A 1 kHz and Ch B 400 Hz
  - Mono both channels same signal
  - EBU mono both channels same signal with click

Word-clock output

- Single ended BNC

Common Characteristics for Analog Video Outputs

- Connector: BNC
- Output Impedance: 75 Ω ± 0.5 Ω
- Return Loss: > 36 dB, to 5 MHz
- Sync Amplitude: -300 mV ± 2% (PAL) or -286 mV ± 2% (NTSC)
- Video Amplitude (100%):
  700 mV ± 1% (PAL);
  714 mV ± 1% (NTSC)
- Timing Range: ± 4 field (PAL);
  ± 2 field (NTSC)
- Timing Resolution: 0.5° of subcarrier
- Sc-H Phase: Default 0°,
  Adjustment ± 180°, Resolution < 1°
- S/N Ratio: 60 dB unweighted up to 5 MHz
- Jitter: < ± 0.5 ns

Signals	SDI Basic	SDI - TPG PT		Analog TPG
	PT 8639	8632	8633	PT8631
C.BAR				
SMPTE	**M**	**M**	**M**	**M**
EBU/FCC colorbar	**X**	**X**	**X**	**X**
75% colorbar , ITU-801#15	**X**	**X**	**X**	
100% Colorbar	**X**	**X**	**X**	**G**
75% bar with Grey		**G**	**G**	**G**
75% bar with red	**G**	**G**	**G**	**G**
Red, 75%	**X**	**X**	**X**	**X**
M.BURST				
Multiburst in Y, C_R, C_B	**X**	**X**	**X**	
Luminance Sweep		**X**	**X**	**X**
Y, C_R, C_B sweep			**X**	
Multipulse		**X**	**X**	**X**
Sinx/x			**X**	**X**
CCIR 18			**G**	**G**
NTC-7 Combination				**M**
FCC Multiburst				**M**
WINDOW/FLAT				
15% window	**X**	**X**	**X**	**X**
20% window	**X**	**X**	**X**	**X**
100% window	**X**	**X**	**X**	**X**
50% Flat field				**X**
Flat 100%			**X**	**X**
Black/Black Burst	**X**	**X**	**X**	**X**
SPECIAL				
Check field ITU-801 #16	**X**	**X**	**X**	
Timing test		**X**	**X**	
Field Delay Test		**X**	**X**	
Bow Tie		**X**	**X**	
Digital analog Blanking markers		**X**	**X**	
Digital grey ITU-801 #1	**X**	**X**	**X**	
Field square wave		**X**	**X**	**X**
Alternating bl/wh 0.1Hz				
ITU-801 #2			**X**	**X**
End -of-line pulses ITU-801 #3			**X**	
White, end of-line porches ITU-801 #10			**X**	
Blue, end-of-line porches ITU-801 #11			**X**	
Red, end-of-line porches ITU-801 #12			**X**	
Yellow, end-of-line porches ITU-801 #13			**X**	
Cyan, end-of-line porches ITU-801 #14			**X**	
LINEARITY				
Shallow ramp		**X**	**X**	
Luminance Ramp		**X**	**X**	**X**
Limit Ramp ITU-801 #4		**X**	**X**	
Valid ramp		**X**	**X**	
Modulated ramp				**X**
5-step Staircase	**X**	**X**	**X**	**X**
Modulated stairs, 5-step		**X**	**X**	**X**
10-step Staircase			**X**	**X**

Signals	SDI Basic	SDI - TPG PT		Analog TPG
	PT 8639	8632	8633	PT8631
Pulse & bar; 2T, 20T, Bar w. inv 2T		**X**	**X**	**X**
2T, 12.5T, Bar w. inv. 2T			**X**	**X**
CCIR 17			**G**	**G**
CCIR 330			**G**	**G**
CCIR 331			**G**	**G**
FCC Composite				**M**
NTC-7 Composite				**M**
Yellow /Grey ramp ITU-801 #5			**X**	
Grey/blue ramp ITU-801 #6			**X**	
Cyan/grey ramp ITU-801 #7			**X**	
Grey/red ramp ITU-801 #8			**X**	
C_B, Y, C_R ,Y Ramp ITU-801 #9			**X**	
PATTERN				
Philips 4:3		**G**	**X**	**G**
Philips 16:9			**X**	**G**
FuBK 4:3			**G**	**G**
FuBK 16:9			**G**	**G**
Cross Hatch 4:3	**X**	**X**	**X**	**X**
Cross Hatch 16:9				**X**
PLUGE	**X**	**X**	**X**	**X**
Safe area			**X**	**X**
250kHz				**X**
VMT 01			**G**	**G**
Circle 4:3				**G**
Circle 16:9				**G**
EMBEDDED AUDIO				
Audio Group(s)				
Fixed Group 1: CH 1-4	**X**	**X**		
Selectable groups: 1, 2, 3 or 4. All channels in each group			**X**	
Audio signals:				
Off	**X**	**X**	**X**	
Stereo: 800Hz		**X**	**X**	
Stereo 1kHz	**X**	**X**	**X**	
Stereo EBU 1kHz		**X**	**X**	
Stereo BBC 1kHz		**X**	**X**	
Mono EBU 1kHz		**X**	**X**	
Mono 1kHz		**X**	**X**	
Dual 1kHz + 400Hz		**X**	**X**	
Audio levels:				
Silence, 0, -9, -18 dB	**X**	**X**	**X**	
Text & Clock				
-12, -16, -20 dB		**X**	**X**	
Text Insertion		**X**	**X**	**X**
Time ONLY w. Option PT 8637		**X**	**X**	**X**
Special Functions				
Moving Bar		**X**	**X**	

X: Dual standard 625/525 lines or PAL/NTSC
G: 625 Line or PAL only
M: 525 Line or NTSC only

Table 1 Signals Survey

Configuration

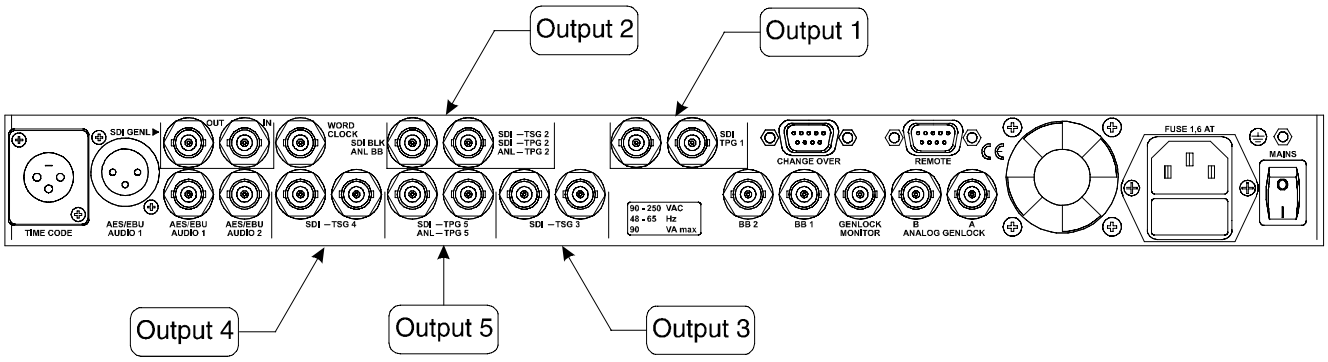
The table and drawing shows the possible combinations of Video Generators that can be installed.

The other options (PT 8606 SDI Digital Genlock and PT 8637 Time Clock Interface) can be installed independently of the video generators.
If no “Time Code” input installed, this position can be used as an XLR output for the second audio generator.

Each of the rows represents a viable combination.

Note:
In most cases Output 2 has to be used before any of the outputs 3, 4 or 5.
PT 8632 SDI Test Pattern Generator can be installed independently of the other generators.

Output 1	Output 2	Output 3	Output 4	Output 5
PT 8632 SDI TPG or empty	PT 8631 Analog TPG	PT 8639 Basic SDI or empty	PT 8639 Basic SDI or empty	
PT 8632 SDI TPG or empty	PT 8631 Analog TPG			PT 8631 Analog TPG or empty
PT 8632 SDI TPG or empty	PT 8631 Analog TPG			PT 8633 SDI TPG or empty
PT 8632 SDI TPG or empty	PT 8633 SDI TPG	PT 8639 Basic SDI or empty	PT 8639 Basic SDI or empty	
PT 8632 SDI TPG or empty	PT 8633 SDI TPG			PT 8631 Analog TPG or empty
PT 8632 SDI TPG or empty	PT 8633 SDI TPG			PT 8633 SDI TPG or empty
PT 8632 SDI TPG or empty	PT 8639 Basic SDI	PT 8639 Basic SDI or empty	PT 8639 Basic SDI or empty	
PT 8632 SDI TPG or empty	Empty	PT 8639 Basic SDI or empty	PT 8639 Basic SDI or empty	



PT 8631 Analog Test Pattern Output
Contains a wide range of the most commonly used test signals in PAL and NTSC: Colorbars, PLUGE, Multibursts, Multipulse, Ramp, Staircase, Test-lines, Window, and Flat-field signals. The PT 8631 Analog test pattern generator also contains the complex “Philips” and FuBK patterns in both 525 and 625 Lines, in both 4:3 and 16:9 aspect ratios.

- Source Identification: Three text strings with up to 16 characters can be added to the signal, also in with optimal position in the black windows in the “Philips” or FuBK patterns.

There is a full listing of signals in Table 1.

PT 8606 SDI Digital Genlock
SDI digital genlock module with active loop-through.

- Connector: BNC
- Input Impedance: 75 Ω
- Format: 270 Mb/s component, complies with SMPTE 259 M and ITU-R BT.656

PT 8637 Time Clock Interface
Reference for the time clock:

- VITC in genlock signal
- LTC on separate XLR connector
- Internal video clock reference
- When power is off: XTAL osc. with battery backup.

The XLR input connector is normally configured for LTC Time code, but can be configured for a 1 second pulse input.

- LTC Input Impedans: > 10 kΩ
- LTC Input Level: 0.8 - 5V_{PP}
- Pulse Input Impedance:
  1 kΩ ± 10%
  (selectable internally: 50 Ω ± 10%)
- Pulse Input Level: 1.8 - 22 V_{PP}
- Pulse Duration: 18 µs - 0.7 s

General Specifications

Power Supply

- Voltage:
  85 - 132 V AC, 180 - 250 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 + 60° C (-68° to 140° F)
- Operating temperature:
  + 5 to + 45° C (41° to 113° F)
- Humidity: non condensing (IEC 721)

Electromagnetic Compatibility

- Complies with EN 50081-1/1994 (emission) and EN 50082-1/1997 (immunity)
- Complies with FCC rules & Regulations, part 15, subpart J, level B (emission)

Safety
Safety according to IEC1010-1

Ordering Information

Basic Unit

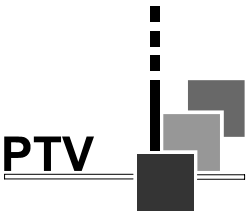
PT 5230	9449 052 30001	Digital Video Generator

Options

PT 8606	9449 086 06001	SDI Digital Genlock
PT 8631	9449 086 31001	Analog Test Pattern Generator
PT 8632	9449 086 32001	SDI Test Pattern Generator, Extended
PT 8633	9449 086 33001	SDI Test Pattern Generator, High-end
PT 8635	9449 086 35001	Duel AES/EBU Digital Audio Generator
PT 8637	9449 086 37001	Time Clock Interface
PT 8639	9449 086 39001	SDI Test Signal Generator, Basic signal

FOR FURTHER INFORMATION

Contact the PTV sales office in your area, or contact us directly:



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