January 21, 2011

[Operating Manual]

Model: PT5300

Software release: 5.8

Default Network Login.

Username: Admin

Password: 2730

Username and password is case sensitive.

Operating Manual - Software release 5.8

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DK-Technologies A/S
Marielundvej 37D
DK-2730 Herlev - Denmark

Phone: (+45) 44 85 02 55
Fax: (+45) 44 85 02 50
www.dk-technologies.com - info@dk-technologies.com

Contents

1 Safety

Read this chapter carefully before installation and use of the instrument.

1.1 Introduction

Adjustment, maintenance and repair of the exposed equipment shall be carried out only by qualified personnel who are aware of hazards involved.

1.2 Safety Precautions

For the correct and safe use of the instrument, it is essential that both operating and servicing personnel follow generally accepted safety procedures in addition to the safety precautions specified in this manual. Specific warning and caution statements, where applicable, are found throughout this manual. Note that warning and caution statements and/or symbols are marked on the instrument as well. This manual provides technical information important for safe operation of the equipment. Please refer to the relevant sections of the manual for technical specifications, installation and operating instructions.

Special attention must be paid to the following issues:

- Protective earthing of the instrument is required for the accessible terminals to be safe. (IEC 1010-1 Safety class I instrument)
- The actual environmental conditions must be checked against the specification.
- Mains voltage must be inside the specified range.

1.3 Use of Caution and Warning Statements

Caution

Used to indicate correct operation or maintenance in order to prevent damage to, or destruction of equipment or other property.

Warning

Used to indicate a potential hazard that requires correct procedures or practices in order to prevent personal injury.

1.4 Symbols

Symbol:	Explanation:
	Caution, risk of electric shock
	Caution (refer to accompanying documents)
	Protective conductor terminal
~	Alternating current

1.5 Impaired Safety Protection

Whenever it is likely that safe operation is impaired, the instrument must be made inoperative and secured against unintended operation. The appropriate servicing authority must be informed. For example, safety is likely to be impaired if the instrument fails to perform the intended functions or shows visible damage.

WARNING: Protection provided by the equipment may be impaired, if the equipment is used in a manner not specified by this manual.

1.6 Technical Assistance

Technical assistance may be obtained from your local DK-Technologies customer support organization or from:

DK-Technologies A/S
Marielundvej 37D
DK-2730 Herlev
Denmark

Phone: +45 4485 0255
Fax: +45 4485 0250
E-Mail: info@dk-technologies.com
Website: http://www.dk-technologies.com/

2 Introduction and Applications

2.1 Introduction

The PT5300 HD-SD Varitime™ Sync Generator is specially designed to fit into HD as well as SD digital and mixed digital/analogue video installations, and it provides signals for synchronization, fault finding and checking of the entire digital chain. Because of its many parallel outputs, the PT5300 is ideal for supplying the video switcher with all commonly used test signals for alignment, but also as a stand-by pattern source.

The basic generator is available as a SD or HD-SD gen-lockable sync / test signal generator with 2 Black Burst outputs. In the HD-SD version it has furthermore 4 Tri-Level sync outputs available.

Several generators can be added to the basic unit, making up to 4 different HD or SD SDI signals available at a time. Instead of SDI generators, one or two analogue test pattern generator modules can be added.

All HD-SD SDI generators are switchable between 625 and 525 lines and the various HD formats, but differ in the number of signals, embedded audio, and other features. The analogue composite generator is a dual standard, PAL and NTSC, and provides test signals and the PTV pattern.

Except for the basic SDI generator, all HD-SD SDI generators and the analogue test pattern generator can superimpose three lines of text on the video signals. With complex test patterns, the text is automatically placed in the black text fields.

Other available options are:

- Dual link HD-SD Test signal generator
- AES/EBU digital audio generator
- Digital genlock
- Time clock interface

The PT5300 is gen-lockable to a traditional Black Burst signal, but can also be locked onto a continuous wave. It can even lock onto a 525-line video signal and still generate PAL, 625-line SD-SDI signals and HD SDI signals in the major parts of formats.

Each of the outputs can be individually timed: SD-SDI signals can be timed in steps of 37 ns over a ± 1 field range; HD-SDI and Tri-Level Sync signals in steps of 6.7 ns, the analogue Black Bursts and test pattern outputs are timeable in steps of 0.5°of subcarrier over a ± 4 field sequence for PAL and ± 2 field sequence for NTSC.

The stability of the internal reference oscillator ensures accurate signals when the PT5300 is acting as a reference generator.

It is not unusual for a Philips stand-by pattern to display the time and date as well; an optional module interfaces with LTC, VITC, or the internal video reference.

AES/EBU digital audio is available on both XLR and BNC connectors. The generator module has two built-in generators, which can be programmed independently with silence or with tones that include signals with audible left/right indication. The AES/EBU output signals are always locked both to the 525-line and 625-line outputs. In multistandard operation, this permits direct connection between AES/EBU generators in 525-line and 625-line environments. A separate word-clock signal is available on a BNC connector.

2.2 Applications

The PT5300 can be used in a multitude of different applications, e.g. delivering signals for a video switcher, as a master and as backup Sync Pulse Generator(SPG) and as a general video signal generator.

In small studios and in OB-vans it can both work as an SPG while also delivering test signals at the same time. It also operates in backup configurations to a PT5210 Varitime™ Digital Sync Generator and a PT5211 Varitime™ Changeover Unit. Built-in fault detection circuitry determines when to send an error flag to the Changeover unit.

One of the SDI test signal generator options supplies all ITU801-specified test signals, as well as other signals. This enables a complete test of the digital video lines and the conversion process to the analogue domain.

In digital distribution networks where data compression is used, a stationary test signal will not reveal if the line is in a "freeze" mode. A moving bar added to the standby pattern will show if the line is open and if the time and date appears in the pattern, this is a good indication that the line is not frozen.

The time information can be locked onto either VITC, LTC, or the internal video reference. The time can be offset to cope with delays in distribution, MPEG-2 coding and transmission. It also ensures that the "true" time can be displayed at the reception point.

Serial digital genlock is used in remote installations where distribution of the master sync takes place via optical fibre. This facility is available in the SDI gen-lock option, PT8606.

Six complete instrument presets have been included to enable quick changes in operation mode. Each of the set-up may be given names with a string of up to a 16 character.

In automated applications, the RS232 remote control interface provides full control over all functions of the generator. Parameters for each output can be adjusted remotely and a complete set-up can be transmitted to and from the instrument.

A Telnet (Ethernet) interface is also available. As with the RS232 interface, the Telnet interface provides full control over all functions of the generator. With the limitation that complete presets can not currently be transmitted through Telnet, the commands and responses are the same as with the RS232 interface.

3 Product Data

3.1 Safety Characteristics

This apparatus has been designed and tested in accordance with the safety Class I requirements of the IEC publication 1010-1 ("Safety Requirements for Electrical Measuring Apparatus"), and is safe as supplied. This manual contains information and warnings, which must be followed during operation to ensure operator and service personnel safety.

3.2 Performance Characteristics

Characteristics expressed in numerical values with stated tolerances are guaranteed tolerances, when the instrument is calibrated at 20-30°C and after 20 min. warm-up. Specified non-tolerance numerical data indicate typical values at nominal ambient temperature (25°C) and reflects an average performance.

3.3 Versions

The generator is based on two basic versions, one for SD-SDI and analogue applications and one for HD-SD SDI and analogue applications. The HD SD version includes the Tri-level Sync option (PT 8611). Both versions are gen-lockable sync pulse generators with further 2 x Black Burst outputs as well. To the basic configuration a number of units can be added.

The apparatus is a multiformat, simultaneously covering SD-SDI (625/525), analogue PAL and analogue NTSC and the extended version with additional HD Tri-level sync outputs as well as HD-SDI test signal outputs. A Dual Link HD-SD-SDI generator is also available.

Additional modules covering an AES/EBU Audio generator, Digital Gen-lock input and a Time clock Interface.

All SD-SDI generators work both in 625 and 525 lines, and can be chosen between different complexities:

- The standard TSG (PT8603) contains all test signals, i.e. Colourbar, PLUGE, crosshatch needed in standard SPG setup where some test signals are required.
- The Basic TSG (PT8639) contains less complex test signals, i.e. Colourbar, PLUGE, crosshatch, etc.
- The Extended Test Pattern Generator (PT 8632) has a broad range of test signals plus one complex test pattern: PTV pattern in 625-lines, 4:3 format (separate version with FuBK pattern).
- The high-end Test Pattern Generator (PT 8633) contains a very wide range of signals, such as PTV and FuBK test patterns in both 4:3 and 16:9 aspect ratio as well as other multistandard complex test patterns.

All HD SD-SDI generators work in 16 different HD formats plus the SD-SDI formats 625 and 525 lines, where the Tri-Level sync option (PT8611) work with 19 different HD formats.

3.4 Options

PT8603	SDI Test Signal Generator
PT8604	Multiple Parallel Black Burst, 6 Outputs
PT8606	SD-SDI Digial Genlock
PT8508	Dual Black Burst Generator
PT8609	SDI Black and Colour Bar Generator
PT8611	Quad HD Tri-Level Sync Generator
PT8612	HD-SD SDI Test Signal Generator
PT8613	Dual link HD-SD Test Signal Generator
PT8616	GPS Genlock and LTC Generator
PT8631	Analogue Test Pattern Generator
PT8632	Test Pattern Generator, Extended
PT8633	SDI Test Pattern Generator, High-end
PT8635	Dual AES/EBU Digital Audio Generator
PT8637	Time Clock Interface
PT8639	SDI Test Signal Generator, Basic Signals
PT8643	Ethernet module.

PT8552	Slide Rail Mounting Kit

Note: PT8632 comes in two versions:

- PT8632/00 with Philips test pattern
- PT8632/10 with FuBK test pattern

3.5 Basic Instrument

3.5.1 Master Frequency Reference

27 MHz master frequency:	Better than 0.25 ppm (0-50°C, ref. 25°C)
Ageing:	$<$ 0.1 ppm/month

3.5.2 Analogue Genlock

Input:	75 Ω looped through or two 75 Ω terminated inputs (menu configurable)
Return loss:	$>$ 38 dB to 6 MHz

3.5.3 Genlock Signal (M-NTSC or G-PAL)

Amplitude:	Nominally ± 3 dB
S/N ration:	$>$ 26 dB
Sc-H phase:	Nominally ± 45°
Pull-in range fsc:	± 20 Hz
Jitter when locked to burst:	$<$ 0.5°
Jitter when locked to sync:	$<$ 2 ns
Timing range:	PAL: ± 4 fields NTSC: ± 2 fields
Timing resolution:	0.5°fsc

3.5.4 Genlock Signal

Continuous frequency reference:	Subcarrier, 5 or 10 MHz
Amplitude:	1 V ± 3 dB

3.5.5 Analogue Genlock Transparent Channel

The analogue genlock signal is transferred via an AC-coupled amplifier to a transparent output.

Output impedance:	75 Ω
Return loss:	> 36 dB to 6 MHz

3.5.6 Analogue Black Burst Outputs

Number of outputs:	2, independently timeable
Connector:	BNC
Return loss:	75 Ω ± 0.5 Ω
Sync Amplitude:	PAL: -300 mV ± 2% NTSC: -286 mV ± 2%
Burst Amplitude:	PAL: -300 mV ± 2% NTSC: -286 mV ± 2%
Timing range:	PAL: ± 4 fields PAL: ± 2 fields
Timing resolution:	0.5°fsc
Sc-H phase:	Default 0°, adjustment ± 180°, resolution < 1°°
S/N ratio:	60 dB unweighted to 5 MHz
Jitter:	Burst jitter: ± 0.5° Sync jitter: ± 0.5 ns (based on design and burst jitter value)
Output monitoring:	Continuous of output level with error flag on "Changeover" connector. Detectors can be disabled

3.6 Communication interface

The PT5300 is equipped with a 9 pole male D-Sub connector which provides RS232 communication to the instrument. Please see section 7 for more information about remote control of the PT5300.

The latest version of the PT5300 is as standard also equipped with a PT8643 Ethernet module. This module provides a Telnet interface for remote control and an optional SNTP v4 Time Server. The SNTP option requires that a PT8616 GPS genlock module is installed.

ATTENTION!

It is strongly advised to change the default username and password for the Ethernet interface.

Please see section 10.3 for further information.

If both the computer and the PT5300 is configured with a static IP address (and the same Subnet Mask) a straight-trhough or crossover Ethernet cable can be used to connect the computer and the PT5300 directly.

3.7 Changeover Control

A built-in fault detection circuitry determines when to send an error flag to the PT5211 Varitime™ Changeover Unit. Detector for each output can be disabled internally.

3.8 Presets

Six complete instrument preset are stored in a non-volatile memory.

The presets have names consisting of up to 16 letters. The preset name is displayed when the preset is active.

3.9 Options

3.9.1 PT8603 SD-SDI Pattern Generator

- Output Signals:
  Colorbar
  525 line: SMPTE
  625 line: EBU 75%, ITU 75% (8 bit), Colourbar 100%, Split Field 75% with gray, and Split Field 75% with red
- SDI Checkfield
- Shallow Ramp
- Digital Timing Test Pattern
- Black
- Window 15%
- Window 20%
- Window 100%
- Cross hatch
- PLUGE
- Multiburst
- 75% Red
- Staircase signal, 5 steps
- Staircase signal, 10 steps

Embedded sound and EDH may be added to the test signals. All signals are generated with 10 bit except otherwise is specified.

3.9.2 PT8604 Multiple Parallel Black Burst, 6 Outputs

Additional 6 parallel BB outputs available are connected to the BB 2 output in the basic version All 6 outputs having the same time plane as BB2.

Connectors:	6 x BNC
Output Impedance:	75 $\Omega \pm 0.5\ \Omega$
Return loss::	$>$ 36 dB, up to 5 MHz
Sync Amplitude:	300 mV $\pm$ 2%, (PAL), 286 mV $\pm$ 2%, (NTSC)
Burst Amplitude:	300 mV $\pm$ 2%, (PAL), 286 mV $\pm$ 2%, (NTSC)
Timing:	Equal to BB2 output, max. Delay 50 ns
Sc-H phase:	Equal to BB2 output
S/N ratio:	Better than 60 dB unweighted to 5 MHz
Jitter:	$<$ 0.5 ns

3.9.3 PT8606 SD-SDI Digital Genlock

SDI digital gen-lock module with active loop-through, 1 input.

Connectors:	2 x BNC
Input/Output Impedance:	75 Ω
Format:	270MB/s component

Complies with SMPTE 259M and ITU-R BT.656

3.9.4 PT8608 Dual Black Burst Generator

2 Black Burst generators individually configurable to PAL or NTSC

Number of outputs:	2 with independent timeable outputs
Connectors:	2 x BNC
Output Impedance:	75 $\Omega \pm 0.5\ \Omega$
Return loss::	$>$ 36 dB, up to 5 MHz
Sync Amplitude:	300 mV $\pm$ 2%, (PAL), 286 mV $\pm$ 2%, (NTSC)
Burst Amplitude:	300 mV $\pm$ 2%, (PAL), 286 mV $\pm$ 2%, (NTSC)
Timing range:	$\pm$ 4 fields (PAL), $\pm$ 2 fields (NTSC)
Timing resolution:	0.5°of subcarrier
Sc-H phase:	Default 0°, adjustment $\pm$ 180°, resolution $<$ 1°
S/N ratio:	Better than 60 dB unweighted to 5 MHz
Jitter:	$<\pm$ 0.5 ns

3.9.5 PT8609 SDI Black and Colour Bar Generator

Each board has two identical outputs

Signals:	SD-SDI black, EBU 75% and 100% colour bar (625 lines), or SMPTE colour bar (525 lines)
Formats:	270 Mb/s component, complies with ITU-R BT 656 and SMPTE 259M
Data format:	Scrambled NRZI 270Mb/s
Connectors:	2 x BNC
Output Impedance:	75 Ω
Return loss::	$>$ 15 dB, 5 to 270 MHz
Amplitude:	800 mV $\pm$ 10%
Jitter:	$<$ 0.2 UI
Timing range:	$\pm$ 1 field
Timing resolution:	37.5 ns (one half cycle of the 13.5 MHz clock)
Embedded Audio:	Silence on/off
Ancillery data:	EDH: on/off Ancillary data on/off

3.9.6 PT8611 Quad HD Tri-Level Sync Generator

4 generators individually configurable to 20 HD Tri-Level Sync formats

Number of outputs: 4 with independent timeable outputs
HD Formats: 720p, 1080i, 1080p. Frame rates as listed in table 1

Format 1)	PT 8611 Tri-Level Sync	Gen-lock to BB/SDI	
1080p/60	x		HD 1080p
1080p/59.94	x		
1080p/50	x		
1080p/30	x		
1080p/29.97	x	x	
1080p/25	x	x	
1080p/24	x		
1080p/23.98	x		
1080i/30	x		HD 1080i
1080i/29.97	x	x	
1080i/25	x	x	
1080sF/30	x		HD 1080sF
1080sF/29.97	x	x	
1080sF/25	x	x	
1080sF/24	x		
1080sF/23.98	x		
720p/60	x		HD 720p
720p/59.94	x	x	
720p/50	x	x	
720p/30	x		
720p/29.97	x	x	
720p/25	x	x	
720p/24	x		
720p/23.98	x		
576i/25 (625)		x	SD
487i/29.97 (525)		x	

Table 1: HD Tri-Level sync formats supported by PT5300HD

Connectors: 4 x BNC
Output Impedance: 75 Ω
Return loss:: $>$ 30 dB, 5 to 30 MHz
Amplitude: 600 mV_{pp} $\pm$ 2%
Jitter: $<\pm$ 2%

3.9.7 PT8612 Quad HD-SD serial digital test signal Generator

Four generators individually configurable with HD and SD test signals

Number of outputs: 4 with independent timeable outputs
HD Formats: 720p, 1080i, 1080p. Frame rates as listed in table 2

Signals:

- **Video:** EBU Colour Bar, 75% with 100% white; Colour Bar, 100%, with 100% white; SDIcheckfield; PLUGE; window signals; clapper board; luminance ramp; combination pattern with selectable colour bar - white ramp - LIP SYNC - 75% red; Black, full field; white, full field from -5% to 105% in 5% increments; white, window from 5% to 105% in 5% increments; cross hatch, 16 x 9
- **Text:** Moving text string with up to 3 lines of 16 characters each line inserted in the test signals
- **Audio:** Test-tones embedded in the HD-SD SDI signals

Format 1)	PT8611 Tri-Level Sync	Gen-lock to BB/SDI	
1080p/60	x		HD 1080p
1080p/59.94	x		
1080p/50	x		
1080p/30	x		
1080p/29.97	x	x	
1080p/25	x	x	
1080p/24	x		
1080p/23.98	x		
1080i/30	x		HD 1080i
1080i/29.97	x	x	
1080i/25	x	x	
720p/60	x		HD 720p
720p/59.94	x	x	
720p/50	x	x	
720p/30	x		
720p/29.97	x	x	
720p/25	x	x	
720p/24	x		
720p/23.98	x		
576i/25 (625)		x	SD
487i/29.97 (525)		x	

Table 2: HD-SD serial digital test signals supported by PT5300HD

Connectors: 4 x BNC
Output Impedance: 75 Ω $\pm$1%
Return loss:: $>$ 15 dB, 5 to 1.5 GHz
Amplitude: 800 mV_{pp} $\pm$ 2%
Jitter: $<\pm$ 1/2 frame
Timing resolution:
- **HD:** 6.7 ns
- **SD:** 6.7 ns

3.9.8 PT8613 Dual link HD-SD Test Signal Generator

Two generators individually configurable, Multiformat HD Dual link, HD Single link and SD-SDI test generator. Dual link in 1080p, 1080i and 1080sF formats only.

Number of outputs:	2 generators independently timeable. Each of the two generators have link A and link B for dual link operation
HD Formats:	720p, 1080i, 1080p, 1080sF. Frame rates as listed in table 3
Video interface:	
HD Dual Link:	GBRA 4:4:4:4 12-bit GBR 4:4:4 10-bit YC_BC_R4:4:4:4 12-bit YC_BC_R4:4:4 10-bit YC_BC_R4:2:2:4 12-bit
Single Link:	HD; YC_BC_R4:2:2 10-bit SD; YC_BC_R10-bit.

Signals:

- **Dual Link Video:** EBU Colour Bar, 75% with 100% white; Colour Bar, 100%, with 100% white; SDI-checkfield; PLUGE; window signals; clapper board; luminance ramp; combination pattern with selectable colour bar - white ramp - LIP SYNC - 75% red; Black, full field; white, full field from -5% to 105% in 5% increments; white, window from 5% to 105% in 5% increments; cross hatch, 16 x 9
- **Single Link Video:** same signals and same timing as mentioned above but output B is just black video
- **Text:** Moving text string with up to 3 lines of 16 characters each line inserted in the test signals. The font size can be changed as well as the font colour and the background colour. The position of the text can be in a fixed pos. and/or it can be moved horizontally and vertically
- **Audio:** 16 channels of audio can be embedded into the video stream. In Dual Link operation the audio is embedded in link A
- **Audio Signals:** Silence, Sine, Click
- **Audio Levels:** 0dBFS, -6dBFS,-12dBFS, -18dBFS, -20dBFS, -24DBFS
- **Lip Sync timing:** $\pm$ 500 ms relative to video, adjustable

Connectors:	4 x BNC
Output Impedance:	75 Ω $\pm$1%
Return loss::	$>$ 15 dB, 5 to 1.5 GHz
Amplitude:	800 mV_{pp} $\pm$ 2%
Jitter:	$<\pm$ 1/2 frame
Timing resolution:	
- **HD:**	6.7 ns
- **SD:**	6.7 ns

Embedded audio: 16 channels of audio can be embedded into one video stream. In dual link operation the audio is embedded in link A.

Audio Signals:	Silence, Sine wave, click
Audio Levels:	0 dBFS, -6 dBFS, -12 dBFS, -18 dBFS, -24 dBFS
Lip sync timing:	$\pm$ 500 ms relative to video

Format 1)	PT8613 TSG	Gen-lock to BB/SDI	
1080p/60			HD 1080p
1080p/59.94			
1080p/50			
1080p/30	x		
1080p/29.97	x	x	
1080p/25	x	x	
1080p/24	x		
1080p/23.98	x		
1080i/30	x		HD 1080i
1080i/29.97	x	x	
1080i/25	x	x	
1080sF/30	x		HD 1080sF
1080sF/29.97	x	x	
1080sF/25	x	x	
1080sF/24	x		
1080sF/23.98	x		
720p/60	x		HD 720p
720p/59.94	x	x	
720p/50	x	x	
720p/30	x		
720p/29.97	x	x	
720p/25	x	x	
720p/24	x		
720p/23.98	x		
576i/25 (625)	x	x	SD
487i/29.97 (525)	x	x	

Table 3: HD dual / single and SD serial digital test signals supported by PT5300HD

3.9.9 PT8616 GPS Genlock and LTC Generator

GPS active antenna input:

Connectors:	1 x BNC
Input Impedance:	50 Ω
Active amplifier supply voltage:	3.3 V
Max power consumption:	0.165 W

LTC outputs:

Connectors:	1 x XLR, balanced output, 110 Ω
(Alternative)	2 x BNC, balanced output, 50 Ω
Output voltage:	1 V_{pp}
Timing:	± 500 ms
Step size:	6.7 ns

Stability:

Accuracy:	15 ns
Absolute long term drift:	$>$ 15 μs
Absolute short term drift:	$>$ 1 μs

Supported LTC formats:

625 lines, 25 FPS, (PAL)
525 lines, 29.97 FPS, (NTSC - dropframe)
525 lines, 29.97 FPS, (NTSC - non dropframe)
30 FPS
24 FPS

Standard boot up time, (depending on sky view)

Cold start:	44 s
Warm start:	18 s

Included features:

Selectable switching for daylight saving time:
1: None
2: Confirm
3: Auto

Individual timing offset for both LTC outputs:
± 500 ms offset range

3.9.10 PT8631 Analogue Test Pattern Generator

Connectors:	2 x BNC
Output Impedance:	75 $\Omega \pm 0.5\ \Omega$
Return loss:	$>$ 36 dB, up to 5 MHz
Sync amplitude:	PAL: -300 mV $\pm$ 2% NTSC: -286 mV $\pm$ 2% (40 IRE$\pm$ 1 IRE)
Video amplitude:	PAL: 700 mV $\pm$ 1% NTSC: 714 mV $\pm$ 1% (100 IRE$\pm$ 1 IRE)
Burst amplitude:	PAL: 300 mV $\pm$ 2% NTSC: 286 mV $\pm$ 2% (40 IRE$\pm$ 1 IRE)
Timing range:	PAL: $\pm$ 4 fields NTSC $\pm$ 2 fields
Timing resolution:	0.5°at f_{SC}
Sc-H phase:	Default 0°, adjustment $\pm$ 180°, resolution $<$1°
PAL colour ID:	Line 7 field 1 (selectable ON/OFF)
S/N ratio:	60 dB unweighted to 5 MHz
Burst Jitter:	$\pm$ 0.5°
Sync jitter:	0.5 ns (based on design and burst jitter value)
Frequency response:	$\pm$ 1% up to 5 MHz
Group delay:	$<$ 10 ns up to 5 MHz
Chrominance / Luminance delay:	$<$ 5 ns
Static non-linearity:	$<$ 1%, typically 0.5%
Diff. Gain:	$<$ 0.6%, typically 0.2%
Diff. Phase:	$<$ 0.6°, typically 0.2°

Output signals:

- Colourbars
- **525-lines NTSC:**
  - SMPTE bar
  - FCC Colourbar
  - Red 75%
- **625-lins PAL:**
  - EBU bar
  - 100% bar
  - 75% bar with grey
  - 75% bar with red
  - Red, 75%
- Multiburst
- Luminance sweep
- Multipulse
- Sinx/x
- Test lines:
  - **PAL:**
  - CCIR18
  - CCIR17
  - CCIR330
  - CCIR331
  - **NTSC:**
  - NTC-7 Combination
  - NTC-7 Composite

  - FCC Multiburst
  - FCC Composite
- 15% window
- 20% window
- 100% window
- 50% flat field
- 100% flat field
- black
- Field squarewave
- Alternating Black/White, 0.1 Hz
- Luminance ramp
- Modulated ramp
- Staircase, 5 steps
- Modulated staircase, 5 steps
- Staircase, 10 steps
- Pulse and bar
- Crosshatch, 4:3 and 16:9 format
- PLUGE
- Safe area
- VMT01 test pattern (only 625 lines)
- Circle on black background, 4:3 aspect ratio
- Circle on black background, 16:9 aspect ratio
- VMT01 test pattern (only 625 lines)
- Circle on black background, 4:3 aspect ratio
- Circle on black background, 16:9 aspect ratio
- Philips test pattern:
  - 625 lines in 4:3 aspect ratio
  - 625 lines in 16:9 aspect ratio
  - 525 lines in 4:3 aspect ratio
  - 525 lines in 16:9 aspect ratio
- FuBK test pattern:
  - 625 lines in 4:3 aspect ratio
  - 625 lines in 16:9 aspect ratio

Note: The Philips test pattern can be configured in respect to:

- 5/10 step staircase
- Anti-PAL ON/OFF
- PLUGE ON/OFF

Source Identification:

Standard signals:	Three strings with up to 16 characters can be added to the signal
Philips Test Pattern:	Text in upper and lower text area. Time and date inserted in centre part of crosshatch lines

Output monitoring

Continuous of output level with error flag on “Change-over” connector. Detector can be disabled.

3.9.11 PT8632 SDI Test pattern Generator, Extended

Connectors:	2 x BNC
Format:	270 Mb/s component Complies with ITU-R BT 656 and SMPTE 259M
Data format:	Scrambled NRZI 270 Mbit/s
Output Impedance:	75 Ω
Return loss:	> 15 dB, 5 to 270 MHz
Amplitude:	800 mV ± 10%
Jitter:	<0.2 UI (one UI equals 3.7 ns)
Timing range:	525/60: ± 1 field 625/50: ± 1 field
Timing resolution:	37.5 ns (one half clock cycle on the 13.5 MHz clock)
Ancillary data:	
EDH:	ON/OFF
Embedded audio:	
Position:	Audio group 1, channels 1-4
Output signals:	Stereo 800Hz, No click Stereo 1 kHz, No click Stereo EBU 1 kHz, Single click in Ch. A Stereo BBC 1 kHz, Single click in Ch.A and double click in Ch.B Mono EBU 1 kHz, Single click in both Ch. A and Ch. B Mono, No click Dual, 1 kHz in Ch. A, 400Hz in Ch. B, No Click Wordclock, 48 kHz
Output levels:	Silence, 0, -9, -12, -15, -16, -18, -20 dBFS
Preemphasis:	None

Output signals:

- Colourbar
- **525-lines:**
  - SMPTE bar
  - FCC Colourbar
  - 75% Colourbar, ITU 801 (timing and levels acc. to ITU801)
  - 100% bar
  - Red 75%
- **625-lines:**
  - EBU
  - 75% Colourbar, ITU 801 (timing and levels acc. to ITU801)
  - 100% Bar
  - 75% bar with grey
  - 75% bar with red
  - Red, 75%
- Multiburst in Y,CR and CB
- Luminance sweep
- Multipulse
- 15% window
- 20% window
- 100% window
- Black
- Check Field
- Timing Test

- Field delay test
- Bow-Tie
- Digital/Analogue markers
- Digital Grey
- Field squarewave
- Shallow Ramp
- Luminance ramp
- Limit Ramp
- Valid Ramp
- Staircase, 5 steps
- Modulated staircase
- Pulse and bar
- Crosshatch
- PLUGE
- Philips test pattern: 625 lines in 4:3 aspect ratio

Note: The Philips test pattern can be configured in respect to:

- Moving bar On/Off
- 5/10 step staircase
- Anti-PAL On/Off

Version PT8632/10

In this version of the SDI generator, the Philips test pattern has been exchanged with a FuBK test pattern in 4:3 aspect ratio

Source Identification:

Standard signals:	Three strings with up to 16 characters can be added to the signal
Philips Test Pattern:	Text in upper and lower text area. Time and date inserted in centre part of crosshatch lines

Output monitoring

Continuous of output level with error flag on “Change-over” connector. Detector can be disabled.

3.9.12 PT8633 SDI Test pattern Generator, High-end

Connectors:	2 x BNC
Format:	270 Mb/s component Complies with ITU-R BT 656 and SMPTE 259M
Data format:	Scrambled NRZI 270 Mbit/s
Output Impedance:	75 Ω
Return loss:	> 15 dB, 5 to 270 MHz
Amplitude:	800 mV ± 10%
Jitter:	< 0.2 UI (one UI equals 3.7 ns)
Timing range:	525/60: ± 1 field 625/50: ± 1 field
Timing resolution:	37.5 ns (one half clock cycle on the 13.5 MHz clock)
Ancillary data:	
EDH:	ON/OFF
Embedded audio:	
Position:	Audio group 1, 2, 3 or 4 (only one group at a time), all channels in each group
Output signals:	Stereo 800Hz, No click Stereo 1 kHz, No click Stereo EBU 1 kHz, Single click in Ch. A Stereo BBC 1 kHz, Single click in Ch.A and double click in Ch.B Mono EBU 1 kHz, Single click in both Ch. A and Ch. B Mono, No click Dual, 1 kHz in Ch. A, 400Hz in Ch. B, No Click Wordclock, 48 kHz
Output levels:	Silence, 0, -9, -12, -15, -16, -18, -20 dBFS
Preemphasis:	None

Output signals:

- Colourbar
- **525-lines NTSC:**
  - SMPTE bar
  - FCC Colourbar
  - 75% Colourbar, ITU 801 (timing and levels acc. to ITU801)
  - 100% bar
  - Red 75%
- **625-lins PAL:**
  - EBU bar
  - 75% Colourbar, ITU 801 (timing and levels acc. to ITU801)
  - 100% bar
  - 75% bar with grey
  - 75% bar with red
  - Red, 75%
- Multiburst in Y,C_B and C_R
- Luminance sweep
- Y,C_B and C_R sweep
- Multipulse

- 15% window
- 20% window
- 100% window
- Flat field 100%
- black
- Check field
- Timing test
- Field delay test
- Bow-Tie
- Digital/Analogue blanking markers
- Digital grey
- Field squarewave
- Alternating black/white, 0.1 Hz
- End-of-line pulses
- End-of-line porches (ITU801):
  - White
  - Blue
  - Red
  - Yellow
  - Cyan
- Shallow ramp
- Luminance ramp (black to white)
- Limit ramp
- Valid ramp
- Staircase, 5 steps
- Modulated staircase, 5 steps
- Staircase, 10 steps
- Pulse and bar
- Yellow/grey ramp
- Grey/blue ramp
- Cyan/grey ramp
- Grey/red ramp
- C_B,Y and C_R, Y ramp
- Crosshatch
- PLUGE
- Safe area
- CCIR18
- CCIR17
- CCIR330
- CCIR331
- VMT01 test pattern (only 625 lines)
- Philips test pattern:
  - 625 lines in 4:3 aspect ratio
  - 625 lines in 16:9 aspect ratio
  - 525 lines in 4:3 aspect ratio
  - 525 lines in 16:9 aspect ratio
- FuBK test pattern:
  - 625 lines in 4:3 aspect ratio
  - 625 lines in 16:9 aspect ratio

Note: The Philips test pattern can be configured in respect to:

- Moving bar ON/OFF
- 5/10 step staircase
- Anti-PAL ON/OFF
- PLUGE ON/OFF
- Corner circles ON/OFF (only 16:9)

Source Identification:

Standard signals:	Three strings with up to 16 characters can be added to the signal
Philips and FuBK Pattern:	Philips pattern Text in upper and lower text area. Time and date inserted in centre part of crosshatch lines

Output monitoring

Continuous of output level with error flag on “Change-over” connector. Detector can be disabled.

3.9.13 PT8635 Dual AES/EBU Audio Generator

Outputs:	2 x AES/EBU pairs
Sampling frequency:	48 KHz
Data rate:	3.072 MBit/s
Type of outputs (Configurable):	
	Silence, tone or word-clock
Linear coding:	PCM, 20 bit two's complement binary, bi-phase mark coding
Single ended outputs:	BNC, according to AES3 ID
Output Impedance:	75 $\Omega \pm 20\%$
Amplitude:	1.0 V $\pm$ 10%
Rise and fall time:	30-44 ns
Balanced outputs:	XLR, according to AES3 1992
Output Impedance:	110 $\Omega \pm 20\%$
Amplitude:	$3V_{pp}$ typical
Rise and fall time:	10-30 ns
Jitter:	$<$ 20 ns
Wordclock output:	Single ended, BNC
Output Impedance:	75 Ω
Amplitude:	2.5 V_{pp} in 75 Ω

Output signals:

- Stereo 800Hz, No click
- Stereo 1 kHz, No click
- Stereo EBU 1 kHz, Single click in Ch. A
- Stereo BBC 1 kHz, Single click in Ch.A and double click in Ch.B
- Mono EBU 1 kHz, Single click in both Ch. A and Ch. B
- Mono, No click
- Dual, 1kHz in Ch. A, 400 Hz in Ch. B, No Click
- 48 KHz reference

Output levels:	Silence, 0, -9, -12, -15, -16, -18, -20 dBFS
Preemphasis:	None

Audio reference word clock output:
48 KHz squarewave
Note: When the 110 Ω XLR output is used with the 48 kHz clock signal, it should be terminated by 110 Ω in order to obtain reliable transmission.

3.9.14 PT8637 Time Clock Interface

References for Time Clock:

- VITC in genlock signal
- LTC on separate XLR connector ("Time Code")

Programmable Time Offset:

- $\pm$ 10 sec

Priority of References:

1. VITC, LTC or 1 sec. pulse
2. External/internal video reference
3. Battery backed XTAL oscillator (only when power is off)

Input, VITC Code Data

Signal is conveyed on the Gen-lock input on the Gen-lock input

Standard:

PAL:	EBU Tech 3097E
NTSC:	ANSI/SMPTE 12M 1966

Amplitude:

PAL:	550 mV$\pm$ 5%
NTSC:	570 mV$\pm$ 5%

Bit rate:

PAL:	1812.5 $\pm$ 0.2 kb/s
NTSC:	1789.77 $\pm$ 0.2 kb/s

Position:

PAL:	Line 6-22
NTSC:	Line 10-20

User bits are ignored.

Input, Time Code Input

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

LTC code:

Input impedance:	$>$ 10 Kohm
Input level:	0.8-5 V_{pp}
Data format:	User bits are ignored

Second's pulse input

Input impedance:	1 K Ω $\pm$10% (50 Ω by internal jumper setting
Input level:	1.8-2.2 V_{pp}
Pulse duration:	18 μs- 0.4s

3.9.15 PT8639 SDI Black and Colourbar Module

Connectors:	2 x BNC
Format:	270 Mb/s component Complies with ITU-R BT 656 and SMPTE 259M
Data format:	Scrambled NRZI 270 Mbit/sec
Output impedance:	75 Ω
Return loss:	> 15 dB, 5 to 270 MHz
Amplitude:	800 mV ± 10%
Jitter:	< 0.2 UI (one UI equals 3.7 ns)
Timing range:	525/60: ± 1 field 625/50: ± 1 field
Resolution:	37.5 ns (one half clock cycle on the 13.5 MHz clock)
Ancillary data:	
EDH:	ON/OFF
Embedded audio:	Position: audio group1, channels 1-4
Output signals:	Off, Silence and 1 kHz
Output levels:	0, -9, -15, -18 dBFS

Output Signal:

- Colourbars
- **525-lines:**
  - SMPTE bar
  - FCC
  - 75% Colourbar, ITU 801 (timing and levels acc. to ITU801)
  - 100% bar
  - Red 75%

  625-lines:
  - EBU bar
  - 75% Colourbar, ITU 801 (timing and levels acc. to ITU801)
  - 100% bar
  - 75% bar with red
  - Red, 75%
- Multiburst in Y,CR and CB
- 15% window
- 20% window
- 100% window
- Black
- Check field
- Digital grey
- Staircase, 5 step
- Crosshatch
- PLUGE

Source identification

None

Output monitoring

Continuous of output level with error flag on “Change-over” connector. Detector can be disabled.

3.9.16 PT8643 Ethernet Option

The PT8643 is equipped with a IEEE 802.3 10 BASE-T Ethernet network connection. The Ethernet connection is fully compatible with 100/1000 BASE-T for both full and half duplex with auto-negotiation and automatic polarity detection and correction.

Connectors:
1 x RJ45
1 x Female 9 Pin D-SUB
1 x Male 9 Pin D-SUB

- **IPv4**
- **Ethernet protocols:**
  - DHCP Client.
    Provides automatic configuration of IP address if a DHCP server is available in the network.
  - Telnet Server.
    Provides remote control of the PT5300 over the network.
    Default Port: 23 (TCP)
  - SNTP Server. (Requires an optional PT8646 GPS Genlock module.)
    Simple Network Time protocol version 4. (Unicast)
    Port: 123 (UDP)
  - NetFinder.
    Provides easy configuration of the PT8643 module.
    Port: 3040 (UDP)
- **RS232 Remote control.**
- **Changeover control.**

3.9.17 Level detectors

All generator outputs have built-in level detectors:

Analogue Video Signals:

Alarm limits $<$ -3dB or $>$ +7dB

SDI:

Measures both current and voltage. When one of either is more than 2dB down, the alarm is set.

AES/EBU:

Alarm limits for BNC outputs: $<$ 0.75V or $>$ 2.7V Alarm limits for balanced outputs: $<$ 2.4V or $>$ 10V Alarm limit for Wordclock: $<$ 1.25V

Response time for detection:

Approx. 2ms.

3.10 Mechanical and Environmental Specification

3.10.1 Climate Conditions

Ambient temperature: 5°C to 45°C (41°F to 113°F)

Limit range of Storage and Transportation: -20°C to 60°C (-4°F to 140°F)

Humidity: Non condensing (IEC 721)

3.10.2 Mechanical Requirements

Vibration:

Limit range for storage and transport: 30 min. in each of three directions, 10 to 150 Hz; 0.7 mmp-p and 50 m/s^2 max acceleration. According to IEC-Publ. 68, test Fc.

Note: Unit mounted on vibration table without shock absorbing material.

Bump:

Limit range for storage and transport: 1000 bumps of 100 m/s^2 sine, 6 ms duration in each of 3 directions. According to IEC-Publ. 68, test Eb.

3.10.3 Safety

IEC1010-1

3.10.4 Electromagnetic Compatibility:

- Complying with EN 50081-1/1994 (emissions) and EN 50082-1/1992 (immunity)
- Complying with FCC Rules & Regulations, Part 15, Subpart J, Level B (emissions)

3.11 Power Supply

Voltage:	90 - 250 VAC
Frequency:	48 - 65 Hz
Power consumption:	Maximum 90 VA with all options included

3.12 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)

4 Accessories and Options

4.1 Accesories

Item:	Quantity:	Ordering Number:
Mains cable, EURO	as required	4008 105 00200
Mains cable, US	as required	4008 105 00030
Mains cable, UK	as required	4008 105 01390
Rubber foot self adhesive	4	2822 030 90299

4.2 Options

Description:		Ordering Number:
PT8603	SDI Test Signal Generator	9449 086 03001
PT8604	Multiple Parallel Black Burst, 6 Outputs	9449 086 04001
PT8606	SDI Digital Genlock	9449 086 06001
PT8608	Dual Black Burst Generator	9449 086 08001
PT8609	SDI Black & Colour Bar Generator	9449 086 09001
PT8611	Tri-Level HDTV Sync. Generator	9449 086 11001
PT8612	HD-SD SDI test signal Generator	9449 086 12001
PT8613	Dual link HD-SD Test Signal Generator	9449 086 13001
PT8616	GPS Genlock and LTC Generator	9449 086 16001
PT8631	Analogue Test Pattern Generator	9449 086 31001
PT8632	SDI Test Pattern Generator, Extended	9449 086 32001
PT8632/10	SDI Test Pattern Generator, Extended with FuBK pattern instead of Philips	9449 086 32011
PT8633	SDI test Pattern generator, High end	9449 086 33001
PT8635	Dual AES/EBU Audio Generator	9449 086 35001
PT8637	Time Clock Interface	9449 086 37001
PT8639	SDI Test Signal Generator, Basic	9449 086 39001
PT8643	Ethernet option with support for SNTP	9449 086 43001
PM8552	Rack Mounting Kit	9449 085 52001
Service Manual		9499 491 10121

5 Installation

5.1 Initial Inspection

Check the contents of the shipment for completeness and possible transport damage. If the contents are incomplete or damaged, a claim should be filed with the carrier immediately and the DK-Technologies A/S Sales or Service organization should be notified in order to facilitate the repair or replacement of the instrument.

5.2 Safety Instruction

5.2.1 Earthing

Before any other connection is made, the instrument must be connected to a protective earth conductor in one of the following ways:

- Via the three-core mains cable
- Via the protective earth terminal marked ⏚

Before connecting the equipment to the mains of the building installation, the proper functioning of the protective earth lead of the building installation needs to be verified.

WARNING: Any interruption of the protective conductor inside or outside the instrument, or disconnection of the protective earth terminal, is likely to make the instrument dangerous. Intentional interruption is prohibited.

5.2.2 Mains Voltage Cord and Fuses

Different power cords are available for the various voltage outlets.

Note: If the mains plug has to be adapted to the local situation it should only be done by a qualified person.

This instrument is equipped with a tap-less switch mode power supply that covers most nominal voltage ranges in use: 90-240V AC RMS. This obviates the need to adapt to the local mains voltage.

The mains frequency is 48-65 Hz.

WARNING: This instrument shall be disconnected from all voltage sources when renewing a fuse.

Mains fuse rating: 1.6 A delayed action, 250 V

The mains fuse holder is located on the rear panel of the instrument.

If the mains fuse has to be replaced please proceed as follows:

1. Remove the mains cable
2. Lift the plastic cover (fuse holder) by means of 2 small screwdrivers (simultaneously)
3. Insert the new fuse into the top of the fuse holder
4. Re-insert the cover (fuse holder)

WARNING: Make sure that only fuses of the required rating, voltage, and of the specified type are used for replacement.
The use of repaired (jumped) fuses and/or the short-circuiting of the fuse holder is prohibited.
Fuses must only be replaced by a qualified person who is aware of the hazards involved.

5.3 Rack Mounting

This instrument is delivered in a 19" cabinet. Four self adhesive rubber feet are supplied together with this instrument

If several cabinets are mounted in a 19" rack, special attention must be paid to the temperature inside the rack.

The PT5300 is equipped with cooling fan and air inlet on the front, bottom and at the sides. If the PT5300 is mounted between other instruments with high surface temperature, this cooling may not be sufficient. Under these circumstances, it is recommended to make space between the instruments, and to establish forced circulation (cooling) in the rack.

5.4 Installation of Rack Mounting Kit, PM 8552

The rack slides mount in any rack with a front-to-rear spacing between 18 and 27 inches. Reserve clearance between the rear panel of the instrument and the cabinet panel for connectors and to provide necessary air circulation.

Mounting of Slide Tracks

1. Mount the chassis section of the rack slide kit to the instrument with the snap latch at the rear. Make sure that the screws are secured.
2. Mount the rails using the hardware shown in the figure. Align the stationary sections both horizontally and in level.

Installing of the Instrument

1. Pull the slide-out section to the fully extended position.
2. Insert the instrument chassis section into the slide-out sections.
3. Press the snap latches and push the instrument towards the rack frame until the latches snap into their holes.
4. Press the stop latches again and push the instrument totally into the rack.
5. Fix the instrument by means of the front panel screws.

After installation, the slide tracks might need to be slightly adjusted to ensure smooth operation. To do so, pull the instrument halfway out, slightly loosen the screws holding the tracks to the front rail, and allow the tracks to settle to an unbound position. Tighten the screws and by pulling the instrument in and out several times ensure smooth operation.

Removal of the Instrument

Be sure that all cabling is disconnected before removing the instrument.

1. Loosen the screws in the rack frame and pull the instrument forward until the stop latches snap into their holes.
2. Press the stop latches and remove the instrument.

5.5 Cleaning

- Disconnect the instrument from the mains voltage supply before cleaning
- Use only a damp cloth
- Make sure that no liquid is spilled inside the instrument

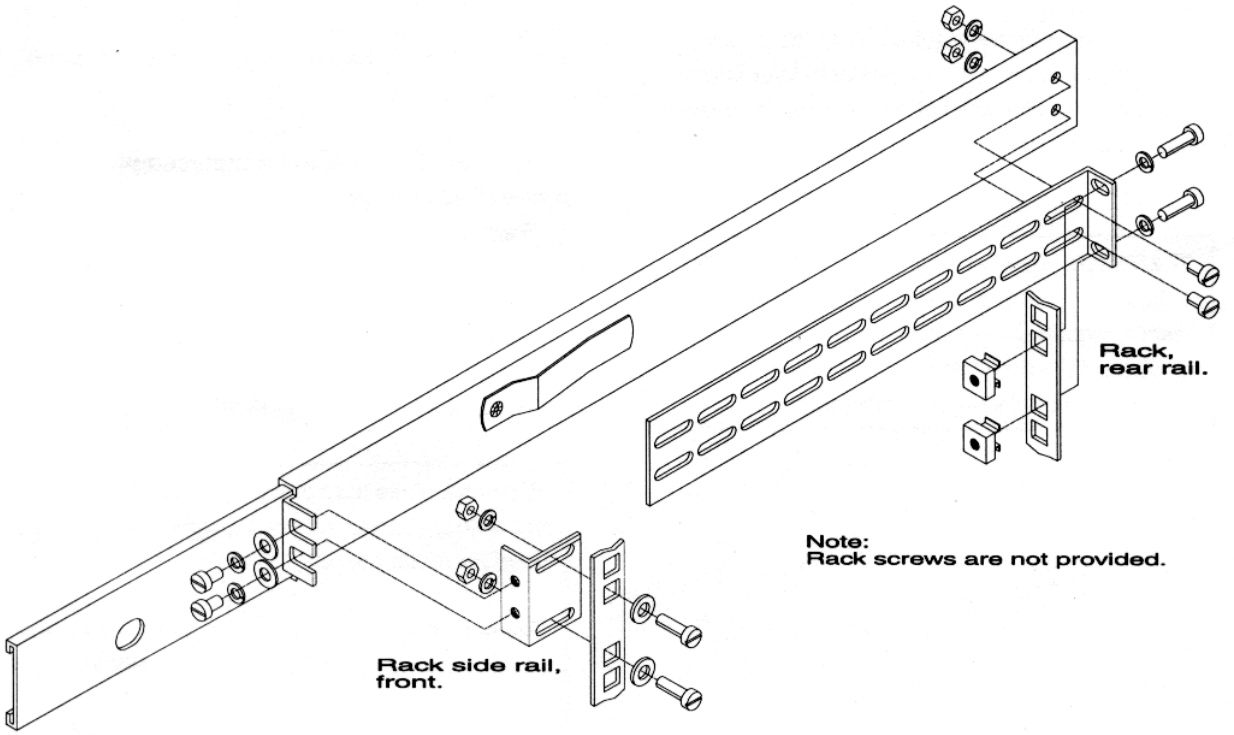

Figure 1: Installation of PM 8552

5.6 Access to and Replacement of Parts

5.6.1 Safety

The opening of covers or removal of parts, expect those to which access can be gained by hand, is liable to expose live parts.

The instrument must be disconnected from all voltage sources before performing any adjustment, replacement, maintenance, or repair, which requires the instrument to be opened. If repair of the opened instrument is unavoidable, it must only be carried out by a skilled person who is aware of the hazards involved. To guarantee safety only original spare parts must be used.

5.6.2 Access to the Units

To gain access to the units, remove the screws that secure the top cover of the instrument and lift the cover up.

5.6.3 Installation of Options

The installation instruction is supplied with the option.

5.7 GPS Antenna and cable connection

The PT8616 option is delivered with an active antenna and 12 meters of cable selected for the unit. Some customers however may want to use their own antenna or run longer cables. This section explains what to look out for.

Antenna requirements and specifications.
The application always requires an active antenna, running 3.3 volts. There are two types of active antennas, which may be considered. Helix or Patch. The difference are the physical design and the area of the sky which is covered. A Helix antenna has a physical shape of a pole and covers the widest area of the sky. It also has to be physically bigger, to pick up RF signals, compared to the Patch antenna. The Patch antenna can be smaller but does not cover the sky just as well as the Helix antenna. The Helix antenna may be preferred on buildings, because of the slightly better performance, but the Patch antenna suits most needs and also fits well on OB vans, roofs etc.

Different antennas have different gains which will permit different cable lengths. The typical gain level is about +30 dB. An active antenna draws current in the region of 5 - 20 mA. It is important not to draw more current than 50 mA to avoid damaging the GPS circuit. In the case of short circuit the GPS receiver shuts down the supply voltage.

Cable loss budget.
It is very important the cable loss is considered carefully when using custom cables longer than the 12 meter RG58 cable supplied. The GPS RF frequency is 1575 MHz, so all further loss calculations will be at this specific frequency.

The GPS receiver requires a minimum signal strength of -140 dBm to lock to a satellite. The GPS satellites are specified to deliver signals strengths between -123 dBm and -130 dBm at the earth surface. With a typical antenna gain of 30 dB, the power level out of the antenna is in the range of -97 dBm. This allows a maximum loss of 43 dB in the cable, before the locking threshold of -140 dBm is reached. It is advisable to keep a margin of about 5 dB from the locking threshold. Clouds, snow and rain will degrade the performance. Below are some examples of cable losses:

Cable type	Loss/100 m @ 1.5 GHz	Max lenght, 35 dB loss
RG58	110 dB*	31 m
RG213	44 dB*	75 m
CDF400	17.8 dB	195 m

**) Note: The RG58 and RG213 are found in various low-loss versions. See datasheet for specific cable used.*

Table 4: Cable types.

Antenna and cable installation and usage.
The placement of the antenna is important for the overall performance. The antenna must not be obstructed in any way. This obstruction could be caused by trees, roofs etc. What may seem less obvious is tall walls near the antenna which may decrease the performance. This is because the RF-signal may reflect of the wall and the antenna could receive both the direct and reflected signals which may confuse the receiver circuit. Always install the antenna where there is a clear sky-view.

Please note it is important the cable is connected to both the antenna and the PT5300 antenna input, before the unit is powered up. The GPS receiver calculates the noise floor on power-up and the connection with the antenna has to be established at this moment.

On power up, check that the text "GPS: none" on the front display changes to "GPS: ok" after a short time. This will confirm the connection works correctly. The final step is to seal the connection to prevent corrosion, when exposed to humidity.

Electrical requirements.
Antenna.

Antenna voltage:	3.3 Volts
Antenna maximum power consumption:	50 mA
Antenna minimum gain:	15 dB
Antenna maximum gain:	50 dB
Antenna maximum noise figure:	1.5 dB

Receiver.

Receiver input level:	-140 dBm $<$ *input* $<$ -5 dBm
Receiver input RF frequency:	1575.42 MHz

6 Operating Instructions

6.1 General Information

All operational controls and configurations are conveniently carried out from the front panel.

The two-line-by-40-characters LCD display, in conjunction with 4 cursor keys and an E button, allows easy and intuitive operation of the PT5300 HD-SD Varitime™ Sync Generator.

The cursor keys are used to call relevant menus on the display: the top line of the display shows the current status/selection or other current menu choices.

In the upper right corner of the display is an indication of cursor keys used in the active menu.

- a ▸ indicate that the right arrow buttons can be used
- a ▴ indicates that the up button can be used
- a ▾ indicates that the down button can be used
- a ◂ indicate that the left arrow buttons can be used
- and an E indicates that the E button can be used

The bottom line of the display indicates new selections or enables changes to parameter setting.

6.2 Front Panel Controls

6.2.1 Navigation Key

The circular key in the middle of the front panel is the so-called Navigation key or Compass key is the tool for making the navigation through the menus light and easy.

Note: The function of some of the output/input connectors on the rear panel depends upon the functional modules/options included your generator and the functional configuration.

Figure 2: PT5300 Navigation Keys

The black key in the middle is the E

The ▴ (upper) button allows the user to exit the current menu and enter a higher-level menu, or to change parameter.

The ▾ (lower) button allows the user to select new menus or sub-menus, or to change parameters.

The ◂ and ▸ (left and right) keys are used to scroll horizontally in the menus and to select the individual characters when naming presets an written text into the video full field test signals.

PRESET

The **PRESET** button provides fast access to the instrument presets when switching between different standard applications.

OUTPUT

The **OUTPUT** button provides a fast access to output signal selection on the generators.

GENLOCK

The **GENLOCK** button provides a fast switching between locked and unlocked mode. The green LED next to the button indicates that **GENLOCK** has been selected. The type of genlock is selected via the menu.

6.3 Indicators and Connections

6.3.1 Front Panel Indicators

POWER ON

A green LED that indicates when DC power is available from the internal DC supply.

WARNING

A red LED indicates that the instrument has detected an irregularity. A more thorough description is given in the display. More errors if any can be found in the error log function.

UNLOCKED

A red LED that indicates when genlock mode is enabled but no correct genlock signal is found on the active genlock input. In this case, the generator switches automatically to internal mode until a valid genlock signal becomes available.

Note: The function of some of the output/input connectors on the rear panel depends upon the functional modules/options included your generator and the functional configuration.

Figure 3: Front panel

6.4 Display Information

To guide the user through operations, symbols of the push buttons, which can be activated at a particular time will appear on the right side of the display.

▲▼◀ ▶	Indicates which of the buttons in the Navigation are active
E	Indicates that the E button (the black in the middle) must be pressed to activate the required selection
<>	Indicates the position of the cursor on the menu line
[ ]	Indicates that changes to individual characters or digits are possible in timing and naming menus
. . .	Indicates that more items are available on the menu line
🔒	Indicates that the panel is locked. Four different locked modes are available. The padlock will be only visible when the "performed" function is locked
ESC	To abandon changes, place the cursor on ESC and press also ▲
SAVE	To save a changed parameter, place the cursor on SAVE and press the E button

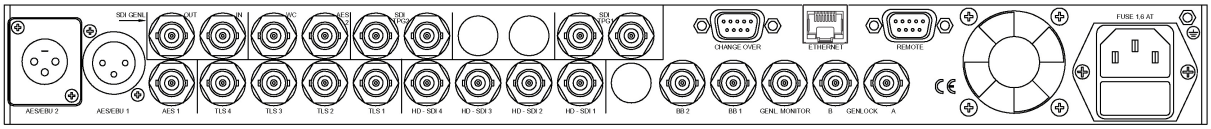

Figure 4: Rear panel

6.5 Rear Panel Connections

Note: The function of some of the output/input connectors on the rear panel depends upon the functional modules/options included your generator and the functional configuration.

Safety Ground (chassis)

Mains voltage receptacle.

REMOTE
Connector for remote control of the PT5300. The remote connector is configured as standard RS232, please see section 7 for detailed information about the RS232 interface.

ETHERNET
Ethernet network interface. The Ethernet interface provides support for remote control through Telnet and an optional SNTP Time Server.

The green LED in the Ethernet connector lights up when a Ethernet link is detected. The yellow LED lights up as a result of network trafic.

CHANGEOVER

Remote connector to connect the PT5300 HD-SD Varitime™ Sync Generator directly to a PT 5211 VariTime™ Sync Changeover Unit. This connector is used in set-up where a HD-SD Varitime™ Sync Generator is applied as back-up for a PT5300 HD-SD Varitime™ Sync Generator and an automatic changeover unit.

ANALOGUE GENLOCK A/B

Two analogue genlock inputs included as standard. The inputs can be configured either as looped through or 75 Ω terminated.

GENLOCK MONITOR

Buffered 75 Ω output of the selected genlock signal. The signal is AC-coupled.

BB1 and BB2

Two standard included outputs with Black Burst signals.

HD-SDI1 - HD-SDI2 - HD-SDI3 - HD-SDI4

Output Options:
Not included
Quad HD Tri-Level output
Quad HD-SD-SDI test signal out
Dual Link test output
One pair of SDI Basic Test Signals
One pair of SDI Test Pattern
One Pair of Analogue Test Patter

SDI-TPG1

Output Options:
Not included
One pair of SDI Test Pattern outputs

TLS1- TLS 2- TLS3- TLS4

Output Options:
Not included
Quad HD Tri-Level output
Quad HD-SD-SDI test signal out
Dual Link test output
One pair of SDI Basic Test Signals
One pair of SDI Test Pattern
One Pair of Analogue Test Pattern

AES/EBU2

Output Options:
Not included
AES/EBU digital audio test signal
Time code Input. (see (TIMECODE))

SDI GENLOCK IN/OUT

Output Options:
Not included
Active loop-through SDI genlock input
Special Configuration: AES/EBU and Word-clock

AES2

Output Options:
Not included
AES/EBU digital audio test signal output

WC

Not included
Wordclock, 48KHz, output

(TIME CODE)

Input Options:
Not included
Time Code The time code signal is used as reference for the PT 8637 Time Clock Interface LTC Pin 1: Ground Pin2: Signal Pin3: Signal 1 Hz Pin 1: Ground Pin2: Connect externally to pin 1 Pin 3: Signal

GPS Genlock and LTC Generator

Input / Output Options:
Not included
GPS active amp input
LTC time code output

Note: The SPG's, the TSG's and TPG's can in principle be placed arbitrarily, but for correct correspondence between numbering in the display and on the rear plate, certain rules have to be followed.

The table 5 and figure 6 show the possible combinations of Video Generators which can be installed

Note: In most cases the output, HD-SDI 1, HD-SDI 2, HD-SDI 3, HD-SDI 4, have to be used before any of the outputs other outputs. In the TPG 1, out the PT8603 and PT8632 SDI Test Pattern Generators can be installed independently of the other generators, but not both at the same time.

Note: The function of some of the output/input connectors on the rear panel depends upon the functional modules/options included your generator and the functional configuration.

6.6 Panel Operation

The PT5300 HD-SD Varitime™ Sync Generator may be equipped with several different optional modules. The menu system always reflects the modules installed. The operation of each of the modules is described below, although it is impossible for all the modules to be installed in one instrument at one time.

6.6.1 Power Up

A diagnostic routine is performed at power-on. After a normal start-up, the HD-SD Varitime™ Sync Generator continues to the status display. If a failure is detected an error message is displayed.

Normal Start-up

```
HD-SD Sync.  Gen.Power-up diagnose
Selftest in progress ...
```

This message is shown while the test is performed.

After a successful test the following message is shown:

```
HD-SD Sync.  Gen.  Frame
Version:  07.-03.0
```

The instrument stops if errors are detected. The diagnose may be continued if you press the ▲ , ▼ , ◀ , ▶ or E . When the power-up diagnose program is finished, the instrument may be used, but excluding the erroneous function(s).

6.6.2 Status Displays

If a preset was active at the previous power-down, this preset is automatically recalled and the preset status display is shown. The preset status display shows the number and name of the active preset.

```
HD-SD Preset Status ◀▼▶
PRESET (6):name of preset
```

If genlock is activated in the preset and no genlock signal is identified, the status display will change to the genlock status display indicating UNLOCKED.

If no preset is active then genlock status display will be displayed.

Use the ◀ and ▶ buttons to select the status displays you want.

Note: The status displays for the various options are only available when the options are installed.

Status:Preset

```
HD-SD Preset Status ◀▼▶
NO PRESET ACTIVE
```

```
HD-SD Preset Status ◀▼▶
PRESET (1):name of preset
```

Status: Genlock

```
Genlock:A ◀▼▶
Signal:PAL Burst Status:  GENLOCKED
```

```
Genlock:Internal ◀▼▶
Signal:-----Status:-----
```

The genlock status display shows the input selected for genlock and the format of genlock selected. If the signal is NTSC or PAL the display will also indicate whether sync lock or burst lock is being used.

Status: Analogue test pattern generator

```
Analog TPG1:PLUGE ◀▼▶
System:PAL w/PAL ID +TEXT
```

The status display for the analogue test pattern generator shows the signal output from each the generator and the system selected. If the text or time clock is inserted into the test pattern, then the presence is shown.

Status: SDI test pattern generator

```
SDI-TPG1:PLUGE ◀▼▶
System:525/59.94.+TEXT +AUDIO +EDH
```

```
SDI-TSG3:WINDOW 15% ◀▼▶
System:525/59.94.  +AUDIO +EDH
```

The status display for serial digital test pattern generator shows the signal output from each generator and the system selected. Also the status for text (and clock), embedded audio, and EDH inserted into test signals/pattern is shown.

Status: SDI Basic generator

The serial digital test signal generator status display shows the signal output from each of the Basic SDI generators and the system selected. Also the status for embedded audio and EDH is shown. No text or clock can be inserted.

Status: AES/EBU Audio Generator

```
AES/EBU1:Stereo EBU 1kHz ◀▼▶
Level:-9dBFS Timing:PAL
```

The status display for the AES/EBU digital audio generator shows the output signal and level of the audio. The five NTSC phases or the PAL timing phase is also displayed.

Status: DATE-TIME

```
DATE:05-02-02 TIME:14:05:05 ??  ◀▼▶
REF: VITC Code STATUS: LOCKED
```

This display shows the current status of date and time i.e. the information inserted into the video signal.

Status: WARNING

```
HD-SD Error/Warning Status:??  ◀▼▶
No error detected
```

```
HD-SD Error/Warning Status:??  ◀▼▶
No active warning
```

```
HD-SD Error/Warning Status:??  ◀▼▶
E(00n):mmmmmmmmmm
```

The display shows the error/warnings status. The "No error detector" shows that no errors has been detected. The "No active warning" shows that no errors are present, but previously detected errors are stored in the "Errorqueue". In case of an error condition, the error number is shown in the display.

6.6.3 Menu Operation

Pressing the ▼ button in the status menu will cause the main menu to appear. This is the main route of access to all functions. If the control panel is locked, the padlock symbol will be flashing. Depending on which type of lock is used, it may have to be removed before some operations are allowed.

To exit the STATUS menu, press the ▼ button and move to the main menu:

```
HD-SD Sync Generator ◀▲▶
<BLACK-BURST> TRI-LEVEL HD-SDI ...
```

```
HD-SD Sync Generator ◀▲▶
<DL-SDI> ANALOG SDI-TSG4 ...
```

Note: Not all of the above options can be installed at a time; maximum 2 HD-SD SDI boards and/or up to 3 TRI-LEVEL-SYNC and/or up 4 TSG's and/or up to 3 TPG's can be mounted at a time. For the possible

```
HD-SD Sync Generator ◖◆◗
<SDI-TPG1> SDI-TPG2 SDI-TPG5 ...
```

```
HD-SD Sync Generator ◖◆◗
<SDI-TPG2> AES-EBU <GENLOCK> ...
```

```
HD-SD Sync Generator ◖◆◗
LTC PRESET <CONFIG> ...
```

combinations, refer to figure 6. If one or more of the options is not installed, the keyword will be missing in the menu.

Select one of the menus and go on to the next menu, e.g.:

```
MENU:BLACK-BURST, configure ◖◆◗
SUBMNU:<BB1> BB2
```

The menus have basically the same structure and the same procedure is used with all the menus. Select one of the items in the menu displayed

- Make a selection in the next menu below
- Use the arrow buttons as indicated in the icon field
- Select SAVE and press E to store the setting Select ESC and press ▲ button to escape the menu or
- Select the next menu level, i.e. 2NDMNU or
- Confirm the selection by pressing E

Note: SAVE does not appear until a parameter is changed. Unintended changes are canceled by selecting ESC and returning to the level above.

6.7 Detailed Description of Menus

6.7.1 Menu: BLACK-BURST generator

This is the menu for setting the parameters for the analogue Black Burst outputs. The analogue Black Burst outputs are named BB1 and BB2 connector on the back of the instrument.

Setting of the BLACK-BURST generator:

```
MENU:BLACK-BURST, configure ◖◆◗
SUBMNU:<BB1>BB2
```

- Use the ◖ and ◗ buttons to select BB1
- Then press ▼ to enter the submenu for BB1

```
SUBMNU:BLACK-BURST/BB1,select ◖◆◗
2NDMNU:<SYSTEM> TIMING ScH-PHASE
```

The 2NDMNU allows changes to be made in the parameters for the BB1 output.

To change form NTSC to PAL, select SYSTEM

Operation:

```
2NDMNU:../BB1/SYSTEM, select ◂▴▸
SYSTEM:<PAL w/PAL ID> SAVE ESC
```

- Use the ▴ and ▾ buttons to find the system setting you want.
- When the desired system appears in the display, move the cursor to SAVE and press E to change the system setting
- If no change is desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the BLACK-BURST/BB1 submenu.

Analogue Black Burst generator system options:

- NTSC
- PAL
- PAL w/PAL ID

Note: If the PAL Field 1 pulse in Line 7 is inserted, it is independent of the Sc-H phase setting. If the Sc-H phase has been adjusted, the Line 7 pulse will identify the field as if the phase had not been changed from the nominal setting. When the system "PAL w/PAL ID" is selected, a pulse indicating PAL Field 1 is included Line 7.

Note: When changing the system from PAL to NTSC you must check the timing adjustment: a valid PAL timing may NOT be valid in NTSC. If the timing is not valid in NTSC then it will be reset to +0,+0,+0.

To change the delay/advance timing for the BB1 output, select TIME.

```
2NDMNU:../BB1/TIMING, edit delay ◂▴▸
V:<+1> H:+008 T: +00124.3 SAVE ESC
```

Operation:

- Use the ◂ or ▸ buttons to select V, H, or T
- Then use the ▴ and ▾ buttons to change the setting changes to the timing are instantaneous, i.e. any changes are reflected immediately in the output signal
- When the desired setting appears in the display, move the cursor to SAVE and press E to change the setting

The timing can be adjusted by coarse or fine adjustment parameters. The coarsest adjustment is field (V) the finest is time (T), and line (H) is in between. The T value is in nanoseconds.

- The T value can be changed by using the ▴ and ▾ buttons to adjust the smallest step for the adjustment, but a faster method is to press E when the cursor is on the T value. This opens an editor in which each of the time digits can be changed using the ▴ and ▾ buttons
- Positions are Selected by using the ◂ and ▸ buttons
- To exit the editor press E
- When the desired delay setting appears in the display, move the cursor to SAVE and press E
- If no changes are desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the BLACK-BURST/BB1 submenu.

To change the Sc-H phase of the BB1 output, select ScH-PHASE

The default Sc-H phase for the BB outputs is 0 degrees. The value can be changed in steps of 1 degree.

Operation:

```
2NDMNU:../BB1/SCH-PHASE, EDIT ◂▴▸
ScH-PHASE:<+5deg> SAVE ESC
```

1. Use the ▴ and ▾ buttons to change the Sc-H phase. Change to the Sc-H phase is instant, i.e. any change made in the display is reflected immediately in the output signal
2. When the desired setting appears in the display, move the cursor to SAVE and press
3. EXECUTE
4. If no change is desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the BLACK-BURST/BB1 submenu.

6.7.2 Menu: TRI-LEVEL sync generator

This is the menu for setting the parameters for the analogue TRI-LEVEL SYNC outputs.

The analogue TRI-LEVEL outputs are named TLS1, TLS2, TLS3, TLS4 when the units is mounted in the primary position and TLS5, TLS6, TLS7, TLS8 when the units is mounted in the additional / alternate position as mentioned in the table 6-1 on page 6-30

Setting of the TRI-LEVEL SYNC generator:

```
MENU:TRI-LEVEL, configure ◂▴▸
SUBMNU:<TLS1> TLS2 TLS3 TLS4
```

- Use the ◂ and ▸ buttons to select TLS1
- Then press ▾ to enter the submenu for TLS1

```
SUBMNU:TRI-LEVEL/TLS1,select ◂▴▸
2NDMNU:<SYSTEM> TIMING
```

The 2NDMNU allows changes to be made in the parameters for the TLS1 output.

To change from one HD TRI-LEVEL format to another, select FORMAT

```
2NDMNU:../TLS1/SYSTEM, select ◂▴▸
SYSTEM:<HD 1080I/25> SAVE ESC
```

Operation:

- Use the ▴ and ▾ buttons to find the format setting you want.
- When the desired system appears in the display, move the cursor to SAVE and press E to change the format setting

```
2NDMNU:../TLS1/SYTEM, select ◂ ▸E
SYSTEM:HD 1080I/25 <SAVE> ESC
```

- If no change is desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the TRI-LEVEL/TLS1 submenu.

Analogue TRI-LEVEL SYNC generator system options:

- 1080p/60
- 1080p/59.94
- 1080p/50
- 1080p/30
- 1080p/29.97
- 1080p/25
- 1080p/24
- 1080p/23.96
- 1080i/30
- 1080i/29.97
- 1080i/25
- 720p/60
- 720p/59.94
- 720p/50
- 720p/30
- 720p/29.97
- 720p/25
- 720p/24
- 720p/23.9

Note: When changing from one format to the other you must check the timing adjustment, as the timing in one format may NOT be valid in a different format. If the timing is not valid then it will be reset to +0,+0,+0.

To change the delay/advance timing for the TLS1 output, select TIMING.

```
2NDMNU:../TLS1/TIMING, edit delay ◂▴▸E
F:<+1> H:+008 T: +00006.7 SAVE ESC
```

Operation:

- Use the ◂ or ▸ buttons to select F, H, or T
- Then use the ▴ and ▾ buttons to change the setting. Changes to the timing are instantaneous, i.e. any changes are reflected immediately in the output signal.
- When the desired setting appears in the display, move the cursor to `SAVE` and press `E` to change the setting.

The timing can be adjusted by coarse or fine adjustment parameters. The coarsest adjustment is field (F) the finest is time (T), and line (H) is lines. The T value is in nanoseconds.

- The T value can be changed by using the ▴ and ▾ buttons to adjust the smallest step for the adjustment, but a faster method is to press `E` when the cursor is on the T value. This opens an editor in which each of the time digits can be changed using the ▴ and ▾ buttons.
- Positions are Selected by using the ◂ and ▸ buttons.
- To exit the editor press `E`
- When the desired delay setting appears in the display, move the cursor to `SAVE` and press `E`
- If no changes are desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the TRI-LEVEL/TLS1 submenu.

6.7.3 Menu: GENLOCK

This is the menu for setting the genlock parameters, which are the common reference for the individual timing of each generator.

It is always possible to genlock to analogue signals, while the PT 8606 SDI Digital Genlock option is necessary in order to genlock to digital video. The standard genlock inputs are designated A and B, and they can be either configured to signals terminated with 75 Ω or configured as a high impedance loop-through.

The genlock function can be configured to different inputs and signals. Which signals are valid for each of the inputs depends on the setting in the Genlock menu.

Select: GENLOCK

```
MENU : GENLOCK, select input ◖⇕◗
<INTERNAL> SYS TIMING ESC
```

```
MENU : GENLOCK, select input ◖⇕◗
<A PAL Burst> SYS TIMING OK ESC
```

Operation:

- When an input has been configured to a specific type of genlock, this will be shown in the genlock select input menu
- Use the ▲ and ▼ buttons to scroll through the different input options (with attached genlocked types)
- Then move the cursor to OK and press E button to change the selection (OK is only visible for other selections than the active)
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the GENLOCK menu.

The types of inputs available are:

- A xxxxxx: Input A terminated 75 Ω
- B xxxxxx: Input B terminated 75 Ω
- A-B xxxxxx: Input A and B looped through, high impedance
- Internal: The internal OCXO used as reference
- SDI xxxxx: The optional PT 8606 SDI Digital Genlock module used for genlock input

Included with the selection is a description of the signal type used for the genlock. The xxxxxx reflects the genlock system selected in the SYStem submenu. For instance "A-B PAL Burst" indicates that loop-through A-B is configured for PAL burst lock.

Note: The "UNLOCKED" LED is ON when no correct genlock signal is found on the active genlock input.

To change the genlock system for the input selected, select SYS in the GENLOCK menu.

```
SUBMNU:GENLOCK/SYSTEM, select ◖⇕◗
SYSTEM:<PAL Burst> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to select the system format of genlock for the input

- When the new format appears on the display, then move the cursor to SAVE and press E to change the signal format
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the GENLOCK menu.

Note: Now the selected genlock system (A, B, Loop-through, Internal, or SDI) is configured. If the input for this system has not been activated, select OK in the GENLOCK menu and press E

Which signals are available to the different genlock inputs depends upon the type of genlock edited.

Genlock signals available for A, B, and A-B:

- PAL Burst
- NTSC Burst
- 625 Sync
- 525 Sync
- 4.43 MHz
- 3.58 MHz
- 5 MHz
- 10 MHz

Genlock signals available for SDI/GPS:

- 525/59.94
- 626/50

Note: No Genlock system nor Timing can be selected when Genlock Input is set to Internal or one of the continuous wave signals.

To change the genlock timing for the input selected, select TIMING in the GENLOCK menu.

```
SUBMNU:GENLOCK/TIMING, edit delay ◀▲▶
V:<+0>H:+123 T:+00123.4 SAVE ESC
```

Operation:

- Use the ◀ and ▶ buttons to select V, H, or T
- Then use ▲ or ▼ buttons to select the value desired. Changes to the timing are instantaneous, i.e. any changes are reflected immediately in the output signal.

The timing can be adjusted by coarse or fine adjustment parameters. The coarsest adjustment is the Field (V), the finest is Time (T), and Line (H) is between. The T value is in nanoseconds. The timing resolution depends upon the type of signal used for genlock.

- When the desired delay setting appears in the display, move the cursor to SAVE and press E
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the GENLOCK menu

Note: The genlock timing can only be changed when the genlock type is a signal containing line and field information. It is not possible to change timing when the reference is 5/10 MHz, Subcarrier frequency or internal.

Note: When changing genlock signal format, for instance, from PAL to NTSC, the timing parameters may become invalid: The timing parameter will then be reset to 0 for the input in question.

```
MENU : GENLOCK, select input ◂▴▸
<INTERNAL> SYS TIMING ESC
```

```
MENU : GENLOCK, select input ◂▴▸
<GPS 625/50> SYS TIMING OK ESC
```

6.7.4 Menu: GPS Genlock and LTC output

This is the menu for setting the parameters for the GPS Genlock input and the LTC outputs.

Select: GENLOCK

Operation:

- When an input has been configured to a specific type of genlock, this will be shown in the genlock select input menu
- Use the ▴ and ▾ buttons to scroll through the different input options (with attached genlocked types)
- Then move the cursor to OK and press E button to change the selection (OK is only visible for other selections than the active)
- If no change is desired, move the cursor to ESC and press ▴ Leaving the function takes you back to the GENLOCK menu.

Leaving the function takes you back to the GENLOCK menu.

The LTC outputs are named LTC A and LTC B. LTC A and LTC B are output to both BNC connectors at the same time where on the XLR connector it is one at the time.

Settings of the LTC generator:

```
SUBMNU: LTC, select 13:55:09 ◂▴▸
LTC A <OFFSET> FORMAT TIME SYNC ESC
```

- Use the ▴ and ▾ buttons to switch between LTC A or B set-up, when marked as shown above. Notice, that switching between LTC A and B, only determines which generator to be setup, and does not yet alter the outputs.
- Select the parameter, you wish to change, then press ▾ to enter the parameter submenu for the selected LTC generator.

To set offset, select OFFSET:

```
2NDMNU: ../LTC A/OFFSET, edit delay ◂▴▸
OFFSET: <+0000100000.0>ns OK ESC
```

Each LTC generator can be individually timed, relative to absolute (GPS) time. The offset can be in the range of ±500 ms, in steps of 6.7 ns.

Operation:

- Use the ▴ and ▾ buttons to increase/decrease delay. Pressing OK will apply the delay.
- For faster adjustment, you can go into coarse mode. By pressing the E button, you can edit the individual digits. Select a digit by pressing 3 and 4, and edit the offset, by pressing ▴▾ . Notice, that the lowest digit cannot be selected. This is because the step-size is greater than what this digit represents.
- When done, move the cursor to OK and E or move to ESC and press ▴ to cancel.

```
2NDMNU: ../LTC A/FORMAT, select ◂▴▸
FORMAT: <25.00 FPS> SYNCMODE OK ESC
```

Leaving the function takes you back to the LTC submenu.

To change between formats, select FORMAT

Operation:

- Use the ▴ and ▾ buttons to find the system setting you want.
- When the desired system appears in the display, press OK to confirm. Otherwise move the cursor to ESC and press ▴ to cancel.

Leaving the function takes you back to the LTC submenu.

LTC options:

- 24 FPS
- 25 FPS
- 29.97 FPS Non-dropframe (in menu <29.97 NOND>)
- 29.97 FPS Dropframe
- 30 FPS

Note: When selecting 29.97 FPS modes, go to the main LTC menu, and select <SYNC> to reset the frame-counter.

To change how the 29.97 FPS LTC re-sync the frame-counter, select SYNCMODE

```
2NDMNU: ../LTC A/SYNCMODE, edit ◂▴▸
SYNCMODE:<AUTO> TIME: 00:00 OK ESC
```

When running at 29.97 FPS, the frame counter does not match real-time. One second at 29.97 FPS are a bit longer than a real-time second. Therefore, the LTC time lags behind realtime after a while. To prevent this, the LTC generator can re-sync the frame-counter. The LTC generator can do this in three modes: NONE, CONFIRM mode and AUTO mode. When NONE is selected, the frame-counter never resets (you can reset the frame counter manually from the LTC main menu). In CONFIRM mode, the PT5300 will ask for confirmation at the time specified in the SYNCMODE menu. In AUTO mode, the frame counter re-syncs automatically, at the time specified in the SYNCMODE menu.

Operation:

- Use the ◂ and ▸ buttons to select either mode, hours or minutes.
- Use the ▴ and ▾ buttons to find the mode you want.
- Use the ▴ and ▾ buttons to specify, at which time the re-sync shall occur.
- When the desired system appears in the display, press OK to confirm. Otherwise move the cursor to ESC and press ▴ to cancel.

Leaving the function takes you back to the LTC submenu.

To change time and date settings, select TIME

```
2NDMNU: ../LTC A/TIME, select ◂▴▸
2NDMNU: <TIMEZONE> DAYLIGHT ESC
```

In the TIME menu, the clock and date can be setup, as well as daylight saving parameters.

Operation:

- Use the ◂ and ▸ buttons to select the time setting you want alter, then press ▾
- TIMEZONE and DAYLIGHT will open a new menu.

Leaving the function takes you back to the LTC submenu.

To change time zone, select TIMEZONE

```
2NDMNU: ../LTC A/TIMEZONE, edit ◂▴▸
TIMEZONE: +01:00 OK ESC
```

In the TIMEZONE menu, you can set the time zone, by offsetting the UTC time in steps of 30 minutes.

Operation:

- Use the ◂ and ▸ buttons to select either hours or minutes.
- Use the ▴ and ▾ buttons to set the desired offset.
- When the desired UTC offset appears in the display, move the cursor to OK and press E

Leaving the function takes you back to the TIME submenu.

To change daylight saving options, select DAYLIGHT

```
2NDMNU: ../LTC A/DAYLIGHT, select ◂▴▸
MODE:<AUTO>DST: on START END OK ESC
```

In the DAYLIGHT menu, the daylight saving settings are made. There are three different modes, to choose from. AUTO mode switches to, and back from daylight saving time automatically. This means the time advances one hour, at the chosen start date, and resets at the end date. The PT5300 will notice you of this change. In CONFIRM mode, the PT5300 does NOT change the time automatically, but will instead notice you and wait for confirmation to switch time. In OFF mode, no daylight saving changes will be made. You can also immediately change the state, by setting DST (daylight saving time) on or off in the menu.

Operation:

- Use the ◂ and ▸ buttons to select desired parameter.
- Use the ▴ and ▾ buttons to switch between modes, when marked.
- Use the ▴ and ▾ buttons to switch daylight saving on/off, when marked.
- Use the ▾ button on START or END, to setup daylight saving start and end date.
- Press E on OK to confirm settings

Leaving the function takes you back to the TIME submenu.

To change daylight savings start or end date, select START or END

```
3RDMNU:../LTC A/DAYLIGHT/START, edit ◂▴▸
START DATE:<03>29 HOUR: 02 OK ESC
```

You can set month, day and hour for when the switching should occur.

Operation:

- Use the ◂ and ▸ buttons to select month, day or hour.
- Use the ▴ and ▾ buttons to set the desired month/date/time.
- When the desired month/date/time appears in the display, move the cursor to OK and press E to store or press ▴ on ESC to cancel.

Leaving the function takes you back to the DAYLIGHT submenu.

6.7.5 Menu: NETWORK

This is the menu for setting the parameters for the PT8643 Ethernet module.

Ethernet settings:

```
SUBMNU: NETWORK, select ◂▾▸
<ETHERNET> CONFIG ESC
```

- Use the ◂ and ▸ buttons to select ETHERNET.
- Then press ▾ to enter the ETHERNET submenu.

```
2NDMNU: ../NETWORK/ETHERNET ◂▾▸
<DHCP> IP ADDR SUBNET MASK GATEWAY
```

The following options is available in the ETHERNET menu:

- DHCP - Enable or disable the DHCP client.
- IP ADDR - Manually configure the IP address.
- SUBNET MASK - Manually configure the subnet mask.
- GATEWAY - Manually configure the gateway.
- MAC ADDR - View the PT8643 MAC address.
- NETFINDER - View the NetFinder name.
- ESC - Return to the NETWORK menu.

The DHCP client is enabled as default. When DHCP is enabled the menus IP ADDR, SUBNET MASK and GATEWAY is read only.

Leaving the function using ESC takes you back to the NETWORK menu.

Disable the DHCP client (Set a static IP address):

```
2NDMNU: ../NETWORK/ETHERNET ◂ ▸
DHCP: <On> Off ESC
```

Operation:

- In the ETHERNET submenu use the ◂ and ▸ buttons to select DHCP and press `E` to enter the DHCP submenu.
- Use the ◂ and ▸ buttons to select OFF and press `E` to disable DHCP.
  - When selecting OFF you will automatically enter the IP ADDR submenu.
  - When selecting ON you will automatically return to the ETHERNET submenu.
- If no change is desired, move the cursor to ESC and press ▴.
  Leaving the function takes you back to the ETHERNET submenu.

IP Address configuration:

```
3RDMNU: ../IP ADDR, modify ◀ ▶
000.000.000.001 OK <ESC>
```

- If not already in the IP ADDR submenu use the ◀ and ▶ buttons in the ETHERNET submenu to select IP ADDR and press E .
- Use the ◀ and ▶ buttons to move the cursor between the fields.
- Use the ▲ and ▼ buttons to change the IP address.
- When the desired IP address has been entered, move the cursor to OK and press E to save the changes.
- If no change is desired, move the cursor to ESC and press ▲ .
  Leaving the function takes you back to the ETHERNET submenu.

Subnet mask and gateway configuration:

The subnet mask and gateway is configured the same way as the IP address using the SUBNET MASK and GATEWAY menus.

View MAC address:

```
2NDMNU: ../NETWORK/ETHERNET ◀▲▼▶
MAC ADDR: 00:0b:3c:24:ae:5c <ESC>
```

Operation:

- In the ETHERNET submenu use the ◀ and ▶ buttons to select MAC ADDR. Then press the ▼ button to enter the MAC address submenu.
- The MAC address submenu will show the MAC (Media Access Control) address assigned to the PT8643. This address is globally unique and the first part of the address will always start with 00:0b:3c.
- Use the ▲▼ to exit the menu.
  Leaving the function takes you back to the ETHERNET submenu.

View NetFinder name:

```
2NDMNU: ../NETWORK/ETHERNET ◀▲▼▶
Unnamed.  <ESC>
```

Operation:

- In the ETHERNET sub menu use the ◀ and ▶ buttons to select NETFINDER and press the ▼ button to enter the NetFinder submenu.
  - The NetFinder submenu will show the user assigned name of the PT5300.
  - The NetFinder name can be up to 32 characters long.
  - The Netfinder name is on the network used by the PC software DK-5300 to easily distinguish multiple PT5300 from each other.
  - The NetFinder name can not be changed locally. It must be changed from the PC Software DK-5300.
  - The NetFinder name is not visible if an Ethernet link has not been established.
  - Please see section 10 for further information about the NetFinder protocol and DK-5300.

- Use the ◆buttons to exit the menu.
  Leaving the function takes you back to the ETHERNET submenu.

Network configuration:

- In the NETWORK menu use the ◀ and ▶ buttons to select CONFIG.

```
SUBMNU: NETWORK, select ◀▼▶
ETHERNET <CONFIG> ESC
```

- Then press ▼ button to enter the CONFIG submenu.

```
2NDMNU: ../NETWORK/CONFIG ◀◆▶
<TELNET> PORT RESET PASSWORD ESC
```

The following options is available in the CONFIG menu:

- TELNET - Enable or disable the Telnet Server.
- PORT - View the Telnet port number.
- RESET PASSWORD - Reset the network user name and password to default.
- ESC - Return to the NETWORK menu.

Leaving the function using ESC takes you back to the NETWORK menu.

The Telnet server is used for remote control of the PT5300 over the network.

The Telnet Server is enabled as default.

Disable the Telnet server:

```
2NDMNU: ../NETWORK/CONFIG ◀ ▶
TELNET: <On> Off ESC
```

Operation:

- Use the ◀ and ▶ buttons to select TELNET and press the ▼ button to enter the TELNET submenu.
- Use the ◀ and ▶ buttons to select OFF and press E to disable the Telnet server.
  - The Telnet Enable/Disable function can only be controlled locally.
- If no change is desired, move the cursor to ESC and press ▲.
  Leaving the function takes you back to the CONFIG submenu.

View the Telnet port number:

```
2NDMNU: ../NETWORK/CONFIG ◀ ▶
PORT: 23 <ESC>
```

Operation:

- In the CONFIG submenu use the ◀ and ▶ buttons to select PORT and press the ▼ button to enter the PORT submenu.
  - The Telnet server is as default configured to listen on port 23.
  - The Telnet port number can not be changed locally. It must be changed from the PC Software DK-5300.
  - Please see section 10 for further information about the NetFinder protocol and DK-5300.
- If no change is desired, move the cursor to ESC and press ▲ .
  Leaving the function takes you back to the CONFIG submenu.

Reset the user name and password to default:

```
2NDMNU: ../NETWORK/CONFIG ◀ ▶
RESET PASSWORD <OK> ESC
```

Operation:

- In the CONFIG submenu use the ◀ and ▶ buttons to select RESET PASSWORD and press the ▼ button to enter the RESET PASSWORD submenu.
- To reset the user name and password to default use the ◀ and ▶ buttons to select OK and press E .
  - The user name will be reset to **Admin** and the password will be reset to **2730** .
  - The user name and password is case sensitive.
  - The user name and password can each have a length of 16 characters.
  - The user name and password can be configured from the PC software DK-5300.
  - Please see section 10 for further information about the NetFinder protocol and DK-5300.
- If no change is desired, move the cursor to ESC and press ▲ .
  Leaving the function takes you back to the CONFIG submenu.

ATTENTION!

It is strongly advised to change the default username and password for the Ethernet interface.

Please see section 10.3 for further information.

6.7.6 Menu: PRESET

```
MENU:PRESET, select function ◀▲▶
SUBMNU:<RECALL> STORE NAME ...
```

To recall the Preset, select RECALL

```
SUBMNU:PRESET/RECALL select ◀▲▶
RECALL (PRESET 1) OK ESC
```

Operation:

- Use the ▲ and ▼ buttons to select preset.
- When the desired preset appears in the display, move the cursor to OK and press E . If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the PRESET menu, or if a preset is recalled the Preset Status display will be activated

Whenever a recall is activated, it will apply to the generator until a value in the operation is altered. If a preset has been canceled, the only way to activate it again is to recall the preset.

If a preset is active when you enter the submenu, the submenu will show the selected preset; otherwise Preset 1 will be selected.

When using the PRESET button:

- If a preset is active, pressing the PRESET button will bring up the recall [number], the number in brackets being the preset currently active
- If no preset is active, pressing the PRESET button will bring up "Recall [1]"
- The PRESET button, if you press it repeatedly, will act like the up button, i.e. the next preset is selected

To store the Preset, select STORE

```
SUBMNU:PRESET/STORE, select ◖▲▼◗
STORE1:<PRESET1> OK ESC
```

Operation:

- Use the ▲ and ▼ to select the preset no. to store
- When the desired preset appears in the display, move the cursor to OK and press E
- If no change is desired, move the cursor to ESC and press ▲ leaving the function takes you back to the PRESET menu.

To edit the Preset name, select NAME

```
2NDMNU:PRESET/NAME, edit name ◖▲▼◗E
NAME1:<PRESET1> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to select the preset to be named
- When the desired preset appears in the display press the button E to open the text editor
- Use ◖ button to delete characters while backspacing
- Scroll through the characters with the ◖ and ◗ buttons. The characters being edited will flash during the editing process.
- When the desired characters appears, use the ◖ button to move to the next character to be inserted.
- To exit the editor press E
- To store the programmed line and status, move the cursor to SAVE and press E
- If no change is desired, move the cursor to ESC and press ▲ . Leaving the function takes you back to the PRESET menu.

```
MENU:CONFIG, select function ◂▴▸
SUBMNU:<DATE-TIME> LOCK AUTO-ESC ...
```

```
MENU:CONFIG, select function ◂▴▸
SUBMNU:<LCD-CONTRAST> DOWNLOAD ...
```

```
MENU:CONFIG, select function ◂▴▸
SUBMNU:<RS232 > DIAGNOSE ...
```

6.7.7 Menu: CONFIG

This is the menu for setting parameters not related to the specific output signals.

- Use the ◂ and ▸ buttons to select the parameter to be change
- Then press the ▾ button to enter the submenu

Note: The menu-item "DATE-TIME" is only shown when the PT 8637 Time Clock Interface is mounted.

To change the date and time, select DATE-TIME

The menu is only present with the PT 8637 Time Clock Module mounted.

```
SUBMNU:CONFIG/DATE-TIME, configure ◂▴▸
2NDMNU:<DATE> TIME REFERENCE ...
```

```
SUBMNU:CONFIG/DATE-TIME, configure ◂▴▸
2NDMNU:<OFFSET> ...
```

- Use the ◂ and ▸ buttons to select the parameter to be change
- Then press the ▾ button to enter the 2nd menu

To change the date, select DATE

```
2NDMNU:../DATE-TIME/DATE, modify ◂▴▸
DATE:<YY-MM-DD> 98-05-01 ...
```

Operation:

- Use the ◂ and ▸ buttons to select the parameter to change.
- Use the ▴ and ▸ buttons to change the date format.
- When the desired format appears in the display and /or the date has been set, move the cursor to `SAVE` and press `E`
- Then move the cursor to "DATE FIELD" and press `E` to open an editor in which each digit can be set separately using the ▴ and ▾ buttons. Using the ◂ and ▸ buttons to select digit.
- To exit the editor press `E` . If the edited date is invalid, it will be reset to actual date.
- If no change is desired, move the cursor to ESC and press `E`

Leaving the function takes you back to the CONFIG/DATE-TIME submenu

First field selects between different date formats:

- YY-MM-DD
- DD-MM-YY
- MM-DD-YY

The second field is showing the actual date.

To change the time, select TIME

```
2NDMNU:../DATE-TIME/TIME, modify ◂▴▸
TIME:<24h> 14:19:53 ...
```

Operation:

- Use the ◂ and ▸ buttons to select the parameter to change.
- Use the ▴ and ▾ buttons to change the time format.
- When the desired format appears in the display and /or the time has been set, move the cursor to SAVE and press E . If the edited time is invalid, it will be reset to actual time.
- Then move the cursor to "TIME FIELD" and press E to open an editor in which each digit can be set separately using the ▴ and ▾ buttons. Using the ◂ and ▸ buttons to select digit.
- To exit the editor press E
- When the time has been set, move the cursor to SAVE and press E
- If no change is desired, move the cursor to ESC and press E

Leaving the function takes you back to the CONFIG/DATE-TIME submenu

First field selects between different time formats:

- 24 hours
- 12 hours

The second field is showing the actual time.

To change the reference for Date and Time, select REFERENCE

```
2NDMNU:../DATE-TIME/REFERENCE ◂▴▸
REFERENCE:<LTC Input> ...
```

Operation:

- Use the ▴ and ▾ buttons to change the parameter
- When the desired reference appears in the display, move the cursor to SAVE and press E
- If no change is desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the CONFIG/DATE-TIME submenu.

Reference options:

- "LTC-input" via XLR connector "TIME CODE".
- "1 Hz Reference" via XLR connector.
- "VITC on genlock" time information in genlock signal.

```
2NDMNU:../DATE-TIME/OFFSET ◂▴▸
OFFSET:<10.0> ...
```

- "Video Field Freq", Clock tick rate derived from master oscillator locked to the genlock input.

To change the time offset for Date and Time, select OFFSET

Operation:

- Use the ▲ and ▼ buttons to change the offset time. Step size is 0.1 second
- When the desired offset has been achieved, move the cursor to SAVE and press E
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the CONFIG/DATE-TIME submenu.

To change the lockout function for the keyboard, select LOCK

```
MENU: CONFIG/LOCK, Normal (Off) ◂▴▸
LOCK:<Normal> On SAVE ESC
```

```
MENU: CONFIG/LOCK, Normal (On ) ◂▴▸
LOCK:<Normal> Off SAVE ESC
```

Description: The lock function enables/disables different levels of keyboard operation lockout.

Select NORMAL for partial keyboard lockout. In this mode, the **C.BAR, M.BURST, WINDOW/FLAT, SPECIAL, LINEARITY, PATTERN, PRESET,** and the **OUTPUT** buttons are enabled

The **PRESET** button operates as a shortcut key to recall presets; stored presets can be recalled but not changed.

The **OUTPUT** button operates as a short-cut key to the signal generators. The button toggles between the all test signal generators, if more than one is installed.

Note: If the setup has no test signal generator, the **OUTPUT** button has no function.

Note: A padlock will appear in the top right corner of the display of a locked function.

```
SUBMNU:CONFIG/LOCK, Panel(Off) ◂▴▸
LOCK:<Panel> On SAVE ESC
```

```
SUBMNU:CONFIG/LOCK, Panel(On) ◂▴▸
LOCK:<Panel> Off SAVE ESC
```

Select PANEL for maximal lockout. In this mode no operations are possible, except unlock.

```
SUBMNU:CONFIG/LOCK, Download(On) ◂▴▸
LOCK:<Download> Off SAVE ESC
```

```
SUBMNU:CONFIG/LOCK, Download(Off) ◂▴▸
LOCK:<Download> On SAVE ESC
```

To lock the download function, select DOWNLOAD

```
SUBMNU:CONFIG/LOCK, Date-Time(On) ◂▴▸
LOCK:<Date-Time> Off SAVE ESC
```

```
SUBMNU:CONFIG/LOCK, Date-Time(Off) ◂▴▸
LOCK:<Date-Time> On SAVE ESC
```

```
SUBMNU:CONFIG/LOCK, Diagnose(Off) ◂▴▸
LOCK:<Diagnose> On SAVE ESC
```

```
SUBMNU:CONFIG/LOCK, Diagnose(On) ◂▴▸
LOCK:<Diagnose) Off SAVE ESC
```

To lock the fate and time setting function, select DATE-TIME. This function is only available when PT8637 Time Clock Interface is mounted.

To lock the diagnostic program, select DIAGN0SE. The diagnostic program tests the internal functioning of the generator.

Note: The diagnostic program is non-destructive of generator setting. When the diagnostic program is running, the output signals may be momentarily distorted.

To change the menu auto escape function, select AUTO-ESCAPE.

```
SUBMNU:CONFIG/AUTO-ESC, select ◂▴▸
AUTO RETURN TO STATUS:<Off> SAVE ESC
```

Auto ESC options:

- Off
- On

When the instrument is left in a menu mode, the AUTO ESCAPE function returns the instrument to the last active status display if no key has been activated for 60 seconds.

If the auto escape is disabled, the menu mode will remain active.

To change the contrast level of the display, select LCD-CONTRAST.

```
SUBMNU:CONFIG/LCD-CONTRAST, set ◂▴▸
<xxxx > ESC
```

Use the ▲ and ▼ keys to change the contrast level of the display

To copy the instrument settings from one generator to another, select DOWNLOAD.

The DOWNLOAD function is used when two generators are directly connected by an RS232 interface cable. The cable must be connected to the remote connector on both generators.

The generator to be programmed functions as the master in the procedure. The source generator operates undisturbed during the download procedure.

```
SUBMNU:CONFIG/DOWNLOAD, select ◂▴▸
DOWNLOAD:<Preset#1> OK ESC
```

When the desired download selection is displayed select OK and press E

SPG download options:

- Preset #1
- Preset #2
- Preset #3
- Preset #4

- Preset #5
- Preset #6
- All Presets

Select PRESET #N to download the programming for a specific preset. The programming will be copied to the same preset number in the target generator as is used in the source generator. Select ALL PRESETS to copy all six preset.

Note: Whenever the DOWNLOAD functions are used, either the SPG used must be identical or the modules referred to in the presets must be available at the same positions in both generators.

- To abort the download, press ▲
- The instrument returns to normal operation after completed downloading. If the complete instrument setting has been copied, the instrument will operate according to this setting

CAUTION: Selecting ESC during the downloading process will not reset to the values in use before the downloading process was started. ESC will reset the programming of the selected preset number or the entire instrument to its original factory programming!

To view the RS232 remote communication settings, select RS232.

```
SUBMNU:CONFIG/RS232, select ◀▲▼▶
2NDMNU:<BAUD-RATE> DATA-BIT PARITY ...
```

```
SUBMNU:CONFIG/RS232, select ◀▲▼▶
2NDMNU:<HANDSHAKE> ...
```

- The RS232 settings can not be changed.
- Use the ◀ and ▶ buttons to select the parameter to be accessed.
- Then press the ▼ button to enter the submenu for parameter setting in the RS232 interface.

6.7.8 Menu: ANALOG TPG, Analogue Test Pattern Generator

This is the menu for setting the parameters for the analogue test pattern generator output. This menu is only available in generators fitted with the PT 8631 Analogue Test Pattern Generator option.

```
MENU:ANALOG-TPGx, configure ◀▲▼▶
SUBMNU:<PATTERN> TEXT SYSTEM ...
```

```
MENU:ANALOG-TPGx, configure ◀▲▼▶
SUBMNU:<TIMING> ScH-PHASE ...
```

- Use the ◀ and ▶ buttons to select the parameter to be changed.
- Then press the ▼ button to enter the submenu for the analogue test signal generator

Note: Maximum 2 Analogue Test Pattern Generator (TPG2 and TPG5) can be installed at a time.

To change the output test signal pattern, select PATTERN.

Which patterns are available depends upon the configuration of the test signal generator, i.e. whether the generator output is configured as NTSC or PAL output.

Operation:

```
SUBMNU:ANALOG-TPGx/PATTERN, select ◂▴▸
<SMPTE C.Bar> SAVE ESC
```

```
SUBMNU:ANALOG-TPGx/PATTERN, select ◂▴▸
<Staircase 5step> SAVE ESC
```

```
SUBMNU:ANALOG-TPGx/PATTERN, select ◂▴▸
<PHILIPS 4:3> MODIFY SAVE ESC
```

- Use the ▴ and ▾ buttons to change the pattern selected
- Changes of the pattern are instantaneous, i.e. that any changes are reflected immediately in the output signal
- When the desired pattern appears in the display, move the cursor to SAVE and press E to change the setting
- When then signal "Philips 4:3" appears, an extra item, MODIFY, is shown in the display. Move the cursor to that position to enable access to a menu below. In this menu the default test pattern can be modified. If no changes are desired, move the cursor to ESC and press ▴
- If no changes are desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the ANALOG-TPGx menu.

To change the text/clock inserted in the test pattern, select TEXT.

It is possible to enable user text in the pattern. One user text can be entered for the standard patterns, e.g. Colourbar, Crosshatch etc, while another user text can be entered for the complex patterns, i.e. Philips-4:3 pattern. The CLOCK menu will only appear when the PT8637 Time Clock Interface is mounted.

```
SUBMNU: ANALOG-TPGx/TEXT, configure ◂▴▸
2NDMNU:<EDIT> STYLE CLOCK ESC
```

Operation:

- Use the ◂ and ▸ buttons to select the item to change
- Then press ▾ button to enter the 2nd menu for change of the selected item.

To change the output text/clock inserted in the test pattern, select EDIT.

This menu can display two or three lines of text, depending on the pattern selected. When editing the user text for the complex pattern, text line 1 & 2 will be placed in the pattern according to the selected style.

Note: The third text line in the standard pattern will be overwritten by the date/time information (if enabled).

```
2NDMNU:../EDIT, standard pattern ◂▴▸
LINE1:<TEXT field> OFF SAVE ESC
```

or for text menu for the complex test pattern

```
2NDMNU:../EDIT, complex pattern ◂▴▸
LINE1:<DK-Technologies> OFF SAVE ESC
```

Operation:

- Use the ▴ and ▾ buttons to select the text line to edit.
- To open for editing of the text line, place cursor on text field and press E

- Use ◂ button to delete characters while backspacing.
- Scroll through the characters with the ▴ and ▾ buttons. The characters being edited will flash during the editing process.
- When the desired character appears, use the ▸ button to move to the next character to be inserted.
- To exit the editor press E
- Move the cursor to the status field and use ▴ and ▾ to set line On or Off
- To store the programmed line and status, move the cursor to SAVE and press E .
- Repeat, until the needed lines has been programmed.
- If no change is desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the ANALOG-TPGx/TEXT submenu.

Note: Selecting OFF does not clear the text string. Regional characters are only shown as placeholders in the LCD.

Text insertion options:

- Up to 3 text lines in standard pattern, and 2 text lines in the complex patterns
- Maximum 16 characters per line, and programmed text can be enabled or disabled
- Characters available: all characters A-Z in upper case and in lower case, 0-9,-,_,space, and regional characters

Note: To download text strings with regional characters, the RS232 interface has to be configured for 8 data bits.

To change the position of text, select STYLE

```
2NDMNU:../STYLE, complex pattern ◂▴▾▸
SELECT:<Standard> SAVE ESC
```

Operation:

- Use the ▴ and ▸ buttons to change the Style of text.
- When the desired text style appears, move the cursor to SAVE and press E
- If no change is desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the ANALOG-TPGx/TEXT submenu.

Style options:

- Standard, which will display 3 lines of text in the lower right corner (incl. Optional time information)
- Complex, which will display 2 lines of centered text in the upper and lower text fields for the Philips pattern

Note: The style option cannot be opened in the standard patterns. The user text in standard patterns will be placed in the lower right corner The user text in the complex pattern will depend upon the style selected. The user text can be displayed as standard text with two lines placed in lower right corner, or as a complex text, where text line 1 & 2 will be placed in the upper and lower text field respectively.

To change the insertion of date and time information, select CLOCK.

This menu will turn On/Off the time/date information in the selected pattern, i.e. standard pattern or complex patter. This clock information will use the third text line in the standard pattern, i.e. it is only possible to display two lines of text whenever this information is turned on.

Operation:

```
2NDMNU:../CLOCK, standard pattern ◂▴▸
SELECT:<DATE+TIME> SAVE ESC
```

- Use the ▲ and ▼ buttons to select which time and date information to insert.
- When the desired date and time format appears, move the cursor to SAVE and press E
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the ANALOG-TPGx / TEXT submenu.

Date and Time options:

- NONE
- TIME
- DATE + TIME

Note: The clock information is a property of the pattern, hence it is possible to have enabled the information in the standard pattern and not in the complex pattern.

To change from NTSC to PAL, select SYSTEM.

```
SUBMNU:ANALOG-TPGx/SYSTEM,select ◂▴▸
SYSTEM:<NTSC> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to find the system setting
- When the desired system appears in the display, move the cursor to SAVE and press E to change the system setting
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the ANALOG-TPGx menu.

Analogue signal generator system options:

- NTSC
- PAL
- PAL w/PAL ID

When the system PAL w/PAL ID 7 is selected, a pulse indicating PAL Field 1 is included in line 7.

Note: If the PAL Field 1 pulse in Line 7 is inserted, it is independent of the Sc-H phase setting. If the Sc-H phase has been adjusted, the PAL ID pulse will identify the field as if the phase had not been changed from the nominal setting. When changing the system from PAL to NTSC you must check the timing adjustment: a valid PAL timing may NOT be valid in NTSC. If the timing is not valid in NTSC then it will be reset to +0,+0,+0.

To change the delay/advance timing for, select TIMING.

```
SUBMNU:ANALOG-TPGx/TIMING, edit ◂▴▸
V:<+1> H:+123 T:+00123.4 SAVE ESC
```

Operation:

- Use the ◂ and ▸ buttons to select V, H, or T
- Then use the ▴ and ▾ buttons to change the setting
- Changes to the timing are instantaneous, i.e. any changes are reflected immediately in the output signal
- When the desired setting appears in the display, move the cursor to SAVE and press E to change the setting

The timing can be adjusted by coarse or fine adjustment parameters. The coarsest adjustment is field (V), the finest is time (T), and line (H) is in between. The T value is in nanoseconds.

- The T value can be changed by using the ▴ and ▾ buttons to adjust the smallest step for the adjustment but a faster method is to press E when the cursor is on the T value. This opens an editor in which each of the time digits can be changed using the ▴ and ▾ buttons
- Positions are selected by using the ◂ and ▸ buttons
- To exit the editor press E
- When the desired delay setting appears in the display, move the cursor to SAVE and press E
- If no changes are desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the ANALOG-TPGx menu.

To change the Sc-H phase, select ScH-PHASE.

```
SUBMNU:ANALOG-TPGx/SCH-PHASE ◂▴▾▸
SCH-PHASE:<+0deg> SAVE ESC
```

The default Sc-H phase for the ANALOG-TPGx output is 0 degrees. The value can be changed in steps of 1 degree.

Operation:

- Use the ▴ and ▾ buttons to change Sc-H Phase
- Change to the Sc-H phase is instant, i.e. any change made in the display is reflected immediately in the output signal
- When the desired setting appears in the display, move the cursor to SAVE and press E
- If no change is desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the ANALOG-TPGx menu.

6.7.9 Menu: SD-SDI TPGx, Serial Digital Test Signal Generator.

This is the menu for setting the parameters for the Serial Digital Test Signal Generator output. It covers the menu for SD-SDI Test signal Generator the PT8603

```
MENU:SDI-TPGx, configure ◂▴▾▸
SUBMNU:<PATTERN> TEXT SYSTEM ...
```

```
MENU:SDI-TPGX, configure ◂▴▾▸
SUBMNU:<EDH> EMB.AUDIO TIMING ...
```

- Use the ◂ and ▸ buttons to select the parameter to be changed

```
SUBMNU:SDI-TPGx/PATTERN, select ◂▸
<EBU C.BAR> SAVE ESC
```

```
SUBMNU:SDI-TPGx/PATTERN, select ◂▸
<C.BAR ITU801> SAVE ESC
```

- Then press the ▾ button to enter the submenu for the Serial Digital Test Signal generator

To change the output signal pattern, select PATTERN.

Which patterns are available depends upon the configuration of the SD-SDI test signal generator, i.e. whether the generator output is configured as 525/59.94 or 625/50.

Operation:

- Use the ▴ and ▾ buttons to change the pattern selected
- Changes of the pattern are instantaneous, i.e. any changes are reflected immediately in the output signal
- When the desired pattern appears in the display, move the cursor to SAVE and press E to store the setting
- Move the cursor to that position, to enable access to a menu below. In this menu the default test pattern can be modified
- If no changes are desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the SDI-TPGx configure menu

To change the output text/clock inserted in the test pattern, select TEXT.

It is possible to enable user text in the pattern. Text can be entered in the all patterns, e.g. Colourbar, Crosshatch etc, it can be switched ON of OFF, it can move over the screen and last but not least it can be positioned from the top left corner of the screen to the bottom right corner of the screen, depending on the number of characters in each line and the total number of lines inserted.

To change the output text/clock inserted in the test pattern, select EDIT.

```
SUBMNU: SDI-TPGx/TEXT, configure ◂▸
2NDMNU:<EDIT> ON-OFF MOVEMENT POS ESC
```

Three lines of text with up to 32 character in each line van be inserted.

```
2NDMNU:../EDIT ◂▸
L1:<TEXT field> SAVE ESC
```

Operation:

- Use the ▴ and ▾ buttons to select the text line to edit.
- To open for editing of the text line, place cursor on text field and press E
- Use ◂ button to delete characters while backspacing.
- Scroll through the characters with the ▴ and ▾ buttons. The characters being edited will flash during the editing process.
- When the desired character appears, use the ▸ button to move to the next character to be inserted.
- To exit the editor press E
- To store the programmed line and status, move the cursor to SAVE and press E

- Repeat until all the lines needed has been programmed.
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the SDI-TPGx/TEXT configure submenu.

Text insertion options:

- Up to 3 text lines in standard pattern, and 2 text lines in the complex patterns
- Maximum 32 characters per line, and programmed text can be enabled or disabled
- The text can be positioned from the upper left corner to the bottom right corner of the screen in 44 different horizontal positions and 9 vertical positions
- The text can be switched ON/OFF
- The text can be set to move across the screen
- Characters available: all characters A-Z in upper case and in lower case, 0-9,-,_,space, and regional characters

To switch the text ON/OFF, move the cursor to ON-OFF.

```
SUBMNU: SDI-TPGx/TEXT, configure ◀▲▼▶
2NDMNU: EDIT <ON-OFF> MOVEMENT POS ESC
```

Operation:

- Use the ▼ button to select the ON-OFF menu.
- Use the ▲ and ▼ buttons to select the ON or the OFF
- Move the cursor to `SAVE` and press `E`
- This function takes you back to the SDI-TPGx/TEXT submenu
- Next move the cursor to the MOVEMENT, use ▲ and ▼ to set MOVEMENT ON or OFF
- Move the cursor to `SAVE` and press `E`
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the SDI-TPGx/TEXT submenu.

Note: Selecting OFF does not clear the text string.

Note: To download text strings with regional characters, the RS232 interface has to be configured for 8 data bits.

To change the position of text, select POS

```
2NDMNU: ../POS ◀▲▼▶
X:< +1> Y: +1 SAVE ESC
```

Operation:

- Use the ▲ and ◀ buttons to set the X value for horizontal pos. of the text string
- Next use the ▶ button to get to the Y menu.
- Use the ▲ and ▼ buttons to set the Y value for vertical pos. of the text string
- To get it all stored, move the cursor to `SAVE` and press `E`

```
SUBMNU:SDI-TPGx/SYSTEM, select ◂▴▸
SYSTEM:<525/59.94> SAVE ESC
```

- If no change is desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the SDI-TPGx/TEXT submenu.

To change from 525/59.94 system to 625/50 system, select SYSTEM.

Operation:

- Use the ▴ and ▾ buttons to find the system setting you want
- When the desired system appears in the display, move the cursor to SAVE and press E to change the system setting
- If no change is desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the SDI-TPGx menu.

SDI signal system options:

- 525/59.94
- 625/50

Note: When changing from 625 to 525 lines you must check the timing adjustment. A valid 625 lines timing may NOT be valid in 525 lines. If the timing is not valid in 525 lines then it will be reset.

To enable/disable insertion of EDH information in the SDI-SIGNAL, select EDH.

```
SUBMNU:SDI-TPGx/EDH, select ◂▴▸
EDH-INSERTION:<Off> SAVE ESC
```

Operation:

- Use the ▴ and ▾ buttons to enable/disable insertion of EDH
- Enabling/disabling of the insertion of EDH is instantaneous, i.e. that any change is reflected immediately in the output signal
- When the desired function appears in the display, move the cursor to SAVE and press E to change the setting
- If no changes are desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the SDI-TPGx menu.

EDH insertion options:

- Off
- On

Setting the embedded audio generator

```
SUBMNU:SDI-TPGx/EMB.AUDIO, select ◂▴▸
2NDMNU:<SIGNAL> LEVEL ESC
```

```
2NDMNU:../EMB.AUDIO-SIGNAL,select ◖◆◗
SIGNAL:<Off> SAVE ESC
```

- Use the ◖ and ◗ buttons to select the parameter to change.
- Then press the ▼ to enter the selected 2nd menu.

To select, enable, or disable the embedded audio on the SDI signal, select SIGNAL.

Operation:

- Use the ▲ and ▼ buttons to change the audio signal and audio format. Change of the audio signal/format is instantaneous, i.e. that any change is reflected immediately in the output signal
- When the desired audio signal/format appears in the display, move the cursor to SAVE and press E to change the setting. If no changes are desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the SDI-TPGx/EMB.AUDIO submenu.

The following signals are available as embedded audio from the SDI Test Signal Generators:

Off	
Stereo 800 Hz	No click
Stereo 1 kHz	No click
Stereo EBU 1 kHz	Single click in Ch. A
Stereo BBC 1 kHz	Single click in Ch. A, dual click in Ch. B
Mono EBU 1 kHz	Signal click in both Ch. A and Ch.B
Mono 1 kHz	No click
Dual 1 kHz 400 Hz	No click

To change the level of the audio signal embedded on the SDI-SIGNAL.

```
SUBMNU:SDI-TPGx/EMB.AUDIO-LEVEL ◖◆◗
LEVEL:<Silence> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to change the embedded audio signal level. Change of the embedded audio signal level is instantaneous, i.e. that any change is reflected immediately in the output signal
- When the desired embedded audio signal level appears in the display, move the cursor to SAVE and press E to change the setting
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the SDI-TPGx/EMB.AUDIO sub menu

SDI embedded audio level options:

- Silence
- 0 dBFS
- -9 dBFS
- -12 dBFS
- -14 dBFS
- -16 dBFS
- -18 dBFS
- -20 dBFS

```
2NDMNU:../EMB.AUDIO/GROUP, select ◂▸
GROUP:<1, Chan 1-4> SAVE ESC
```

To change the position of the embedded audio, select GROUP

Operation:

- Use the ▴ and ▾ buttons to select between the 4 audio groups. Change of the embedded audio group is instantaneous, i.e. that any change is reflected immediately in the output signal.
- When the desired group appears in the display, move the cursor to SAVE and press E . If no change is desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the SDI TPGx/EMB.AUDIO sub menu.

Embedded audio groups options:

- 1, Chan 1-4
- 2, Chan 5-8
- 3, Chan 9-12
- 4, Chan 13-16

To change the delay/advance timing for the SDI-SIGNAL output, select TIMING.

```
MENU:SDI-TPGx/TIMING, edit delay ◂▸
v:<-1> H:-12 T:-00123.4 SAVE ESC
```

Operation:

- Use the ◂ or ▸ buttons to select V, H, or T
- Then use the ▴ and ▾ buttons to change the setting. Changes to the timing are instantaneous, i.e. any changes are reflected immediately in the output signal
- When the desired setting appears in the display, move the cursor to SAVE and press E to change the setting

The timing can be adjusted by coarse or fine adjustment parameters. The coarsest adjustment is field (V), the finest is time (T), and line (H) is in between. The T value is in nanoseconds, with a resolution of approximately 37.5 ns.

- The T value can be changed by using the ▴ and ▾ buttons to adjust the smallest step for the adjustment but a faster method is to press E , when the cursor is on the T value. This opens an editor in which each of the digits can be changed using the ▴ and ▾ buttons with resolution of 37.5 ns
- Positions are selected by using the ◂ and ▸ buttons
- To exit the editor press E
- When the desired delay setting appears in the display, move the cursor to SAVE and press E
- If no changes are desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the SDI-TPGx menu.

```
MENU:SDI-TPGx, configure ◂ ▴ ▸
SUBMNU:<PATTERN> TEXT SYSTEM ...
```

```
MENU:SDI-TPGX, configure ◂ ▴ ▸
SUBMNU:<EDH> EMB.AUDIO-SIGNAL ...
```

6.7.10 Menu: SD-SDI TPGx, Serial Digital Test Pattern Generators

This is the menu for setting the parameters for the Serial Digital Pattern Signal Generator output. Two different generators are available. The PT8632 and PT8633. The difference is the number of test signal patterns included, and embedded audio features

- Use the ◂ and ▸ buttons to select the parameter to be changed
- Then press the ▾ button to enter the submenu for the Serial Digital Test Pattern generator

To change the output test signal pattern, select PATTERN.

Which patterns are available depends upon the configuration of the test signal generator, i.e. whether the generator output is configured as 525/59.94 or 625/50.

```
MENU:SDI-TPGx/PATTERN, select ◂ ▴ ▸
<Staircase 5step> SAVE ESC
```

```
MENU:SDI-TPGx/PATTERN, select ◂ ▴ ▸
<Philips 4:3> MODIFY SAVE ESC
```

Operation:

- Use the ▴ and ▾ buttons to change the pattern selected. Changes of the pattern are instantaneous, i.e. any changes are reflected immediately in the output signal
- When the desired pattern appears in the display, move the cursor to `SAVE` and press `E` to store the setting
- When the signal "Philips...", or "FuBK..." appears, an extra item MODIFY, is shown in the display. Move the cursor to that position, to enable access to a menu below. In this menu the default test pattern can be modified
- If no changes are desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the SDI-TPGx menu.

To change the text/clock inserted in the test pattern, select TEXT.

It is possible to enable user text in the pattern. One user text can be entered for the standard patterns, e.g. Colourbar, Crosshatch etc, while another user text can be entered for the complex patterns, i.e. Philips-4:3 pattern.

The CLOCK menu will only appear when the PT8637 Time Clock Interface is mounted.

```
SUBMNU: SDI-TPGx/TEXT, configure ◂ ▴ ▸
2NDMNU:<EDIT> STYLE CLOCK ESC
```

Operation:

- Use the ◂ and ▸ buttons to select the item to change
- Then press ▾ button to enter the 2nd menu for change of the selected item.

```
2NDMNU:../EDIT, standard pattern ◀▲▼▶
LINE1:<TEXT field> OFF SAVE ESC
```

To change the output text/clock inserted in the test pattern, select EDIT.

This menu can display two or three lines of text, depending on the pattern selected. When editing the user text for the complex pattern, text line 1 & 2 will be placed in the pattern according to the selected style. It should be noted that text line 3 in the standard pattern will be overwritten by the date/time information (if enabled).

or for text menu for the complex test pattern

```
2NDMNU:../EDIT, complex pattern ◀▲▼▶
LINE1:<DK-Technologies> OFF SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to select the text line to edit.
- To open for editing of the text line, place cursor on text field and press E
- Use ◀ button to delete characters while backspacing. Scroll through the characters with the ▲ and ▼ buttons. The characters being edited will flash during the editing process.
- When the desired character appears, use the ▶ button to move to the next character to be inserted.
- To exit the editor press E
- Move the cursor to the status field and use ▲ and ▼ to set line On or Off
- To store the programmed line and status, move the cursor to SAVE and press E
- Repeat, until the needed lines has been programmed.
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the SDI-TPGx/TEXT submenu.

Note: Selecting OFF does not clear the text string.

Text insertion options:

- Up to 3 text lines in standard pattern, and 2 text lines in the complex patterns
- Maximum 15 characters per line, and programmed text can be enabled or disabled
- Characters available: all characters A-Z in upper case and in lower case, 0-9,-,_,space, and regional characters

Note: To download text strings with regional characters, the RS232 interface has to be configured for 8 data bits.

To change the position of text, select STYLE

```
2NDMNU:../STYLE, complex pattern ◀▲▼▶
SELECT:<Standard> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to change the Style of text.
- When the desired text style appears, move the cursor to SAVE and press E
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the SDI-TPGx/TEXT submenu.

Style options:

- Standard, which will display 3 lines of text in the lower right corner.
- Complex, which will display 2 lines of centered text in the upper and lower text fields for the Philips pattern
- Complex, which will display 2 lines of centered text in the left and right text fields of the FuBK patterns.

Note: The style option cannot be opened the standard pattern. The user text in standard patterns will be placed in the lower right corner The user text in the complex pattern will depend upon the style selected. The user text can be displayed as standard text with two lines placed in lower right corner, or as a complex text, where text line 1 & 2 will be placed in the upper and lower text field respectively.

To change the insertion of date and time information, select CLOCK.

This menu will turn On/Off the time/date information in the selected pattern, i.e. standard pattern or complex patter. This clock information will use the third text line in the standard pattern, i.e. it is only possible to display two lines of text whenever this information is turned on.

```
2NDMNU:../Clock, standard pattern ◀▲▼▶
SELECT:<DATE+TIME> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to select which time and date information to insert.
- When the desired date and time format appears, move the cursor to SAVE and press E
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the ANALOG-TPGx/TEXT submenu.

Date and Time options:

- NONE
- TIME
- DATE + TIME

Note: The clock information is a property of the pattern, hence it is possible to have enabled the information in the standard pattern and not in the complex pattern.

To change from 525/59.94 system to 625/50 system, select SYSTEM.

```
SUBMNU:SDI-TPGx/SYSTEM, select ◀▲▼▶
SYSTEM:<525/59.94> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to find the system setting you want
- When the desired system appears in the display, move the cursor to SAVE and press E to change the system setting
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the SDI-TPGx menu.

SDI signal system options:

- 525/59.94
- 625/50

Note: When changing from 625 to 525 lines you must check the timing adjustment. A valid 625 lines timing may NOT be valid in 525 lines. If the timing is not valid in 525 lines then it will be reset.

To enable/disable insertion of EDH information in the SDI-SIGNAL, select EDH.

```
SUBMNU:SDI-TPGx/EDH, select ◀▲▼▶
EDH-INSERTION:<Off> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to enable/disable insertion of EDH
- Enabling/disabling of the insertion of EDH is instantaneous, i.e. that any change is reflected immediately in the output signal
- When the desired function appears in the display, move the cursor to SAVE and press E to change the setting
- If no changes are desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the SDI-TPGx menu.

EDH insertion options:

- Off
- On

Setting the embedded audio generator

```
SUBMNU:SDI-TPGx/EMB.AUDIO, select ◀▲▼▶
2NDMNU:<SIGNAL> LEVEL GROUP ESC
```

- Use the ◀ and ▶ buttons to select the parameter to change.
- Then press the ▼ to enter the selected 2nd menu.

To select, enable, or disable the embedded audio on the SDI signal, select SIGNAL.

```
2NDMNU:../EMB.AUDIO-SIGNAL,select ◀▲▼▶
SIGNAL:<Off> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to change the audio signal and audio format. Change of the audio signal/format is instantaneous, i.e. that any change is reflected immediately in the output signal
- When the desired audio signal/format appears in the display, move the cursor to SAVE and press E to change the setting. If no changes are desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the SDI-TPGx/EMB.AUDIO submenu.

The following signals are available as embedded audio from the SDI Test Signal Generators:

Off	
Stereo 800 Hz	No click
Stereo 1 kHz	No click
Stereo EBU 1 kHz	Single click in Ch. A
Stereo BBC 1 kHz	Single click in Ch. A, dual click in Ch. B
Mono EBU 1 kHz	Signal click in both Ch. A and Ch.B
Mono 1 kHz	No click
Dual 1 kHz 400 Hz	No click

To change the level of the audio signal embedded on the SDI-SIGNAL.

```
SUBMNU:SDI-TPGx/EMB.AUDIO-LEVEL ◂▴▸
LEVEL:<Silence> SAVE ESC
```

Operation:

- Use the ▴ and ▾ buttons to change the embedded audio signal level
- Change of the embedded audio signal level is instantaneous, i.e. that any change is reflected immediately in the output signal
- When the desired embedded audio signal level appears in the display, move the cursor to `SAVE` and press `E` to change the setting
- If no change is desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the SDI-TPGx/EMB.AUDIO sub menu

SDI embedded audio level options:

- Silence
- 0 dBFS
- -9 dBFS
- -12 dBFS
- -14 dBFS
- -16 dBFS
- -18 dBFS
- -20 dBFS

To change the position of the embedded audio, select GROUP

```
2NDMNU:../EMB.AUDIO/GROUP, select ◂▴▸
GROUP:<1, Chan 1-4> SAVE ESC
```

Operation:

- Use the ▴ and ▾ buttons to select between the 4 audio groups. Change of the embedded audio group is instantaneous, i.e. that any change is reflected immediately in the output signal.
- When the desired group appears in the display, move the cursor to `SAVE` and press `E` . If no change is desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the SDITPGx/EMB.AUDIO sub menu.

Embedded audio groups options:

- 1, Chan 1-4
- 2, Chan 5-8
- 3, Chan 9-12
- 4, Chan 13-16

To change the delay/advance timing for the SDI-SIGNAL output, select TIMING.

```
MENU:SDI-TPGx/TIMING, edit delay ◂▴▸
v:<-1> H:-12 T:-00123.4 SAVE ESC
```

Operation:

- Use the ◂ or ▸ buttons to select V, H, or T
- Then use the ▴ and ▾ buttons to change the setting. Changes to the timing are instantaneous, i.e. any changes are reflected immediately in the output signal
- When the desired setting appears in the display, move the cursor to `SAVE` and press `E` to change the setting

The timing can be adjusted by coarse or fine adjustment parameters. The coarsest adjustment is field (V), the finest is time (T), and line (H) is in between. The T value is in nanoseconds, with a resolution of approximately 37.5 ns.

- The T value can be changed by using the ▴ and ▾ buttons to adjust the smallest step for the adjustment but a faster method is to press `E` , when the cursor is on the T value. This opens an editor in which each of the digits can be changed using the ▴ and ▾ buttons with resolution of 37.5 ns
- Positions are selected by using the ◂ and ▸ buttons
- To exit the editor press `E`
- When the desired delay setting appears in the display, move the cursor to `SAVE` and press `E`
- If no changes are desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the SDI-TPGx menu.

6.7.11 Menu: HD & SD-SDI, Serial Digital Test Signal Generator

This is the menu for setting the parameters for the PT 8612 HD-SD Serial Digital Signal Generator output.

```
MENU:HD-SDI, configure ◂▴▸
SUBMNU:<HD1> HD2 HD3 HD4
```

```
SUBMNU:HD-SDI/HD1, Select ◂▴▸
2NDMNU:<PATTERN> SYSTEM TIMING ...
```

```
SUBMNU:HD-SDI/HD1, Select ◂▴▸
2NDMNU:<AUDIO> TEXT ...
```

- Use the ◂ and ▸ buttons to select the parameter to be changed
- Then press the ▾ button to enter the submenu for the Serial Digital Test Pattern generator

```
2NDMNU:../HD1/PATTERN, select ◂▴▸
<COLORBAR> MODIFY SAVE ESC
```

```
2NDMNU:../MODIFY, COLORBAR ◂▴▸
MODIFY:<100/0/75/0> SAVE ESCt'
```

To change the output test signal pattern, select PATTERN.

To change the LEVELS of the test signal pattern, select levels.

Operation:

- Use the ▴ and ▾ buttons to change the pattern selected
- Changes of the pattern are instantaneous, i.e. any changes are reflected immediately in the output signal
- When the desired pattern appears in the display, move the cursor to SAVE and press E to store the setting
- Move the cursor to that position, to enable access to a menu below. In this menu the default test pattern can be modified
- If no changes are desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the HD-SDI/HD1,select submenu.

It is possible to enable user text in the pattern. The user text can be entered for the standard patterns, e.g. Colourbar, Crosshatch etc.

To change the text inserted in the test pattern, select TEXT.

```
2NDMNU: ../HD1/TEXT, select ◂▴▸
2NDMNU:<EDIT> SCALE POS MOVEMENT ...
```

```
2NDMNU: ../HD1/TEXT, select ◂▴▸
2NDMNU:<TEXT COLOR> BACKGROUND COLOR ...
```

Operation:

- Use the ◂ and ▸ buttons to select the item to change.
- Then press ▴ button to enter the 2nd menu for change of the selected item. To change the output text inserted in the test pattern, select EDIT.

```
2NDMNU:../TEXT/EDIT, select ◂▴▸
LINE1:<TEXT1> OFF SAVE ESC
```

Operation:

- Use the ▴ and ▾ buttons to select one of the 3 text lines to edit.
- To open for editing of the text line, place cursor on text field and press E
- Use ◂ button to delete characters while backspacing.
- Scroll through the characters with the ▴ and ▸ buttons. The characters being edited will flash during the editing process.
- When the desired character appears, use the ▸ button to move to the next character to be inserted.
- To exit the editor press E

- Move the cursor to the status field and use ▲ and ▼ to set line On or Off
- To store the programmed line and status, move the cursor to SAVE and press E
- Repeat, until the needed lines has been programmed.
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the ../HD1/TEXT, select submenu.

Note: Selecting OFF does not clear the text string.

Text insertion options:

- Up to 3 text lines with maximum 16 characters per line. Programmed text can be enabled or disabled
- Characters available: all characters A-Z in upper case and in lower case, 0-9,-,_,space, and regional characters

Note: To download text strings with regional characters, the RS232 interface has to be configured for 8 data bits.

To change the position of text, select POS

```
2NDMNU:../TEXT/POS, select ◀▲▶
X:< +1> V +2 SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to change the position of text.
- When the desired pos. is reached, move the cursor to SAVE and press E
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the ../HD1/TEXT, select 2ndmenu.

Movement options:

- VERTICAL, text move from top to button.
- HORIZENTAL, text move from left to right.
- BOTH, text move from left upper corner to bottom right corner of the screen.
- OFF, no moving text.

Operation:

- Use the ▲ and ▼ buttons to select movement to insert.
- When the desired mode and text appears, move the cursor to SAVE and press E
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the HD1/TEXT 2ndmenu

To change from one system to another , select SYSTEM.

```
2NDMNU:../HD1/SYSTEM,select ◀▲▶
<HD 720P/25> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to find the system setting you want
- When the desired system appears in the display, move the cursor to SAVE and press E to change the system setting
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the HD-SDI/HD1,select submenu.

HD-SD SDI signal system options:

- 1080p/60
- 1080p/59.94
- 1080p/50
- 1080p/30
- 1080p/29.97
- 1080p/25
- 1080p/24
- 1080p/23.96
- 1080i/30
- 1080i/29.97
- 1080i/25
- 720p/60
- 720p/59.94
- 720p/50
- 720p/30
- 720p/29.97
- 720p/25
- 720p/24
- 720p/23.9

Setting the embedded audio generator, select AUDIO

```
SUBMNU:../HD1/AUDIO, select ◀▲▶
2NDMNU:<SIGNAL> LEVEL ...
```

```
SUBMNU:../HD1/AUDIO, select ◀▲▶
2NDMNU:<click offset> ...
```

- Use the ◀ and ▶ buttons to select the parameter to change
- Then press the ▼ to enter the selected 2nd menu.

To select, enable, or disable the embedded audio on the SDI signal, select SIGNAL.

```
2NDMNU:../AUDIO/SIGNAL,select ◀▲▶
SIGNAL:<Off> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to change the audio signal and audio format. Change of the audio signal/format is instantaneous, i.e. that any change is reflected immediately in the output signal
- When the desired audio signal/format appears in the display, move the cursor to SAVE and press E to change the setting. If no changes are desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the ../HD1/AUDIO, select 2ndmenu.

The following signals are available as embedded audio from the Dual HD-SD SDI Test Signal Generators:

- Off
- Silence
- Sine
- Click

To change the level of the audio signal embedded on the DL-signal.

```
2NDMNU:S../AUDIO/LEVEL, select ◖▲▼▶
LEVEL:<-12dBFS> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to change the embedded audio signal level
- Change of the embedded audio signal level is instantaneous, i.e. that any change is reflected immediately in the output signal
- When the desired embedded audio signal level appears in the display, move the cursor to SAVE and press E to change the setting
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the ../HD1/AUDIO,select 2ndmenu

SDI embedded audio level options:

- 0 dBFS
- -6 dBFS
- -12 dBFS
- -18 dBFS
- -24 dBFS

To change the timing of the CLICK in the LIP sync signal

```
2NDMNU:../HD1/AUDIO, select ◖▲▼▶
2NDMNU:<CLICK OFFSET> ...
```

```
2NDMNU:./AUDIO CLICK OFFSET, select ◖ ▶E
OFFSET: +1ns <SAVE> ESC
```

Operation:

- Use the ▲ and ▼ buttons to select CLICK OFFSET. Change of OFFSET CLICK is instantaneous, i.e. that any change is reflected immediately in the output signal.
- When the desired group appears in the display, move the cursor to SAVE and press E . If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the ../HD1/AUDIO, select 2ndmenu.

To change the delay/advance timing for the HD-SIGNAL output, select TIMING.

Operation:

```
2NDMNU:../HD1/TIMING, edit delay ◂▴▸
F:< 0> H:0001 T:-00123.4 SAVE ESC
```

- Use the ◂ or ▸ buttons to select F, H, or T
- Then use the ▴ and ▾ buttons to change the setting. Changes to the timing are instantaneous, i.e. any changes are reflected immediately in the output signal
- When the desired setting appears in the display, move the cursor to SAVE and press E to change the setting

The timing can be adjusted by coarse or fine adjustment parameters. The coarsest adjustment is field (F), the finest is time (T), and line (H) is in between. The T value is in nanoseconds, with a resolution of approximately 6.7 ns.

- The T value can be changed by using the ▴ and ▾ buttons to adjust the smallest step for the adjustment but a faster method is to press E , when the cursor is on the T value. This opens an editor in which each of the digits can be changed using the ▴ and ▾ buttons with resolution of 6.7 ns
- Positions are selected by using the ◂ and ▸ buttons
- To exit the editor press E
- When the desired delay setting appears in the display, move the cursor to SAVE and press E
- If no changes are desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the HD-SDI/HD1 submenu.

6.7.12 Menu: Dual Link HD & SD-SDI, Serial Digital Test Signal Generator

This is the menu for setting the parameters for the PT 8613 Dual Link HD-SD Serial Digital Signal Generator output. The Dual link facility is only available in the 1080i & 1080p formats

```
MENU:DL-SDI, configure ◂▴▸
SUBMNU:<DL1> DL2
```

```
SUBMNU:DL-SDI/DL1, Select ◂▴▸
2NDMNU:<PATTERN> SYSTEM TIMING ...
```

```
SUBMNU:DL-SDI/DL1, Select ◂▴▸
2NDMNU:<AUDIO> TEXT ...
```

- the ◂ and ▸ buttons to select the parameter to be changed
- Then press the ▾ button to enter the submenu for the Serial Digital Test Pattern generator

To change the output test signal pattern, select PATTERN.

```
2NDMNU:../DL1/PATTERN, select ◂▴▸
<COMBINATION> LEVELS SAVE ESC
```

To change the LEVELS of the test signal pattern, select levels.

```
2NDMNU:../LEVELS, COMBINATION ◂▴▸
<100/0/75/0> ESC
```

Operation:

- Use the ▲ and ▼ buttons to change the pattern selected
- Changes of the pattern are instantaneous, i.e. any changes are reflected immediately in the output signal
- When the desired pattern appears in the display, move the cursor to SAVE and press E to store the setting
- Move the cursor to that position, to enable access to a menu below. In this menu the default test pattern can be modified
- If no changes are desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the ../DL1/PATTERN 2ndmenu.

It is possible to enable user text in the pattern. The user text can be entered for the standard patterns, e.g. Colourbar, Crosshatch etc.

To change the text inserted in the test pattern, select TEXT.

```
2NDMNU: ../DL1/TEXT, select ◀▲▼▶
2NDMNU:<EDIT> SCALE POS MOVEMENT ...
```

```
2NDMNU: ../DL1/TEXT, select ◀▲▼▶
2NDMNU:<TEXT COLOR> BACKGROUND COLOR ...
```

Operation:

- Use the ◀ and ▶ buttons to select the item to change
- Then press ▼ button to enter the 2nd menu for change of the selected item.

To change the output text inserted in the test pattern, select EDIT.

```
2NDMNU:../TEXT/EDIT, select ◀▲▼▶
LINE1:<TEXT1> OFF SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to select one of the 3 text lines to edit.
- To open for editing of the text line, place cursor on text field and press E
- Use ◀ button to delete characters while backspacing.
- Scroll through the characters with the ▲ and ▼ buttons. The characters being edited will flash during the editing process.
- When the desired character appears, use the ▶ button to move to the next character to be inserted.
- To exit the editor press E
- Move the cursor to the status field and use ▲ and ▼ to set line On or Off
- To store the programmed line and status, move the cursor to SAVE and press E
- Repeat, until the needed lines has been programmed.
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the ../DL1/TEXT, select 2ndmenu.

Note: Selecting OFF does not clear the text string.

Text insertion options:

- Up to 3 text lines with maximum 16 characters per line. Programmed text can be enabled or disabled
- Characters available: all characters A-Z in upper case and in lower case, 0-9,-,_,space, and regional characters

Note: To download text strings with regional characters, the RS232 interface has to be configured for 8 data bits.

To change the position of the text, select POS.

```
2NDMNU:../TEXT/POS, select ◖◆◗
X:< +1> V +2 SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to change the position of text.
- When the desired pos. is reached, move the cursor to SAVE and press E
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the ../DL1/TEXT, select 2ndmenu.

To select the movement of the text, select MOVEMENT.

```
2NDMNU:../TEXT/MOVEMENT, select ◖◆◗
SELECT:<BOTH> SAVE ESC
```

Movement options:

- VERTICAL, text move from top to button.
- HORIZENTAL, text move from left to right.
- BOTH, text move from left upper corner to button right corner of the screen.
- OFF, no moving text.

Operation:

- Use the ▲ and ▼ buttons to select movement to insert.
- When the desired mode and text appears, move the cursor to SAVE and press E
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the ../DL1/TEXT select 2ndmenu.

To change from one system to another , select SYSTEM.

```
2NDMNU:../DL1/SYSTEM,select ◖◆◗
<HD 720P/25> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to find the system setting you want
- When the desired system appears in the display, move the cursor to SAVE and press E to change the system setting
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the DL-SDI/DL1, select submenu.

HD-SD SDI signal system options:

- 1080p/60
- 1080p/59.94
- 1080p/50
- 1080p/30
- 1080p/29.97
- 1080p/25
- 1080p/24
- 1080p/23.96
- 1080sF/30
- 1080sF/29.97
- 1080sF/25
- 1080sF/24
- 1080sF/23.98
- 1080i/30
- 1080i/29.97
- 1080i/25
- 720p/60
- 720p/59.94
- 720p/50
- 720p/30
- 720p/29.97
- 720p/25
- 720p/24
- 720p/23.9
- 525/59.94
- 625/50

Note: All 1080 systems are available as Dual Link and single link signals. All other signals are only available as std. single line signals. In single line systems the 2nd output is HD-SD SDI black.

When changing from one system to the other you must check the timing adjustment. A timeplane valid system may NOT be valid in another system. If the timing is not valid then it will be reset to zero.

To change to DUAL / SINGLE link systems , select INTERFACE.

```
2NDMNU:../DL1/SYSTEM, ◂▴▸
HD 1080P/25 <INTERFACE> SAVE ESC
```

To change to DUAL / SINGLE link format, use the ▴ and ▾ buttons

```
2NDMNU:../INTERFACE,HD 1080P,25 ◂▴▸
<DUAL 4:4:4:4 GBRA 12-bit> SAVE ESC
```

Operation:

- Use the ▴ and ▾ buttons to change the output format. Change of the format is instantaneous, i.e. that any change is reflected immediately in the output signal
- When the desired format appears in the display, move the cursor to SAVE and press E to change the setting. If no changes are desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the ..DL1/SYSTEM 2ndmenu.

The following FORMATS are available in Dual HD-SD SDI Test Signal Generators:

- Dual 4:4:4:4 GBRA 12-bit
- Dual 4:4:4 GBR 10-bit
- Dual 4:4:4:4 YC_BC_RA 12-bit
- Dual 4:4:4 YC_BC_R10-bit
- Dual 4:2:2:4 YC_BC_RA 12-bit
- SINGLE Dual 4:2:2 YC_BC_R10-bit

Setting the embedded audio generator, select AUDIO

```
SUBMNU:../DL1/AUDIO, select ◖◆◗
2NDMNU:<SIGNAL> LEVEL ...
```

```
SUBMNU:../DL1/AUDIO, select ◖◆◗
2NDMNU:<click offset> ...
```

- Use the ◖ and ◗ buttons to select the parameter to change.
- Then press the ▼ to enter the selected 2nd menu.

To select, enable, or disable the embedded audio on the SDI signal, select SIGNAL.

```
2NDMNU:../AUDIO/SIGNAL,select ◖◆◗
SIGNAL:<Off> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to change the audio signal and audio format. Change of the audio signal/format is instantaneous, i.e. that any change is reflected immediately in the output signal
- When the desired audio signal/format appears in the display, move the cursor to SAVE and press E to change the setting
- If no changes are desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the ../DL1/AUDIO, select 2ndmenu.

The following signals are available as embedded audio from the Dual HD-SD SDI Test Signal Generators:

- Off
- Silence
- Sine
- Click

To change the level of the audio signal embedded on the DL-signal.

```
2NDMNU:S../AUDIO/LEVEL, select ◖◆◗
LEVEL:<-12dBFS> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to change the embedded audio signal level
- Change of the embedded audio signal level is instantaneous, i.e. that any change is reflected immediately in the output signal
- When the desired embedded audio signal level appears in the display, move the cursor to SAVE and press E to change the setting

- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the SDI-TPGx/EMB.AUDIO sub menu

SDI embedded audio level options:

- 0 dBFS
- -6 dBFS
- -12 dBFS
- -18 dBFS
- -24 dBFS

To change the timing of the CLICK in the LIP sync signal

```
2NDMNU:../DL1/AUDIO, select ◀▲▼▶
2NDMNU:<CLICK OFFSET> ...
```

```
2NDMNU:./AUDIO CLICK OFFSET, select ◀▲▼▶
OFFSET:< +1ns> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to select CLICK OFFSET. Change of OFFSET CLICK is instantaneous, i.e. that any change is reflected immediately in the output signal.
- When the desired group appears in the display, move the cursor to `SAVE` and press `E`
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the ../DL1/AUDIO, select.

To change the delay/advance timing for the DL-SIGNAL output, select TIMING.

```
2NDMNU:../DL1/TIMING, edit delay ◀▲▼▶
F:< 0> H:0001 T:-00123.4 SAVE ESC
```

Operation:

- Use the ◀ or ▶ buttons to select F, H, or T
- Then use the ▲ and ▼ buttons to change the setting. Changes to the timing are instantaneous, i.e. any changes are reflected immediately in the output signal
- When the desired setting appears in the display, move the cursor to `SAVE` and press `E` to change the setting

The timing can be adjusted by coarse or fine adjustment parameters. The coarsest adjustment is field (F), the finest is time (T), and line (H) is in between. The T value is in nanoseconds, with a resolution of approximately 6.7 ns.

- The T value can be changed by using the ▲ and ▼ buttons to adjust the smallest step for the adjustment but a faster method is to press `E` , when the cursor is on the T value. This opens an editor in which each of the digits can be changed using the ▲ and ▼ buttons with resolution of 6.7 ns
- Positions are selected by using the ◀ and ▶ buttons
- To exit the editor press `E`
- When the desired delay setting appears in the display, move the cursor to `SAVE` and press `E`
- If no changes are desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the DL-SDI/DL1,select submenu.

6.7.13 Menu: AES-EBU, Dual AES/EBU Digital Audio Generator

This is the menu for setting the parameters the PT 8635 Dual AES/EBU Digital Audio Generator.

This generator has two independent AES/EBU outputs which supplies test tones or silence. Furthermore this option has a separate Word-clock output.

Setting the AES/EBU Digital Audio Generator

```
MENU:AES-EBU, configure ◂▴▸
SUBMNU:<AES-EBU1> <AES-EBU2> ...
```

```
MENU:AES-EBU1, configure output ◂▴▸
2NDMNU:<SIGNAL> LEVEL TIMING ...
```

- Use the ◂ and ▸ buttons to select the parameter to be changed
- Then press the ▾ button to enter the 2nd menu for the AES/EBU audio generator

To select the audio signal output, select SIGNAL

```
2NDMNU:../AES-EBUx/SIGNAL select ◂▴▸
SIGNAL:<Stereo 800 Hz> SAVE ESC
```

Operation:

- Use the ▴ and ▾ buttons to change the audio signal selection
- Changes of the audio signal are instantaneous, i.e. that any changes are reflected immediately in the output signal
- When the desired audio signal appears in the display, move the cursor to `SAVE` and press `E` to change the setting
- If no changes are desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the AES-EBUx menu.

Signal options:

Stereo 800 Hz	No click
Stereo 1 kHz	No click
Stereo EBU 1 kHz	Single click in Ch. A
Stereo BBC 1 kHz	Single click in Ch. A, dual click in Ch. B
Mono EBU 1 kHz	Signal click in both Ch. A and Ch. B
Mono 1 kHz	No click
Dual 1 kHz 400 Hz	No click
Wordclock 48 kHz	reference

Note: When the 48 kHz reference square wave signal is selected, the signal and level are not adjustable.

To change the level of the AES/EBU audio signal level, select LEVEL.

```
2NDMNU:../AES-EBUx/LEVEL select ◂▴▸
LEVEL:<Silence> SAVE ESC
```

Operation:

- Use the ▴ and ▾ buttons to change the audio signal selection

- Changes of the audio signal are instantaneous, i.e. that any changes are reflected immediately in the output signal
- When the desired audio signal appears in the display, move the cursor to SAVE and press E to change the setting
- If no changes are desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the AES-EBUx menu.

AES/EBU level options:

- Silence
- 0 dBFS
- -9 dBFS
- -12 dBFS
- -14 dBFS
- -16 dBFS
- -18 dBFS
- -20 dBFS

Note: If you select silence, the data bit indicating stereo, mono, or dual sound will continue to be active.

To change the phase timing of the AES/EBU audio data, select TIMING.

```
2NDMNU:../AES-EBUx/TIMING, select ◀▲▼▶
TIMING:<PAL> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to change the audio signal selection
- Changes of the audio signal are instantaneous, i.e. that any changes are reflected immediately in the output signal
- When the desired audio signal appears in the display, move the cursor to SAVE and press E to change the setting
- If no changes are desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the AES-EBU menu.

AES/EBU audio timing options:

- PAL
- NTSC Phase 1
- NTSC Phase 2
- NTSC Phase 3
- NTSC Phase 4
- NTSC Phase 5

Note: Only one phase is needed for audio in PAL environments, due to the simple relation between the audio sample rate and the PAL system. For audio in NTSC, five different phases are required to be able to synchronize under all circumstances.

```
MENU:SDI-TSGx, configure ◖◆◗
SUBMNU:<PATTERN> SYSTEM EDH ...
```

```
MENU:SDI-TPGX, configure ◖◆◗
SUBMNU:<EMB.AUDIO> TIMING ...
```

6.7.14 Menu: SDI-TSG, SDI Test Signal Generator - Basic

In this is the menu the PT8639 Test Signal generator is configured. This generator delivers all basic SDI test signals and includes embedded audio.

Up to 3 SDI-TSG's (PT5639) can be mounted at a time, each output is numbered according to its position.

The submenu allows changes to be made for the parameters for the SDI-TSGx output

To change the output signal pattern, select PATTERN.

Which patterns are available depends upon the configuration of the test signal generator, i.e. whether the generator output is configured as 525/59.94 or 625/50.

```
SUBMN:SDI-TSGx/PATTERN, select ◖◆◗
<Black> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to change the output signal pattern. Changes of the pattern are instantaneous, i.e. any changes are reflected immediately in the output signal
- When the desired pattern appears in the display, move the cursor to `SAVE` and press `E` to store the setting
- If no changes are desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the SDI-TSGx menu.

To change output signal system, select SYSTEM.

```
SUBMNU:../SDI-TSGx/SYSTEM, select ◖◆◗
SYSTEM:<NTSC> SAVE ESC
```

Operation:

- Use the ▲ and ▼ buttons to find the system setting you want. Changes of the system are instantaneous, i.e. that any changes are reflected immediately in the output signal.
- When the desired system appears in the display, move the cursor to `SAVE` and press `E` to change the system setting
- If no change is desired, move the cursor to ESC and press ▲

Leaving the function takes you back to the SDI-TPGx menu.

SDI signal system options:

- 525/59.94
- 625/50

Note: When changing from 625 to 525 lines you must check the timing adjustment. A valid 625 lines timing may NOT be valid in 525 lines. If the timing is not valid in 525 lines, then it will be reset.

To enable/disable insertion of EDH information in the SDI-SIGNAL, select EDH.

Operation:

```
SUBMNU:../SDI-TSGx/EDH, select ◂▴▸
EDH-INSERTION:<Off> SAVE ESC
```

- Use the ▴ and ▾ buttons to enable/disable insertion of EDH
- Enabling/disabling of the insertion of EDH is instantaneous, i.e. that any change is reflected immediately in the output signal
- When the desired function appears in the display, move the cursor to SAVE and press E to change the setting
- If no changes are desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the SDI-TSGx menu.

EDH insertion options:

- Off
- On

Setting the embedded audio generator

```
SUBMNU:SDI-TSGx/EMB.AUDIO, select ◂▴▸
2ND:<SIGNAL> LEVEL ESC
```

- Use the ◂ and ▸ buttons to select the parameter to change.
- Then press the ▾ to enter the selected 2nd menu.

To change the embedded audio on the SDI signal, select SIGNAL.

```
2NDMNU:../EMB.AUDIO-SIGNAL,select ◂▴▸
SIGNAL:<Stereo 1kHz> SAVE ESC
```

Operation:

- Use the ▴ and ▾ buttons to change the embedded audio signal. Change of the embedded audio is instantaneous, i.e. that any change is reflected immediately in the output signal
- When the desired audio signal appears in the display, move the cursor to SAVE and press E to change the setting.
- If no changes are desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the SDI-TSGx/EMB.AUDIO submenu.

Embedded audio options:

- Off
- Stereo 1 kHz

To change the embedded audio level, select LEVEL.

Operation:

- Use the ▴ and ▾ buttons to change the embedded audio level. Change of the embedded audio is instantaneous, i.e. that any change is reflected immediately in the output signal

```
2NDMNU:../EMB.AUDIO/LEVEL, select ◂▴▸
LEVEL:<0 dBFS> SAVE ESC
```

- When the desired embedded audio level appears in the display, move the cursor to SAVE and press E to change the setting
- If no change is desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the SDI-TPGx/EMB.AUDIO sub menu

SDI embedded audio level options:

- Silence
- 0 dBFS
- -9 dBFS
- -15 dBFS
- -18 dBFS

To change the delay/advance timing for the SDI-SIGNAL output, select TIMING.

```
MENU: SDI-TSGx/TIMING, edit delay ◂▴▸
v:<-1> H:+012 T:-00123.4 SAVE ESC
```

Operation:

- Use the ◂ or ▸ buttons to select V, H, or T
- Then use the ▴ and ▾ buttons to change the setting. Changes to the timing are instantaneous, i.e. any changes are reflected immediately in the output signal
- When the desired setting appears in the display, move the cursor to SAVE and press E to change the setting.

The timing can be adjusted by coarse or fine adjustment parameters. The coarsest adjustment is field (V), the finest is time (T), and line (H) is in between. The T value is in nanoseconds, with a resolution of approximately 37.5 ns.

- The T value can be changed by using the ▴ and ▾ buttons to adjust the smallest step for the adjustment, but a faster method is to press E , when the cursor is on the T value. This opens an editor in which each of the digits can be changed using the ▴ and ▾ buttons with resolution of 37.5 ns
- Positions are selected by using the ◂ and ▸ buttons
- To exit the editor press E
- When the desired delay setting appears in the display, move the cursor to SAVE and press E
- If no changes are desired, move the cursor to ESC and press ▴

Leaving the function takes you back to the SDI-TSGx menu.

```
PT5300 Dig.Video Gen.  Factory reset...
Selftest in progress...
```

```
PT5300 Dig.Video Gen.  Factory reset...
Internal test passed...
```

6.8 Reset

6.8.1 Factory Reset

The Factory Reset function resets all user-programmed parameters to the factory preset.

This function should not be used except in very unusual situations.

To execute the Factory Reset:

Turn ON the generator while pressing simultaneously the : ◂ and ▸ buttons

After the factory reset is done the following display will appear.

This message is shown for 1.5 seconds, and then the instrument proceeds to the normal startup.

The following parameters are reset to factory values:

Parameter:	**Factory value:**
AUTO ESCAPE	On
PANELLOCK	Off
NORMALLOCK	Off
DIAGNOSE LOCK	Off
RS232-INTERFACE	9600, 8, 1, NONE, XON/XOFF
LOCAL LOCK-OUT	Off (RS232 only)
CONTRAST	17 (middle contrast)

6.8.2 Menu: CONFIG/DIAGNOSE

The diagnose submenu is used to perform internal test of both the basic instrument and the optional installed modules. The output signals will be undisturbed during the standard diagnose routines.

```
SUBMNU:CONFIG/DIAGNOSE, select ◂▴▾▸E
SELECT:<Main> Options RS232 ...
```

```
SUBMNU:CONFIG/DIAGNOSE, select ◂▴▾▸E
SELECT:<Display> Keyboard Memory ...
```

```
SUBMNU:CONFIG/DIAGNOSE, select ◂▴▾▸E
SELECT:<Configuration> ErrorQueue ...
```

Use the ◂ and ▸ buttons to select the diagnose to be performed. Then press the E button to enter the submenu.

DIAGNOSE/Main

The MAIN test includes testing correct functioning of the functions installed in PT5300 without any options installed.

The tested functional sections includes:

- Main board
- Black Burst output 1 and 2
- Oscillator board.

```
2NDMNU:../DIAGNOSE/Main ▲
Testing main board >>>>>
```

All these tests are performed in a sequence.

Description:

When the test is running, this will be indicated by a number of arrows on the right side of the display. When a total of five arrows are displayed, the test is finished. If no errors have been found, a message OK will appear on the display to indicate that the test has been completed, otherwise the message FAIL will appear.

To continue testing on the next main section press the E button. To cancel further testing press the ▲ button.

```
2NDMNU:../DIAGNOSE/Main ▲
Testing black burst unit >>>>>
```

Description:

When the test is running, this will be indicated by a number of arrows on the right side of the display. When a total of five arrows are displayed, the test is finished. If no errors have been found, a message OK will appear on the display to indicate that the test has been completed, otherwise the message FAIL will appear.

To continue testing on the next main section press the E button. To cancel further testing, press the ▲ button.

Note: The Black Burst unit tested is the two standard included Black Burst generators.

```
2NDMNU:../DIAGNOSE/Main ▲
Testing oscillator board >>>>>
```

Description:

When the test is running, this will be indicated by a number of arrows on the right side of the display. When a total of five arrows are displayed, the test is finished. If no errors have been found, a message OK will appear on the display to indicate that the test has been completed, otherwise the message FAIL will appear.

To continue testing on the next main section press the E button. To cancel further testing, press the ▲ button.

To perform the main test once more, press the E button. To return to the previous menu level, press the ▲ button.

DIAGNOSE/Options

The OPTIONS test includes testing correct function of the optional installed modules in PT5300. The first testing of the installed option is started automatically when entering the menu. To continue with the next options press the E button. When all options have been tested use the ▲ button to return to the previous menu.

```
2NDMNU:../DIAGNOSE/Options ▲
Testing PTxxxx/yyy in (nnnn) >>>>>
```

Description:

This test is divided into a series of tests. Each of the options which where detected during power-up is detected for correct operation one by one.

When the test is running, this will be indicated by a number of arrows on the right side of the display. When a total of five arrows are displayed, the test is finished. If no errors have been found, a message OK will appear on the display to indicate that the test has been completed, otherwise the message FAIL will appear.

To continue testing on the next main section press the E button. To cancel further testing, press the ▲ button. During the test the display indicates which option is being tested. The syntax for the display is the following:

PTxxxx: indicates the type number for the option. PT8631 indicates that the PT 8631 Analog Test Pattern Generator is being tested.

yyy: indicates that the installed option is a special version option designed according to special requirements.

[nnnn]: indicates an optional parameter. This parameter identifies the output connector(s) the option is using. This parameter is required when several identical options are installed.

To repeat the test of all the option(s) press the E button. To return to the previous menu level, press the ▲ button.

Note: Options which where not detected during power up will not be tested.

DIAGNOSE/RS232

```
2NDMNU:../DIAGNOSE/RS232 ▲
Please insert a loopback connector!!
```

Description:

The RS232 port is tested using a loopback connector. This loopback connector is simply a connector where RxD (pin 2) is connected to TxD (pin 3), and RTS (pin 7) is connected to CTS (pin 8). When the test is running, this will be indicated by a number of arrows on the right side of the display. When a total of five arrows are displayed, the test is finished. If no errors have been found, a message OK will appear on the display to indicate that the test has been completed, otherwise the message FAIL will appear.

To continue testing on the next main section press the E button. To cancel further testing, press the ▲ button.

DIAGNOSE/Display

```
2NDMNU:../DIAGNOSE/Display ▲
abcdefghijklmnopqrstuvwxyz-1234567890+,.
```

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ_!#$%&/0=?;:
Abcdefghijklmnopqrstuvwxyz-1234567890+,.
```

Description:

This test will test the graphic display. During this test the above two displays will alternate with a frequency of approximately 1.6 seconds. The test is a visible test only. To return to the previous menu level press the ▲ button.

DIAGNOSE/Keyboard

```
2NDMNU:../DIAGNOSE/Keyboard ▲
Press button:  xxxxx >>>>>
```

Description:

The keyboard test is testing the response of the buttons on the front of the instrument. To perform the test press the button indicated.

The xxxxx will be replaced by a button name in the following sequence: LEFT, DOWN, RIGHT, EXECUTE, PRESET, OUTPUT, C.BAR, WINDOW, SPECIAL, LINEARITY and PATTERN.

The requested button has to be pressed within a given time. The arrows to the left in the display indicate the time to press the button, i.e. the button should be pressed before five arrows are visible.

The display will change as soon as the correct button has been pressed or a time-out occurs.

To restart the keyboard test press the E button. In case any time-out occurs the key will be marked as FAIL. To return to the previous menu level press the ▲ button.

Note: The ▲ is NOT tested. This test is performed by use of ▲ button when leaving the menu.

DIAGNOSE/Memory

```
2NDMNU:../DIAGNOSE/Memory ▲
Testing memory:  ROM >>>>>
```

Description:

There are two types of memory to test:

- ROM
- RAM

When the test is running, this will be indicated by a number of arrow on the right side of the display. When a total of five arrows are displayed, the test is finished. If no errors have been found, a message OK will appear on the display to indicate that the test has been completed, otherwise the message FAIL will appear. When the ROM has been tested the check sum is also displayed.

To continue testing on the next main section press the E button. To cancel further testing, press the ▲ button.

When both memory types have been tested a message stating the result of the complete test will appear.

The RAM check is done by writing and reading the sequence Ox55 and OxAA to/from each memory position in the RAM. Since this operation involves moving the content out of the RAM, there is a potential risk of loosing that data if the apparatus is switched off during the test. A built-in safety procedure will detect such an error during power-up and will report a general failure in the RAM. If this happens a factory reset will be performed.

To perform the main test once more, press the E button. To return to the previous menu level, press the ▲ button.

DIAGNOSE/Configuration

The Diagnose Configuration displays the units detected during power up. The identification may include type number (PTxxxx), Serial Number (KUxxxxxx), and when available the software version.

```
2NDMNU:../DIAGNOSE/Configuration ◀▲▶
(MAIN):PT5230, KUxxxxxx, 01.9 ESC
```

Description:

The main board is identified by the type number of the instrument (PT5300) and the serial number for the basic instrument. The software version is the software version of the master controller.

```
2NDMNU:../DIAGNOSE/Configuration ◀▲▶
(OSC):--,KUxxxxxx, 02.1 ESC
```

Description:

The oscillator board is identified by the serial number of the basic instrument and the software version of the oscillator board.

```
2NDMNU:../DIAGNOSE/Configuration ◀▲▶
(BB1):--,KUxxxxxx, 02.1 ESC
```

Description:

BB12	Indicates the two standard installed Black Burst generators. These two Black Burst generators are identified by the serial number of the basic instrument and the software version of the Black Burst generators
BB12	Indicates as well that the Black Burst generator uses output 1 and 2

Option PT 8631 Analog Test Pattern Generator

```
2NDMNU:../DIAGNOSE/Configuration ◀▲▶
(ATPG):PT8631, KUyyyyyy, 02.1 ESC
```

Description:

ATPGx	Indicates an optional installed PT 8631 Analog Test Pattern Generator. The PT 8631 Analog Test Pattern Generator is identified by the serial number and the software version of the option
ATPGx	Indicates as well that the module uses the output marked ANIL SITPGx x: denotes outputs 2 or 5

Option PT 8632 or PT8633 SDI SDI Test Pattern Generators

```
2NDMNU:../DIAGNOSE/Configuration ◂▸
(STPGx):PT8632, KUuuuuuu, 02.1 ESC
```

Description:

STPGx	Indicates an optional installed SDI Test Pattern Generator. The type number is PT 8632 or PT8633. The generator is also identified by the serial number and the software version STPGx
SDIS	Indicates as well that the module uses the two outputs marked SDI-TPGx

X: denotes outputs 1,2 or 5

Option PT 8605 AES/EBU Audio Generator

```
2NDMNU:../DIAGNOSE/Configuration ◂▸
(AES):PT8605, KU000000, NA ESC
```

Description:

AES	Indicates an optional installed PT 8635 AES/EBU Audio Generator. The PT 8605 AES/EBU Audio Generator is identified by the serial number. No software version is available for this option
AES	Indicates as well that the module uses the two outputs marked AES/EBU AUDIO (One XLR 11O Ω balanced and one BNC 75 Ω single ended output)

Option PT 8606 SDI Genlock module

```
2NDMNU:../DIAGNOSE/Configuration ◂▸
(SDIG):PT8606, KU000000, NA ESC
```

Description:

SDIG	Indicates an optional installed PT 8606 SDI Genlock module. The PT 8606 SDI Genlock module is identified by the serial number. No software version is available for this option
SDIG	Indicates as well that the module uses the two connectors marked SDI GENLOCK IN and OUT

Option PT 8637 Time Code Interface

```
2NDMNU:../DIAGNOSE/Configuration ◂▸
(TIME):PT8637, KU000000, NA ESC
```

Description:

TIME	Indicates an optional installed PT 8637 Time Code Interface. The PT 8637 Time Code Interface is identified by the serial number. No software version is available for this option
TIME	Indicates as well that the module uses the XLR connector marked TIME CODE

Option PT 8639 SDI Test Signal Generator

```
2NDMNU:../DIAGNOSE/Configuration ◂▸
(STPGx):PT8639, KU000000, 02.1 ESC
```

Description:

STPGx	Indicates any optional installed PT 8639 SDI Test Signal Generator. The PT 8639 SDI Test Signal Generators are identified by the serial number and the software version of the option
STPGx	Indicates as well that the module uses output marked SDI-TSGx

X: denotes outputs 2, 3 or 4

Note: The PT 8639 SDI Test Signal Generators will have different serial numbers and may have different software version.

DIAGNOSE/ErrorQueue

```
2NDMNU:../DIAGNOSE/ErrorQueue (1) ◂▴▸
E(006):Level detector at BB3 ESC
```

Description:

The errorqueue displays the history of detected internal errors including the hardware level detector circuits which surveys the output signals. The errorqueue stores the last detected five errors. The errors are numbered from 1 to 5 and may be scrolled by pressing the ▲ or the ▼ button. The detected error is identified by an error number and a describing text.

To leave the errorqueue unchanged, select ESC and press the ▲ button.

To reset the errorqueue, press the E button, then select OK and press the E button. The "WARNING" LED will be switched OFF.

```
2NDMNU:../DIAGNOSE/ErrorQueue ◂▴▸
Reset ErrorQueue?  OK <ESC>
```

Note: If any error is active, the error will be detected immediately again after reset and the "WARNING" LED will be switched ON again. The display is switched to the error status display.

Errorqueue is reset at power off/on

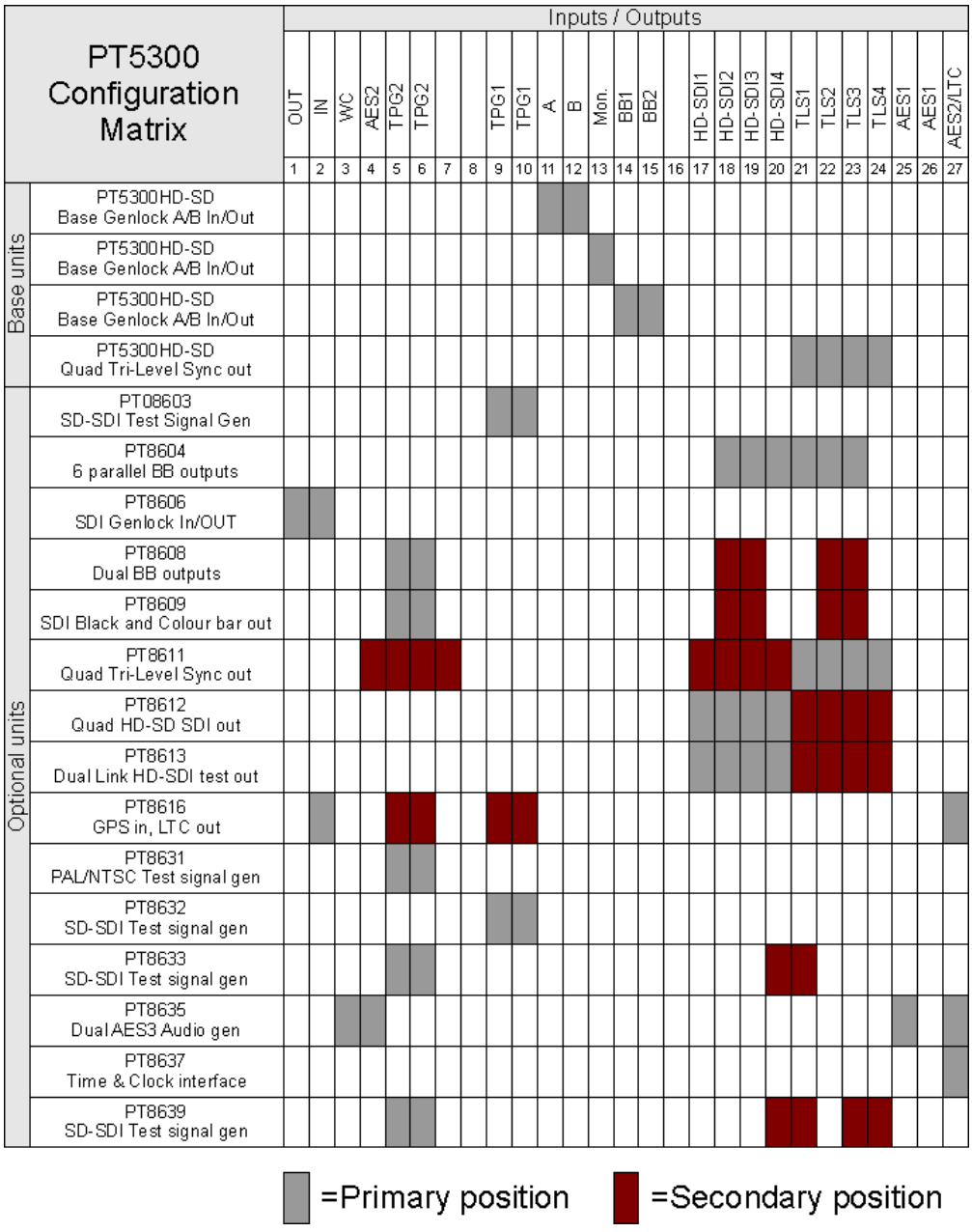

Figure 5: PT5300 Configurations

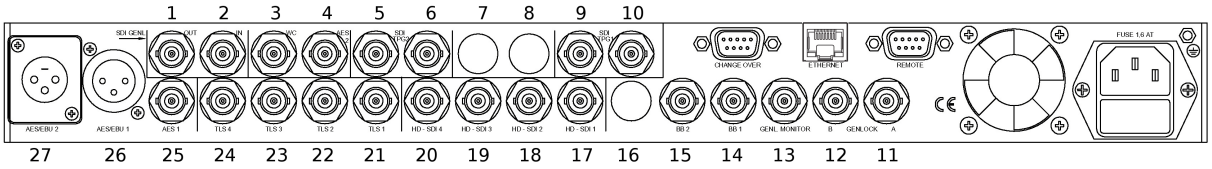

Figure 6: Rear Panel, Configuration

6.9 Menu Tree

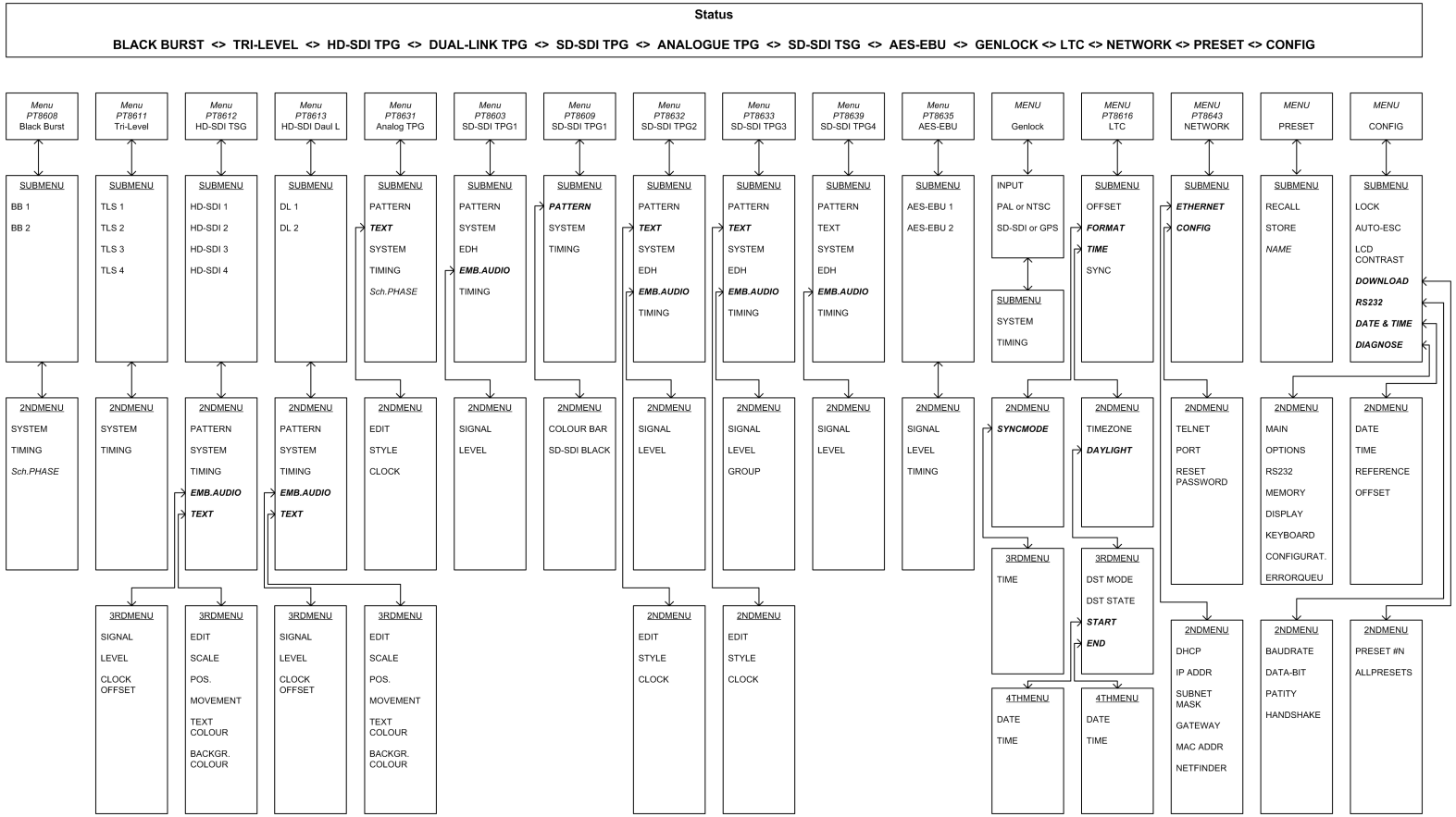

Figure 7: PT5300 Menu tree

7 Remote Interface

7.1 General Information

Two remote interfaces are standard in the instrument:

- A serial remote gives control over all the functions of the PT5300. The serial remote operates by use of an RS232 serial port.
- A Telnet interface (Ethernet) which gives control over all the functions of the PT5300. When the Telnet interface is operating the RS232 serial port is automatically disconnected.

ATTENTION!

It is strongly advised to change the default username and password for the Ethernet interface.

Please see section 10.3 for further information.

7.2 Serial Remote

The serial remote allows for control of virtually all functions in the generator as well as reading of instrument setting. The serial remote operates electrically as an RS232C communication port.

All functions can be controlled and checked by using the serial remote interface.

RS232 Settings.

Baud rate:	9600 Baud
Data bits:	8
Stop bits:	1
Parity:	None
Handshake:	XON/XOFF

The RS232 settings can not be changed.

Buffers

- Receive buffer: 64 bytes
- Transmit buffer: 32 bytes

Serial Port:

The 9-pin RS232 connector consists of:

Pin:	Name:	Description:
1	DCD	Not used
2	RxD	Receiver pin
3	TxD	Transmitter pin
4	DTR	Not used
5	SG	Signal ground
6	DSR	Not used
7	RTS	Request to send
8	CTS	Clear to send
9	RI	Not used

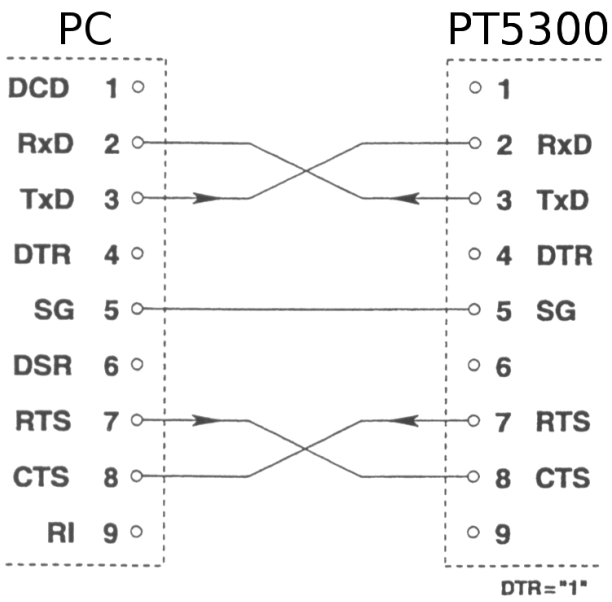

Figure 8: Configuration of cable between PC and PT5300

7.3 Telnet Remote

The Telnet remote allows for control of virtually all functions in the generator with the limitation that presets can not be up or downloaded using Telnet. When you connect to the PT5300 using a standard Telnet client you will be asked for a user name and a password. The user name and password is case sensitive. The default user name is **Admin** and the default password is **2730**.

7.4 General Description of the Interface Syntax

The PT5300 communication protocol complies with the:

- SCPI 1995.0: Standard Commands for Programmable Instruments, Vol I-IV. This protocol which is based on the IEEE 488.2 (IEEE Standard Codes, Formats, Protocols, and Common Commands).

For the description of the commands a basic knowledge of operation of the instrument is assumed.

To use the remote interface a basic knowledge of the SCPI programming and computer control is also recommended. The paper: "A beginner's Guide to SCPI" by Barry Epler, Hewlett-Packard Press ©, 1991 can be used to gain the basic knowledge of the ideas behind the SCPI system.

7.4.1 General Information

The remote system is organized in a tree structure. The structure defines sub-systems. In order to access command lower in the tree or in different branches the entire command string should be used. Indentation is used to indicate the root level and the branches. The highest level to the left. The complete command always includes all the root levels.

A space between a command string and an option is required, except in a query * where a space is not allowed.

Enter more than one command on a line by using a semicolon ";" as divider. A command line is terminated by <CR><LF>. If the next command is part of the same command system the separation is a ";" only. If the next command is part of another command system the ";" is followed by a ":".

Parameters are separated from the header by a space. Several parameters are separated by a comma.

Character strings should be placed in single or double quotation marks.

The valid parameter ranges are shown in the command tables. Non valid values generate an error message.

7.4.2 Syntax Elements

;	Semicolon separates two commands of a command line and does not change the path.
:	Colon separates the keywords of a command. In a command line, a colon ":" after a separating semicolon ";" indicates the root control level.
,	Comma separates the parameter command.
?	Question mark identifies a query command (Query commands are formed by adding a question mark to the header).
*	Asterisk identifies a common command. (Common commands consists of a header preceded by an asterisk and possibly followed by one or more parameters)
' or "	Single or double quote introduces and terminates a character string.
#	Double dagger introduces block data.
Space	Space Character separates header and parameters.
|	Parameters divided by a "|" indicates an "or" selection between the values shown. Only one value may be used at a time.
[xxxx]	Square brackets indicate an optional specific string parameter used by some command systems.
~~XXXX~~	A vertical line through a command indicates a command not implemented. The command is included for future compatibility reasons. The generator will not give any response to these command (error messages are not generated).

7.4.3 Command Syntax

A command consists of a "header" and one or several "parameters". Header and parameters are separated by space. A header may consist of several keywords.

7.4.4 Syntax of Program Messages

A command or query is called a program message unit. Such a program message unit consists of a header, or a header separated by a space from one or more parameters. The program header separator between the header and the first parameter must be at least one "whitespace" character. The header consists of one or more mnemonics (key words) describing the command. The parameters in a message unit are also referred to as "Data Elements". They are mutually separated by a comma (,), which is referred to as "Data Separator". Furthermore the following rules are valid:

- Any one of the "white space" characters (dec. 0..9, 11.. 32) may:
  - Precede a header
  - Precede the Message Terminator
  - Be placed in between the header and the parameter
  - Be placed in between two consecutive parameters
  - String data in a parameter must be specified between quotes. A quote may either be a
- 'single quote' (dec. 39) or a "double quote" character (dec. 34)

One or more program message units (commands) may be send within a single program message. Program message units are separated by a semicolon (;). A message of one or more units is terminated by a program message terminator.

The program message terminator must be the following code:

- LF <line feed> (dec.10) code

Note: Most controller programming languages send the terminator automatically, but allow it to be changed.

Basically there are two types of program headers:

- Compound headers - Commands have a compound header consisting of one of more key words (mnemonics), mutually separated by a colon (:) character. Such as a colon may also precede the header.
- Command headers - The program messages that are standardized are called common commands. Their headers always start with an asterisk (*) character

Each key word in a compound command header represents a node in the command tree. The left most key word is the root node, representing the highest hierarchical level in the command tree. Subsequent keyword represents sub nodes under the root node.

7.4.5 Long and Short Form

Program messages may be sent in either long or short form

- The long form is the full word
- The short form is the first character of the long form

The short form in a syntax specification is shown in upper case, and the remaining part of the long form is shown in lower case characters.

Note: Upper and lower case, as used in syntax specification, is only a notation habit to facilitate distinction between long and short form. The generator itself does not differentiate between upper and lower case characters. In program messages, either the long or short form may be used in any mix of upper or lower case characters. There is no semantic difference between upper and lower case in program messages.

7.4.6 Syntax of Response Messages

The response to a query is a response message unit, consisting of one or more parameters (data elements). Successive parameters are separated by a comma (,). If there are multiple queries in a program message, the multiple response message units are grouped together in the corresponding response message.

Response message units are separated by a semicolon (;) and are terminated by a response message terminator.

The instrument will always send the response data in short form and in capitals. Headers are not sent in the response messages, parameters only.

8 Command reference

8.1 Reference Documents

- IEEE 488.2-1987: IEEE Standard Codes, Formats, Protocols, and Common Commands
- SCPI 1995.0: Standard Commands for Programmable Instruments, Vol I-IV.
- "A Beginner's Guide to SCPI", Barry Epler, HEWLETT-PACKARD PRESS, 1991

8.2 Configuration and Syntax

Control characters:

Control character	Function
<Ctrl L> 0x0C	Local lockout switchover. Local lockout is **always** disabled after power-up
0x0A	Terminator, i.e. newline <LF>

PT8604 Multiple parallel Black Burst:

Multiple parallel Black Burst option is defined as BB2 when programming via RS232 except when requesting the version of the option. In this case a specific command exists.

8.3 Commands Summary

All commands listed consist of both a set- and request-command unless specifically listed in the table as <query only> or <no query>.

8.3.1 Mandated Commands

Command	Parameter	Status after *RST	Remarks
*CLS	-		Clear Status Command
*ESE			
*ESE?			
*ESR?			
*IDN?			Device Identification Query
*OPC			
*OPC?			
*RST			Reset Command
*SRE			
*SRE?			
*STB?			
*TST?			
*WAI			

8.3.2 Instrument Commands

DIAGnostic subsystem

Command	Parameter	Status after *RST	Remarks
:DISPlay	-		<no query>
:ERRorqueue			
:RESet	-	-	<no query>
:ERRorqueue	-	-	<query only>

DISPlay Subsystem

Command	Parameter	Status after *RST	Remarks
:CONTrast	<0 to 20> | MIN | MAX	16	

INPut Subsystem

Command	Parameter	Status after *RST	Remarks
:GENLock			

Command	Parameter	Status after *RST	Remarks
:INPut	A | B | A_B | SDI | INTernal | INTernal2	A	
:SYSTem	PALBurst | NTScburst | SYNC625 | SYNC525 | SDI625 | SDI525 | F358MHz | F443MHz | F5MHz | F10MHz	PALBurst	
:DElay	<Field>,<Line>,<HTime>	0,0,0	
:GENLock?	-	-	<query only>
:SDIGenlock			
:VERSion?	-		<query only>

OUTPut Subsystem

Command	Parameter	Status after *RST	Remarks
:BB1			
:SYSTem	PAL | PAL_ID | NTSC	PAL	
:DELay	<Field>,<Line>,<HTime>	0,0,0	
:SCHPhase	<179 to +180>	0	
:VERSion?	-	-	<query only>
:BB1?	-	-	<query only>
:BB2			
:SYSTem	PAL | PAL_ID | NTSC	PAL	
:DELay	<Field>,<Line>,<HTime>	0,0,0	
:SCHPhase	<179 to +180>	0	
:VERSion?	-	-	<query only>
:BB2?	-	-	<query only>
:ATPGenerator2			
:PATTerrn	<pattern_name>	CBEBu	
:MODify	OFF | ON		
:APAL	OFF | ON		
:PLUGe	OFF | ON		
:STAircase10	OFF | ON		
:TEXT			
STRing1	OFF | ON <string_data>	OFF,“ANALOG1” OFF,“PTV”	Standard Pattern Complex Pattern
STRing2	OFF | ON <string_data>	OFF,“ANALOG2” OFF,“PT5230”	Standard Pattern Complex Pattern

Command	Parameter	Status after *RST	Remarks
STRing3	OFF | ON <string_data>	OFF,“ANALOG3”	Standard Pattern
STYLe	STANdard | COMPlex	COMPlex	
CLOCk	OFF | TIME | DTIME	OFF	
:SYSTem	PAL | PAL_ID | NTSC	PAL	
:DELay	<Field>,<Line>,<HTime>	0,0,0	
:SCHPhase	<-179 to 180>	0	
:VERSion?	-	-	<query only>
:ATPGenerator2?	-	-	<query only>
:ATPGenerator5			
:PATTerrn	<pattern_name>	CBEBu	
:MODify	OFF | ON		
:APAL	OFF | ON		
:PLUGe	OFF | ON		
:STAircase10	OFF | ON		
:TEXT			
STRing1	OFF | ON <string_data>	OFF,“ANALOG1” OFF,“PTV”	Standard Pattern Complex Pattern
STRing2	OFF | ON <string_data>	OFF,“ANALOG2” OFF,“PT5230”	Standard Pattern Complex Pattern
STRing3	OFF | ON <string_data>	OFF,“ANALOG3”	Standard Pattern
STYLe	STANdard | COMPlex	COMPlex	
CLOCk	OFF | TIME | DTIME	OFF	
:SYSTem	PAL | PAL_ID | NTSC	PAL	
:DELay	<Field>,<Line>,<HTime>	0,0,0	
:SCHPhase	<-179 to 180>	0	
:VERSion?	-	-	<query only>
:ATPGenerator5?	-	-	<query only>
:STSGenerator2			
:PATTerrn	<pattern_name>	BLACk	
:SYSTem	SDI525 | SDI625	SDI625	
:DELay	<Field>,<Line>,<HTime>	0,0,0	
:EDHinsert	OFF | ON	OFF	
:EMBaudio	OFF | SILence	OFF	
:SIGNal	OFF | S1KHZ	OFF	

Command	Parameter	Status after *RST	Remarks
:LEVel	SILence | DB0FS | DB9FS | DB15FS | DB18FS	SILence	
:VERSion?	-	-	<query only>
:STSGenerator2?	-	-	<query only>
:STSGenerator3			
:PATTerrn	<pattern_name>	BLACk	
:SYSTem	SDI525 | SDI625	SDI625	
:DELay	<Field>,<Line>,<HTime>	0,0,0	
:EDHinsert	OFF | ON	OFF	
:EMBaudio	OFF | SILence	OFF	
:SIGNal	OFF | S1KHZ	OFF	
:LEVel	SILence | DB0FS | DB9FS | DB15FS | DB18FS	SILence	
:VERSion?	-	-	<query only>
:STSGenerator3	-	-	<query only>
:STSGenerator4			
:PATTerrn	<pattern_name>	BLACk	
:SYSTem	SDI525 | SDI625	SDI625	
:DELay	<Field>,<Line>,<HTime>	0,0,0	
:EDHinsert	OFF | ON	OFF	
:EMBaudio	OFF | SILence	OFF	
:SIGNal	OFF | S1KHZ	OFF	
:LEVel	SILence | DB0FS | DB9FS | DB15FS | DB18FS	SILence	
:VERSion?	-	-	<query only>
:STSGenerator4	-	-	<query only>
:STPGenerator1			
:PATTerrn	<pattern_name>	CBEBu	
:MODify	OFF | ON		
:APAL	OFF | ON	OFF	
:PLUGe	OFF | ON	OFF	
:STAircase10	OFF | ON	OFF	
MOTion	OFF | ON	OFF	
:TEXT			
STRing1	OFF | ON | <string_data>	OFF,“DIGITAL1” OFF,“PTV”	Standard Pattern Complex Pattern

Command	Parameter	Status after *RST	Remarks
STRing2	OFF | ON | <string_data>	OFF,"DIGITAL2" OFF,"PT5230"	Standard Pattern Complex Pattern
STRing3	OFF | ON | <string_data>	OFF,"DIGITAL3"	Standard Pattern
STYLe	STANdard | COMPlex	COMPlex	
CLOCk	OFF | TIME | DTIME	OFF	
:SYSTem	SDI525 | SDI625	SDI625	
:EDHinsert	OFF | ON	OFF	
:EMBaudio	OFF | SILence	OFF	
:SIGNal	OFF | S800HZ | S1KHZ | SEBu1KHz | SBBC1KHZ | MEBU1KHZ | M1KHZ | DUAL	OFF	
:LEVel	SILence | DB0FS | DB9FS | DB12FS | DB15FS | DB16FS | DB18FS | DB20FS	SILence	
:DELay	<Field>,<Line>,<HTime>	0,0,0	
:VERSion?	-	-	<query only>
:STPGenerator1?	-	-	<query only>
:STPGenerator2			
:PATTerrn	<pattern_name>	CBEBu	
:MODify	OFF | ON		
:APAL	OFF | ON	OFF	
:PLUGe	OFF | ON	OFF	
:STAircase10	OFF | ON	OFF	
MOTion	OFF | ON	OFF	
:TEXT			
STRing1	OFF | ON | <string_data>	OFF,"DIGITAL1" OFF,"PTV"	Standard Pattern Complex Pattern
STRing2	OFF | ON | <string_data>	OFF,"DIGITAL2" OFF,"PT5230"	Standard Pattern Complex Pattern
STRing3	OFF | ON | <string_data>	OFF,"DIGITAL3"	Standard Pattern
STYLe	STANdard | COMPlex	COMPlex	
CLOCk	OFF | TIME | DTIME	OFF	
:SYSTem	SDI525 | SDI625	SDI625	
:EDHinsert	OFF | ON	OFF	
:EMBaudio	OFF | SILence	OFF	
:SIGNal	OFF | S800HZ | S1KHZ | SEBu1KHz | SBBC1KHZ | MEBU1KHZ | M1KHZ | DUAL	OFF	

Command	Parameter	Status after *RST	Remarks
:LEVel	SILence | DB0FS | DB9FS | DB12FS | DB15FS | DB16FS | DB18FS | DB20FS	SILence	
:DELay	<Field>,<Line>,<HTime>	0,0,0	
:VERSion?	-	-	<query only>
:STPGenerator2?	-	-	<query only>
:STPGenerator5			
:PATTerrn	<pattern_name>	CBEBu	
:MODify	OFF | ON		
:APAL	OFF | ON	OFF	
:PLUGe	OFF | ON	OFF	
:STAircase10	OFF | ON	OFF	
MOTion	OFF | ON	OFF	
:TEXT			
STRing1	OFF | ON | <string_data>	OFF,"DIGITAL1" OFF,"PTV"	Standard Pattern Complex Pattern
STRing2	OFF | ON | <string_data>	OFF,"DIGITAL2" OFF,"PT5230"	Standard Pattern Complex Pattern
STRing3	OFF | ON | <string_data>	OFF,"DIGITAL3"	Standard Pattern
STYLe	STANdard | COMPlex	COMPlex	
CLOCk	OFF | TIME | DTIME	OFF	
:SYSTem	SDI525 | SDI625	SDI625	
:EDHinsert	OFF | ON	OFF	
:EMBaudio	OFF | SILence	OFF	
:SIGNal	OFF | S800HZ | S1KHZ | SEBu1KHz | SBBC1KHZ | MEBU1KHZ | M1KHZ | DUAL	OFF	
:LEVel	SILence | DB0FS | DB9FS | DB12FS | DB15FS | DB16FS | DB18FS | DB20FS	SILence	
:DELay	<Field>,<Line>,<HTime>	0,0,0	
:VERSion?	-	-	<query only>
:STPGenerator5?	-	-	<query only>
:AUDio1			
:SIGnal	S800Hz | S1kHz | SEBu1kHz | SBBc1kHz | MEBU1kHz | M1kHz | DUAL | F48kHz | WORDclock	S800Hz	
:LEVel	SILence | DB0FS | DB9FS | DB12FS | DB15FS | DB16FS | DB18FS | DB20FS	SILence	

Command	Parameter	Status after *RST	Remarks
:TIMing	PAL | NTSC1 | NTSC2 | NTSC3 | NTSC4 | NTSC5	PAL	
:VERSion?	-	-	<query only>
:AUDio1?	-	-	<query only>
:AUDio2			
:SIGnal	S800Hz | S1kHz | SEBu1kHz | SBBc1kHz | MEBU1kHz | M1kHz | DUAL | F48kHz | WORDclock	S800Hz	
:LEVel	SILence | DB0FS | DB9FS | DB12FS | DB15FS | DB16FS | DB18FS | DB20FS	SILence	
:TIMing	PAL | NTSC1 | NTSC2 | NTSC3 | NTSC4 | NTSC5	PAL	
:VERSion?	-	-	<query only>
:AUDio2?	-	-	<query only>
:TIMeclock			
:DFORmat	DMY | MDY | YMD	DMY	
:DATe	<year>,<month>,<date>	99,5,1	
:TFORmat	HOUR12 | HOUR24	HOUR24	
:TIMe	<hour>,<Minute>,<second>	8,0,0	
:REFerence	LTC | VITC | VFFRrequency | REF1HZ | INTernal	LTC	
:OFFSet	<offset>	0	
:VERSion?	-	-	<query only>
:TIMeclock?	-	-	<query only>
:TLG1-8			
:SYStem	OFF | HD1080P60 | HD1080P5994 | HD1080P50 | HD1080I30 | HD1080I2997 | HD1080I25 | HD1080P30 | HD1080P2997 | HD1080P25 | HD1080P24 | HD1080P2398 | HD1080sF30 | HD1080sF2997 | HD1080sF25 | HD1080sF24 | HD1080sF2398 | HD720P60 | HD720P5994 | HD720P50 | HD720P30 | HD720P2997 | HD720P25 | HD720P24 | HD720P2398		
:DELay	<Field>, <Line>, <HTime>		
:VERSion?	-	-	<query only>
:HD1-8			
:PATTern	BLACk | SDICheck | PLUGe | LRAMp | CLAPperbrd | COLOrbar | COMBInation | WINdow | CROSshatch | WHITe		

Command	Parameter	Status after *RST	Remarks
:MOD	HH | HS | SS, A105 | A100 | A95 | A90 | A85 | A80 | A75 | A70 | A65 | A60 | A55 | A50 | A45 | A40 | A35 | A30 | A25 | A20 | A15 | A10 | A5 | A0 | AM5		Applies only for certain patterns
:SYStem	OFF | HD1080I30 | HD1080I2997 | HD1080I25 | HD1080P30 | HD1080P2997 | HD1080P25 | HD1080P24 | HD1080P2398 | HD720P60 | HD720P5994 | HD720P50 | HD720P30 | HD720P2997 | HD720P25 | HD720P24 | HD720P2398 | SD525 | SD625		
:EMBaudio			
:SIGnal	SILence | SINE | CLICK | OFF		
:LEVel	DB0FS | DB6FS | DB12FS | DB18FS | DB24FS		
:CLIck	-499 to 500		
:TEXT			
:STRing1	"TEXT1"		
:STRing2	"TEXT2"		
:STRing3	"TEXT3"		
:MOVement	OFF | VERtical | HORizontal | BOTH		
:SCAle	1 to 4		
:COLor	WHIte | YELlow | CYAn | GREen | MAGenta | BLUe | BLAck		
:BACKground	WHIte | YELlow | CYAn | GREen | MAGenta | BLUe | BLAck		
:DELay	<Field>, <Line>, <HTime>		
:VERSion?	-	-	<query only>
:VERSion?	-	-	<query only>
:DL1-4			
:PATTern	BLACk | SDICheck | PLUGe | LRAMp | CLAPperbrd | COLOrbar | COMBInation | WINdow | CROSshatch | WHITe		
:MOD	HH | HS | SS, A105 | A100 | A95 | A90 | A85 | A80 | A75 | A70 | A65 | A60 | A55 | A50 | A45 | A40 | A35 | A30 | A25 | A20 | A15 | A10 | A5 | A0 | AM5		Applies only for certain patterns

Command	Parameter	Status after *RST	Remarks
:SYStem	OFF | HD1080I30 | HD1080I2997 | HD1080I25 | HD1080P30 | HD1080P2997 | HD1080P25 | HD1080P24 | HD1080P2398 | HD1080sF30 | HD1080sF2997 | HD1080sF25 | HD1080sF24 | HD1080sF2398 | HD720P60 | HD720P5994 | HD720P50 | HD720P30 | HD720P2997 | HD720P25 | HD720P24 | HD720P2398 | SD525 | SD625		
:INTERFace	I1 | I2 | I3 | I4 | I5 | I6		
:EMBaudio			
:SIGnal	SILence | SINE | CLICK | OFF		
:LEVel	DB0FS | DB6FS | DB12FS | DB18FS | DB24FS		
:CLIck	-499 to 500		
:TEXT			
:STRing1	"TEXT1"		
:STRing2	"TEXT2"		
:STRing3	"TEXT3"		
:MOVement	OFF | VERtical | HORizontal | BOTH		
:SCAle	1 to 4		
:COLor	WHIte | YELlow | CYAn | GREen | MAGenta | BLUe | BLAck		
:BACKground	WHIte | YELlow | CYAn | GREen | MAGenta | BLUe | BLAck		
:DELay	<Field>, <Line>, <HTime>		
:VERSion?	-	-	<query only>
:LTCGenerator1-2			
:FORMat	<Format>,<Syncmode>,<Hour>,<Min>		24FPS | 25FPS | 2997NOND | 2997DROP | 30FPS, NONE | CONF | AUTO, 0..23, 0..59
:OFFSET	-5000000..4999999		
:TIMEZone	<Hour>, <Min>		-11..+11, 0 | 30
:DAYLight			
:MODE	<Mode>, <State>		AUTO | CONF | AUTO, ON | OFF
:START	<Month>, <Day>, <Hour>		1..12, 1..31, 0..23
:END	<Month>, <Day>, <Hour>		1..12, 1..31, 0..23

8.4 Commands Explanation

8.4.1 Mandated Commands

***CLS CLEAR STATUS**
Clear the error queue. Reset of the event registers has NOT been implemented in this version.

***ESE STANDARD EVENT STATUS ENABLE COMMAND**
The device accepts this command but does not respond to it.

***ESE? STANDARD EVENT STATUS ENABLE QUERY**
The device accepts this command but does not respond to it.

***ESR? STANDARD EVENT STATUS REGISTER QUERY**
The device accepts this command but does not respond to it.

***IDN? IDENTIFICATION QUERY**
The response contains four fields:

- Field 1: Company name
- Field 2: Product name
- Field 3: Serial number (KUxxxxxxx)
- Field 4: Firmware level, i.e. software revisions for Mainboard-OSC

Example: **IDN? response: PTV,PT5230,KU123456,1.0-1.2*

***OPC OPERATION COMPLETE**
The device accepts this command but does not respond to it.

***OPC? OPERATION COMPLETE QUERY**
The device accepts this command but does not respond to it.

***RST RESET**
Resets the device to factory preset status. The six presets are NOT reset, i.e. any user preset will NOT be erased. The internal errorqueue and the SCPI errorqueue will also be reset. Finally the device and any optional units will be reset.

***SRE SERVICE REQUEST ENABLE**
The device accepts this command but does not respond to it.

***SRE? SERVICE REQUEST ENABLE QUERY**
The device accepts this command but does not respond to it.

***STB? READ STATUS BYTE QUERY**
The device accepts this command but does not respond to it.

***TST? SELF-TEST QUERY**
The device accepts this command but does not respond to it.

***WAI WAIT TO CONTINUE**
The device accepts this command but does not respond to it.

8.4.2 Required Commands

SYSTem commands

SYSTem:ERRor?
Command for reading an SCPI error message from the error queue. See Chapter 9 for a complete list of error codes.

Example:
SYST:ERR? response: -102,"Syntax error"

SYSTem:VERSion?
Command for reading the SCPI version to which the RS232 implementation complies.

Example:
SYST:VERS? response: 1995.0

SYSTem:PRESet[:RECall]
Command to recall a stored generator configuration from a preset. Six user presets from 1 to 6 are available.

Example:
SYST:PRES:REC 3
recall preset 3 in the generator

SYST:PRES:REC?
response: 3, i.e. preset 3 is currently active

SYSTem:PRESet:STORe
Command to store the actual configuration in a preset. Six user presets from 1 to 6 are available.

Example:
SYST:PRES:STOR 6
store configuration in preset 6

SYSTem:PRESet:NAMe
Command for naming a user preset. Six user presets from 1 to 6 are available. Number of characters in the name are limited to sixteen, 16.

Example:
SYST:PRES:NAME 2,"WHAT""
name preset number 2 "WHAT'

SYST:PRES:NAME? 2
response: "WHAT"

SYSTem:PRESet:DOWNload
Command for downloading, i.e. reading a complete preset from a PT5300 . Six user presets from 1 to 6 are available.

WARNING!

This command is currently not supported by the Telnet Interface.
Do not attempt to use it.

Example:
SYST:PRES:DOWN 4
download content of preset 4

SYSTem:PRESet:UPLoad
Command for downloading, i.e. reading a complete preset from a PT5300 . Six user presets from 1 to 6 are available.

WARNING!

This command is currently not supported by the Telnet Interface.
Do not attempt to use it.

Example:
SYST:PRES:UP 4, #aaa...
upload block data aaa to preset 4

SYSTem:DOWNload
Command for downloading, i.e. reading a complete PT5300 configuration incl. all presets.

> **WARNING!**
>
> This command is currently not supported by the Telnet Interface.
> Do not attempt to use it.

Example:
SYST:DOWN
download the complete PT5300

SYSTem:UPLoad
Command for uploading, i.e. storing a complete PT5300 configuration incl. all presets.

> **WARNING!**
>
> This command is currently not supported by the Telnet Interface.
> Do not attempt to use it.

Example:
SYST:UP #aaa...
upload block data aaa to PT5300

STATus commands

STATus:OPERaction[:EVENT]?
The device accepts this command but does not respond to it.

STATus:OPERation:CONDition?
The device accepts this command but does not respond to it.

STATus:OPERation:ENABle
The device accepts this command but does not respond to it.

STATus:QUEStionable[:EVENt]?
The device accepts this command but does not respond to it.

STATus: QUEStionable:CONDition?
The device accepts this command but does not respond to it.

STATus: QUEStionable:ENABle
The device accepts this command but does not respond to it.

STATus:PT5300?
Command to read the internal error status of the generator. If errors are detected use the command:

DIAGnostic:ERRorqueue?
to read the specific error.

Response Description:

"No errors"	No errors have occurred after power up.
"Active error"	The generator presently has an error.
"No active error"	The generator presently has no error, but one or more errors have been detected after power up.

Example:
STAT:PT5300?
response: "No active error"

8.4.3 Instrument Commands

DIAGnostic commands

DIAGnostic:DISPlay
The device accepts this command but does not respond to it.

DIAGnostic:ERRorqueue:RESet
Command to reset the internal error queue of the generator. The errorqueue is a circular queue consisting of five entries.

Example:
DIAG:ERR:RES
reset the five elements in the errorqueue

DIAGnostic:ERRorqueue?
Command to read an entry in the errorqueue and point to next entry in the errorqueue. This command should be executed five times to read the complete errorqueue.

Example:
DIAG:ERR?
response: -108,"Parameter not allowed"

DISPlay commands

DISPlay:CONTrast
The device accepts this command but does not respond to it.

INPut commands

INPut:GENLock:INPut
Command for selecting the genlock input. Possible selections are

Input:	Description:
A	A
B	B
A_B	A-B, i.e. loop through
SDI	SDI Genlock, (ONLY available with option PT 8606)
INTernal	Internal

When selecting a new input, the system for that particular input will apply.

Example:
INP:GENL:INP A_B
select input A/B as the genlock signal
INP:GENL:INP?
response: A_B

INPut:GENLock:SYSTem
Command for selecting the genlock system. Possible selections are

System:	A, B& A_B	SDI:	Description:
PALBurst	X		PAL burst lock
NTSCburst	X		NTSC burst lock
SYNC625	X		625 sync lock
SYNC525	X		525 sync lock
SDI625		X	625/50 lock
SDI525		X	525/59.95 lock
F358MHz	X		3.58 MHz lock
F443MHz	X		4.43 MHz lock
F5MHz	X		5 MHz lock
F10MHz	X		10 MHz lock

Note: When the input has been selected as Internal or Internal2, issuing this command will result in an error, namely: -200, "Execution error". This error will also occur if selecting a system which is invalid for the active input.

Example:
INP:GENL:SYST F358MHz
set system to 3.59 MHz clock
INP:GENL:SYST?
response: F358 MHz

INPut:GENLock:DELay Command to set the delay for the genlock input. The delay is defined by three parameters <Field>,<Line>,<HTime> where <Field> sets the field offset, <Line> sets the line offset and <HTime> sets the horizontal time in ns, i.e.

- HTime(PAL<64000.0ns
- HTime(NTSC)<63492.1ns

Note: It is not possible to select timing when the genlock system is 3.58 MHz, 4,43 MHz, 5 MHz, or 10 MHz or the input is set to internal or internal2. This will result in an execution error, namely: -200,"Execution error".

Also it is not possible to select a delay outside the range of the selected system. See table below:

Analogue				Digital			
PAL, 625 Lines		NTSC, 625 Lines		D1, 625 Lines		D1, 525 Lines	
Field:	Line:	Field:	Line:	Field:	Line:	Filed:	Line:
-3	-0,..,-312	-	-	-	-	-	-
-2	-0,..,-311	-	-	-	-	-	-
-1	-0,..,-312	-1	-0,..,-262	-	-	-	-
-0	-0,..,+311	-0	-0,..,-261	-0	-0,..,-312	-0	-0,..,-262
+0	+0,..,+312	+0	-0,..,+262	+0	+0,..,+311	+0	-0,..,+261
+1	+0..,+311	+1	-0,..,+261	+1	+0	+1	+0
+2	+0..,+312	+2	+0	-	-	-	-
+3	+0..,+311	-	-	-	-	-	-
+4	+0	-	-	-	-	-	-

Example:
INP:GENL:DEL+2,+5,+123.5
set delay to 2 field, 5 line & 123,5 ns
INP:GENL:DEL?
response: +2,+005,+00123.5

INPut:GENLock?
Command to display the status and the settings of the genlock. The respond is defined as: <lock info>,<input>,<system>,<Field>,<L
where <lock info> is either GENLOCKED or UNLOCKED.

For an explanation concerning the rest of the response see the commands:

INP:GENL:INP, INP:GENL:SYST and INP:GENL:DEL.

Note: The response will always return the above six parameters. But when selecting the input as INTERNAL the parameters <system>,<Field>,<Line>,<HTime> will have no meaning. Also when selecting the system as a timing, e.g. 3.58 MHz, the parameters <Field>,<Line>,<HTime> will have no meaning. In these cases the returned values should be discarded and only the relevant parameters should be used.

Example:
INP:GENL?
response: UNLOCKED,A,NTSCBURST,+1,212,00000.2
INP:GENL?
response: UNLOCKED,A,F358 MHz,+0,+0,+0
INP:GENL?
response: UNLOCKED,INTERNAL,NA, +0,+0,+0

INPut:SDIGenlock:VERSion?
Command to display the version of the optional PT 8606 SDI Genlock. The response contains four fields:

- Field 1: Company name

- Field 2: Type name
- Field 3: Serial number (KU number)
- Field 4: Not available for this option, i.e. the returned value is 0.

Example:
INP:SDIG:VERS?
Response: PTV,PT 8606,KU123456,0

OUTPut commands

OUTPut:BB1:SYSTem
OUTPut:BB2:SYSTem
Command to select the system of the standard Black Burst module. Systems available are:

System:	Description:
PAL	PAL
PAL_ID	PAL with line 7 pulse
NTSC	NTSC with setup

Example:
OUTP:BB1:SYSTPAL_ID
set system for BB module 1 to PAL with line 7 pulse
OUTP:BB1:SYST?
response: PAL_ID

OUTPut:BB1:DELay
OUTPut:BB2:DELay
Command to set the delay of the standard Black Burst module. The delay is defined by three parameters: <Field>,<Line>,<HTime> where <Field> sets the field offset, <Line> sets the line offset and <HTime> sets the horizontal time in ns, i.e.

- HTime(PAL)<64000.0ns
- HTime(NTSC)<63492.1ns

Note: It is not possible to select a delay outside the range of the selected system. See table below:

Analogue			
PAL, 625 Lines		NTSC, 625 Lines	
Field:	Line:	Field:	Line:
-3	-0,..,-312	-	-
-2	-0,..,-311	-	-
-1	-0,..,-312	-1	-0,..,-262
-0	-0,..,+311	-0	-0,..,-261
+0	+0,..,+312	+0	-0,..,+262
+1	+0..,+311	+1	-0,..,+261
+2	+0..,+312	+2	+0
+3	+0..,+311	-	-
+4	+0	-	-

Example:
OUTP:BB2:DEL-0,-0,-3245.2
set delay for BB module 2 to -2 field, -4 line & -3245.2ns
OUTP:BB2:DEL?
response: -2,-004,-03245.2

OUTPut:BB1:SCHPhase
OUTPut:BB2:SCHPhase

Command to set the ScH-Phase of the standard Black Burst module. The ScH-Phase value must be in the range: -179<ScH-Phase<=+180

Example:
OUTP:BB2:SCHP-160
set the ScHPhase for BB module 2 to -160deg
OUTP:BB2:SCHP?
response: -160

OUTPut:BB1:VERSion?
OUTPut:BB2:VERSion?
Command to display the version of the standard Black Burst module. The response contains four fields:

- Field 1: Company name
- Field 2: Type name, which in this case is NA, not available
- Field 3: Serial number (KUxxxxxx)
- Field 4: Software version for the Black Burst module

Note: The response from this command is identical for both BB module 1 and 2.

Example:
OUTP:BB1:VERS?
response: PTV,NA,KU123456,2.1

OUTPut:BB1?
OUTPut:BB2?
Command to display the complete settings of the standard Black Burst modules. The response contains five fields: <System>,<Field>,<Line>,<HTime>,<ScHPhase>

For an explanation of the response, see the commands:

OUTP:BBn:SYST,OUTP:BBn:DEL and OUTP:BBn:SCHP, where n:1 or 2

Example:
OUTP:BB1?
response: PAL,+2+123,+12345.5,-160

OUTPUT:ATPGenerator2:PATTern
OUTPUT:ATPGenerator5:PATTern
Command to select the pattern of an optional PT 8631 Analog Test Pattern Generator. Patterns available are:

Pattern:	PAL:	NTSC:	Description:
CBSMpte		X	SMPTE Colour Bar
CBEBu	X		EBU Colour Bar
CBFCc		X	FCC Colour Bar
CB100	X		100% Colour Bar
CBGRey75	X		Split field Colour bar w/75% grey
CBRed75	X		Split field Colourbar w/75% red
RED75	X	X	75% Red
LSWeep	X	X	Luminance sweep
MPULse	X	X	Multipulse
SINXx	X	X	Sinx/x
CCIR18	X		CCIR line 18
NCMB		X	NTC7 Combination
FCCMburst		X	FCC Multiburst
WIN15	X	X	Window 15%
WIN20	X	X	Window 20%
WIN100	X	X	Window 100%
GREy50	X	X	Grey 50%
WHITe100	X	X	White 100%
BLACkburst	X	X	Black Burst
FSWave	X	X	Field square wave
BLWH01	X	X	0.1Hz Black/white
RAMP	X	X	Ramp
MRAMp	X	X	Ramp Modulated
STAircase5	X	X	Staircase 5 step
MSTaircase5	X	X	Staircase 5 step modulated
STAircase10	X	X	Staircase 10 step
PBAR	X	X	Pulse & Bar
CCIR17	X		CCIR line 17
CCIR330	X		CCIR line 330
CCIR331	X		CCIR line 331
FCCComposite		X	FCC Composite
NCMP		X	NTC7 Composite
PHILips43	X		Philips pattern 4:3 format
PHILips169	X		Philips pattern 16:9 format
FUBK43	X		FuBK pattern 4:3 format
FUBK169	X		FuBK pattern 16:9 format
CROSshatch	X	X	Cross Hatch
CROSshatch169	X	X	Cross Hatch in 16:9
CIRCl43	X		White circle on black in 4:3
CIRCl169	X		White circle on black in 16:9
PLUGe	X	X	Pluge
SAFerea	X	X	Safe area
SWAVe250	X	X	Squarewave 250kHz
VMT01	X		VMT01 testpattern

Note: Not all the patterns are available in both systems. Trying to select a pattern not available in the active system will result in an error, namely: -200, "Execution error".

Example:
OUTP:ATPG2:PATT PHIL43
set the pattern in the ATPG module to PHILIPS 4:3
OUTP:ATPG2:PATT?
response: PHILIPS43

OUTPUT:ATPGenerator2:PATTern:MODify:APAL
OUTPUT:ATPGenerator2:PATTern:MODify:PLUGE
OUTPUT:ATPGenerator2:PATTern:MODify:STAircase10

OUTPUT:ATPGenerator5:PATTern:MODify:APAL
OUTPUT:ATPGenerator5:PATTern:MODify:PLUGE
OUTPUT:ATPGenerator5:PATTern:MODify:STAircase10
Commands to enable/disable a modification of a/the complex pattern in an optional PM8631 Analog test pattern Generator. The possible selections are OFF and ON.

Note: The above modification are only available when the Philips 4:3 pattern has been selected. Trying to modify any other pattern will result in an error, namely. -200, "Execution error".

Example:
OUTP:ATPG2:PATT:MOD:APAL OFF
remove anti-PAL from Philips pattern in the ATPG2
OUTP:ATPG2:MOD:APAL?
response: OFF

OUTPut:ATPGenerator2:TEXT:STRing1
OUTPut:ATPGenerator2:TEXT:STRing2
OUTPut:ATPGenerator2:TEXT:STRing3

OUTPut:ATPGenerator2:TEXT:STRing1
OUTPut:ATPGenerator2:TEXT:STRing2
OUTPut:ATPGenerator2:TEXT:STRing3
Command to insert one or more text strings into the pattern of the optional PT8631 Analog Test pattern Generator. Three parameters are possible, i.e. OFF, ON and some text, "TEXT". The string being edited depends upon the pattern selected. One group of patterns are the standard patterns, e.g. 75% Red, Colourbar etc. and another group is the complex pattern which is the Philips 4:3 pattern. The standard patterns will have three lines of text available, while the complex pattern only have two lines of text.

Note: To switch the text on/off use the parameters: ON or OFF. To alter the actual text: use "TEXT". The text is limited to sixteen characters.

Example:
OUTP:ATPG2:TEXT:STR1 "ANALOG"
set text line 1 in ATPG2 to ANALOG

OUTP:ATPG2:TEXT:STR1 ON
switch text in the pattern ON

OUTP: ATPG2:TEXT:TEXT?
response: ON,"ANALOG"

OUTPut:ATPGenerator2:TEXT:STYLe
OUTPut:ATPGenerator5:TEXT:STYLe
Command to select how the text is to be inserted into the Philips 4:3 pattern in the optional PT8631 Analog test Pattern generator. The possible selections are STANdard or COMPlex. When choosing the standard style, the two text lines will be placed in the lower right corner. When choosing the complex style, the text will be placed in the upper and lower text fields in the Philips pattern.

Note: This command is only available with the Philips 4:3 pattern. Attempting to use the command for any other pattern will result in an error, namely. -200, "Execution error".

Example:
OUTP:ATPG2:TEXT:STYL COMP
set text style in ATPG2 to complex

OUTP: ATPG2:TEXT:STYL?
response: COMPLEX

OUTPut:ATPGenerator2:TEXT:CLOCk
OUTPut:ATPGenerator5:TEXT: CLOCk
Command to insert time/date information into a pattern in the optional PT8631 Analog test Pattern The possible selections are:

	Description
OFF	No time- or date-information
TIMe	Time information
DTIMe	Time- and date-information

Note: This command requires the optional PT8637 Time Clock Interface to be present.

Example:
OUTP:ATPG5:TEXT:CLOC TIM
insert time int pattern in ATPG module5

OUTP: ATPG5:TEXT:CLOC?
response: TIME

OUTPut:ATPG2:SYSTem
OUTPut:ATPG5:SYSTem
Command to select the system of an optional PT 8631 Analog Test Pattern Generator. Systems available are:

System:	Description:
PAL	PAL
PAL_ID	PAL with line 7 pulse
NTSC	NTSC with setup

Note: If the pattern becomes invalid when selecting a new system, the pattern will change according to:

PAL specific patterns:	
EBU C.Bar	→ SMPTE C.Bar
100% C.Bar	→ SMPTE C.Bar
75% C.Bar+ Grey	→ SMPTE C.Bar
75% C.Bar+ Red	→ SMPTE C.Bar
CCIR Line 18	→ FCC Multiburst
CCIR Line 17	→ FCC Composite
CCIR line 330	→ FCC Composite
CCIR Line 331	→ FCC Composite
Philips 4:3	→ Crosshatch 4:3
VMT01	→ Crosshatch 4:3
NTSC specific patterns:	
SMPTE C.Bar	→ EBU C.Bar
FCC C.Bar	→ EBU C.Bar
NTC Combination	→ CCIR Line 18
FCC Multiburst	→ CCIR Line 18
FCC Composite	→ CCIR Line 17
NTC7 Composite	→ CCIR Line 17

Example:
OUTP:ATPG2:SYSTE PAL_ID
set the system in the generator to PAL with line 7 pulse

OUTP:ATPG2:SYST?
response: PAL_ID

OUTPut:ATPGenerator2:DELay
OUTPut:ATPGenerator5:DELay
Command to set the delay of an optional PT 8631 Analog Test Pattern Generator. The delay is defined by five parameters: <Field>,<Line>,<HTime>, where <Field> sets the field offset, <Line> sets the line offset and <HTime> sets the horizontal time in ns, i.e.

- HTime(PAL) <64000.0ns
- HTime(NTSC)<63492.1ns

Note: It is not possible to select a delay outside the range of the selected system. See table below:

Analogue			
PAL, 625 Lines		NTSC, 625 Lines	
Field:	Line:	Field:	Line:
-3	-0,..,-312	-	-
-2	-0,..,-311	-	-
-1	-0,..,-312	-1	-0,..,-262
-0	- 0,..,+311	-0	-0,..,-261
+0	+0,..,+312	+0	- 0,..,+262
+1	+0..,+311	+1	- 0,..,+261
+2	+0..,+312	+2	+0
+3	+0..,+311	-	-
+4	+0	-	-

Example:
OUTP:ATPG2:DeL -2,-4,-3245.2
set the delay in the generator to -2 field, -4 line & -3245.2ns

OUTP:ATPG2:DEL?
response:-2,-004,-03245.2

OUTPut:ATPGenerator2:SCHPhase
OUTPut:ATPGenerator5:SCHPhase
Command to set the ScH-Phase of an optional PT 8631 Analog Test Signal Generator. The ScH-Phase value must be in the range: -180<ScH-Phase<=+180

Example:
OUTP:ATPG2:SCHP -123
set the ScH-Phase in the generator to -123deg
OUTP:ATPG2:SCHP?
response: -123

OUTPut:ATPGenerator2:VERSion?
OUTPut:ATPGenerator5:VERSion?
Command to display the version of an optional PT 8631 Analog Test Pattern Generator. The response contains four fields:

- Field 1: Company name
- Field 2: Type name
- Field 3: KU number
- Field 4: Software version for the analog test pattern generator

Example:
OUTP:ATPG2:VERS?
response: PTV,PT8631,KU093456,1.0

OUTPut:ATPGenerator?
Command to display the complete settings of an optional PT 8631 Analog Test Pattern Generator. The response contains eight fields: <Pattern>, <Text insertion>, <System>, <Field>, <Line>, <HTime>, <ScHPhase>

For an explanation of the response, see the commands:

OUTP:ATPG2n:PATT, OUTP:ATPG2n:TEXT,OUTP:ATPG2n:SYST, OUTP:ATPGn:DEL, and OUTP:ATPGn:SCHP, where n: 2 or 5

Note: The field text insertion simply gives the information whether there is text or clock in the pattern selected, the text itself is NOT returned. The information about the the pattern modifications is not returned.

Example:
OUTP:ATPG2?
response: CBEBU,OFF,PAL,+2,+123,+12345

OUTPut:STGenerator2:PATTern
OUTPut:STGenerator3:PATTern
OUTPut:STGenerator4:PATTern
Command to select the pattern of an optional PT 8639 SDI Test Signal generator. Patterns available are:

Pattern:	SDI625:	SDI525:	Description:
CBSMpte		X	SMPTE Colour Bar
CBEBu	X		EBU Colour Bar
CBFCc		X	FCC Colour Bar
CBEBu8	X	X	EBU Colour Bar, ITU801
CB100	X		100% Colour Bar
CBRed75	X		75% C.Bar + Red
RED75	X	X	75% Red
MULTiburst	X	X	Multiburst
WIN15	X	X	Window 15%
WIN20	X	X	Window 20%
WIN100	X	X	Window 100%
GREy50	X	X	Grey 50%
BLACk	X	X	Black
SDICheck	X	X	SDI Check Field
DGRey	X	X	Digital Grey
STAircase5	X	X	Staircase 5 step
CROSshatch	X	X	Cross Hatch
PLUGe	X	X	Pluge

Note: Not all the patterns are available in both systems. Trying to select a pattern not available in the active system will result in an error, namely: -200,"Execution error"

Example:
OUTP:STSG3:PATT CSBM
set the pattern in STSG module 3 to SMPTE Colour Bar
OUTP: STSG3:PATT?
response: CBSMPTE

OUTPut:STSGenerator2:SYSTem
OUTPut:STSGenerator3:SYSTem
OUTPut:STSGenerator4:SYSTem
Command to select the pattern of an optional PT 8639 SDI Test signal Generator in the PT5300. Systems available are:

System:	Description:
SDI625	625/50 system
SDI525	525/59.94 system

Note: If the pattern becomes invalid when selecting a new system, the pattern will change according to:

625/50 specific patterns:
EBU C.Bar →SMPTE C.Bar
75% C.Bar+Grey→SMPTE C.Bar
525/59.94 specific patterns:
SMPTE C.Bar →EBU C.Bar
FCC C.Bar →EBU C.Bar

Example:
OUTP:STSG3:SYST SDI525
set the pattern in STSG module 3 to 525/59.94
OUTP: STSG3:SYST?
response: SDI525

OUTPut:STSGenerator2:DELay
OUTPut:STSGenerator3:DELay
OUTPut:STSGenerator4:DELay
Command to set the delay of an optional PT 8639 SDI Test Signal Generator. The delay is defined by three parameters: <Field>,<Line>,<HTime>, where <Field> sets the field offset, <Line> sets the line offset and <HTime> sets the horizontal time in ns, i.e.

- HTime(PAL)<64000.0ns
- HTime(NTSC)<63492.1ns

Note: It is not possible to select a delay outside the range of the selected system. See table below:

Digital			
D1, 625 Lines		D1, 525 Lines	
Field:	Line:	Field:	Line:
-0	-0,..,-312	-0	-0,..,-262
+0	+0,..,+311	+0	-0,..,+261
+1	+0	+1	+0

Example:
OUTP:STSG2:DEL+0,0312,+74.0
set the delay in STSG module 2 to +0 filed, +312 line & +74.0ns
OUTP:STSG2:DEL?
response: +0,+3122,+00074.2

OUTPut:STSG2:EDHinsert
OUTPut:STSG3:EDHinsert
OUTPut:STSG4:EDHinsert
Command to insert EDH into the output of an optional PT 8639 SDI Test Signal generator. Possible selections are ON or OFF.

Example:
OUTP: STSG2:EDH OFF
set the EDH insertion in STSG module 2 to OFF *OUTP: STSG2:EDH?*
response: OFF

OUTPut: STSG2:EMBaudio:SIGNal
OUTPut: STSG3:EMBaudio:SIGNal
OUTPut: STSG4:EMBaudio:SIGNal
Command to select the embedded audio signal in an optional PT 8639 SDI SDI Test Signal generator. Possible selections are:

Signal:	Description:
Off	Off
S1KHZ	Stereo 1 kHz

Example:
OUTP: STSG2:EMB:SIGN S1KHZ
set the embedded audio in STSG module 2 to stereo 1kHz
OUTP: STSG2:EMB:SIGN?
response: S1KHZ

OUTPut: STSG2:EMBaudio:LEVel
OUTPut: STSG3:EMBaudio:LEVel
OUTPut: STSG4:EMBaudio:LEVel
Command to select the embedded audio level in an optional PT 8639 SDI SDI Test Signal generator. Possible selections are:

Signal:	Description:
SILence	Silence
DB0FS	0 dB
DB9FS	-9 dB
DB15FS	-15 dB
DB18FS	-18 dB

Example:
OUTP: STSG2:EMB:LEV DB0FS
set the embedded audio level in STSG module 2 to 0 dB
OUTP: STSG2:EMB:LEV?
response: DB0FS

OUTPut:STSG2:VERSion?
OUTPut: STSG3:VERSion?
OUTPut: STSG4:VERSion?
Command to display the version of an optional PT8639 SDI Test signal Generator. The response contains four fields:

- Field 1: Company name
- Field 2: Type name
- Field 3: KU number
- Field 4: Software version for the PT 8639 SDI Test Signal Generator

Example:
<OUTP: STSG4:VERS?
response: PTV,PT8639,KU123456,2.0

OUTPut: STSG2?
OUTPut: STSG3?
OUTPut: STSG4?
Command to display the complete settings of an optional PT 8639 SDI Test Signal Generator. The response contains eight fields: <Pattern>, <System>, <Field>, <Line>, <HTime>, <EDH>, <Audio signal>, <Audio level>.

For an explanation of the response, see the commands:

OUTP:STSG n:PATT, OUTP:STSGn:SYST, OUTP:STSGn:DeL, OUTP:STSGn:EDH, OUTP:STSGn:EMB:SIGN and OUTP:STSGn:EMB:LEV, where n: 2, 3, or 4.

Example:
OUTP:STSG4?
response:CBEBU,SDI625,+0,+001,+12345.5,OFF,OFF,SIL

OUTPut:STPGenerator1:PATTern
OUTPut:STPGenerator2:PATTern
OUTPut:STPGenerator3:PATTern
Command to select the pattern of an optional PT8632 and PT8633 SDI Test Pattern Generators. Patterns available are:

Pattern:	PT8632		PT8633		Description:
	525 line	625 line	525 line	625 line	
CBSMpte		X			SMPTE C.Bar
CBEBu		X		X	EBU C.Bar
CBFCc	X		X		FCC C.Bar
DBEBu8	X	X	X	X	EBU C.Bar 8 bit
CB100	X				100% C.Bar
CBGRey75	X				Split field C.Bar +75% grey
CBRed75		X		X	Split field C.Bar +75% red
RED75	X	X	X	X	75% Red
MULTiburst	X	X	X	X	Multiburst
LSWeep	X	X	X	X	Luminance sweep
YCRCbsweep			X	X	Y, Cr, Cb sweep
MPULse	X	X	X	X	Multipulse
SINXx			X	X	Sinx/x
WIN15	X	X			Window 15%
WIN20	X	X			Window 20%
WIN100	X	X			Window 100%
WHITe100			X	X	White 100%
BLACk	X	X	X	X	Black
SDICheck	X	X	X	X	SDI Check Field
DTIMing	X	X	X	X	Digital timing
FDTest	X	X	X	X	Field Delay test
BOWTie	X	X	X	X	Bow Tie
ABLanking	X	X	X	X	Analog Blanking
DGRey	X	X	X	X	Digital Grey
FSWave	X	X	X	X	Field Square wave
BLWH01			X	X	0.1 Hz Bl/Wh
EOLine			X	X	End of line
WEOLine			X	X	White end of line
BEOLine			X	X	Blue end of line
REOLine			X	X	Red end of line
YEOLine			X	X	Yellow end of line
CEOLine			X	X	Cyan end of line
SRAMP	X	X	X	X	Shallow ramp
RAMP	X	X	X	X	Ramp
LRAMp	X	X	X	X	Limit Ramp
VRAMp	X	X	X	X	Valid Ramp
CCIR17				X	CCIR line 17
CCIR18				X	CCIR line 18
CCIR330				X	CCIR line 330
CCIR331				X	CCIR line 331
STAircase5	X	X	X	X	Staircase 5 step
MSTaircase5	X	X	X	X	Staircase 5 step, modulated
STAircase10			X	X	Staircase 10 step
PBAR	X	X	X	X	Pulse & Bar
YGRamp			X	X	Ramp Yellow/Grey
GBRamp			X	X	Ramp Grey/Blue
CGRamp			X	X	Ramp Cyan/Grey
GRRamp			X	X	Ramp Grey/Red
CBYCramp			X	X	Ramp Cb, CR, Y
PHILips43			X	X	Philips pattern in 4:3 format
PHILips169			X	X	Philips pattern in 16:9 format
FUBK43			X	X	FuBK pattern in 4:3 format
FUBK169			X	X	FuBK pattern in 16:9 format
CROSshatch	X	X	X	X	Cross hatch
PLUGe	X	X	X	X	Pluge
SAFarea	X	X	X	X	Safe area
VNT01			X	X	VMT01

Note: Not all the patterns are available in both systems. Trying to select a pattern not available in the active system will result in an error, namely: -200,"Execution error"

Example:
OUTP:STPG2:PATT WIN15
set the pattern in the STPG module to window 15%
OUP:STPG2:PATT?
response: WIN15

OUTPUT:STPGenerator1:PATTern:MODify:APAL
OUTPUT:STPGenerator1:PATTern:MODify:PLUGe
OUTPUT:STPGenerator1:PATTern:MODify:STAircase10
OUTPUT:STPGenerator1:PATTern:MODify:MOTion

OUTPUT:STPGenerator2:PATTern:MODify:APAL
OUTPUT:STPGenerator2:PATTern:MODify:PLUGe
OUTPUT:STPGenerator2:PATTern:MODify:STAircase10
OUTPUT:STPGenerator2:PATTern:MODify:MOTion
OUTPUT:STPGenerator2:PATTern:MODify:CIRCles

OUTPUT:STPGenerator5:PATTern:MODify:APAL
OUTPUT:STPGenerator5:PATTern:MODify:PLUGe
OUTPUT:STPGenerator5:PATTern:MODify:STAircase10
OUTPUT:STPGenerator5:PATTern:MODify:MOTion
OUTPUT:STPGenerator5:PATTern:MODify:CIRCles
Commands to enable/disable the modifications of a complex pattern in an optional PT8632 and PT8633 SDI test Pattern Generator in the PT5230. The possible selections are: OFF and ON.

Note: The above modifications are only available when a Philips or FuBK pattern has been selected. Trying to select a pattern will result in an error, namely: -200,"Execution error"

Example:
OUTP:STPG2:PATT:MOD:APAL OFF
remove anti-PAL from a complex pattern in STPG module 2
OUP:STPG2:PATT: MOD:APAL?
response: OFF

OUTPut:STPGenerator1:TEXT:STRing1
OUTPut:STPGenerator1:TEXT:STRing2
OUTPut:STPGenerator1:TEXT:STRing3

OUTPut:STPGenerator2:TEXT:STRing1
OUTPut:STPGenerator2:TEXT:STRing2
OUTPut:STPGenerator2:TEXT:STRing3

OUTPut:STPGenerator5:TEXT:STRing1
OUTPut:STPGenerator5:TEXT:STRing2
OUTPut:STPGenerator5:TEXT:STRing3
Command to insert one or more text strings into the pattern of the optional PT8632 and PT8633 SDI Test pattern Generator. Three parameters are possible, i.e. OFF, ON and some text, "TEXT". The string being edited depends upon the pattern selected. One group of patterns are the standard patterns, e.g. 75% Red, Colourbar etc. and another group is the complex pattern which is the Philips 4:3 pattern. The standard patterns will have three lines of text available, while the complex pattern only have two lines of text.

Note: To switch the text on/off use the parameters: ON or OFF. To alter the actual text: use "TEXT". The text is limited to sixteen characters.

Example:
OUTP:STPG2:TEXT:STR1 "HI THERE!"
set text line 1 in STPG2 to HI THERE!
OUTP:STPG2:TEXT:STR1 ON
switch text in the pattern ON
OUTP: STPG2:TEXT:TEXT?
response: ON,"HI THERE!"

OUTPut:STPGenerator1:TEXT:STYLe
OUTPut:STPGenerator2:TEXT:STYLe
OUTPut:STPGenerator5:TEXT:STYLe
Command to select how the text is to be inserted into the Philips 4:3 pattern in the optional PT8632 and PT8633 SDI Test Pattern generator. The possible selections are STANdard or COMPlex. When choosing the standard style, the two text lines will be placed in the lower right corner. When choosing the complex style, the text will be placed in the upper and lower text fields in the Philips pattern, and in the left and right text field for the FuBK pattern.

Note: This command is only available with the Philips or FuBK patterns. Attempting to use the command for any other pattern will result in an error, namely. -200, "Execution error".

Example:
OUTP:STPG2:TEXT:STYL COMP
set text style in STPG2 to complex
OUTP: STPG2:TEXT:STYL?
response: COMPLEX

OUTPut:STPGenerator1:TEXT:CLOCk
OUTPut:STPGenerator2:TEXT:CLOCk
OUTPut:STPGenerator5:TEXT: CLOCk
Command to insert time/date information into a pattern in the optional PT8632 or PT8633 SDI Test Pattern generators. The possible selections are:

Signal:	**Description:**
	Description
OFF	No time- or date-information
TIMe	Time information
DTIMe	Time- and date-information

Note: This command requires the optional PT8637 Time Clock Interface to be present.

Example:
OUTP:STPG1:TEXT:CLOC TIM
insert time into the pattern in ATPG module1
OUTP: STPG1:TEXT:CLOC?
response: TIME

OUTPut:STPGenerator1:SYSTem
OUTPut:STPGenerator2:SYSTem
OUTPut:STPGenerator5:SYSTem
Command to select the system of an optional PT 8632 and PT8633 SDI Test Pattern Generators. Systems available are:

System:	Description:
SDI625	625/50 system
Sdi525	525/59.94 system

Note: If the pattern becomes invalid when selecting a new system, the pattern will change according to:

625/50 specific patterns:	
EBU C.Bar	→SMPTE C.Bar
75% C.Bar+Grey	→SMPTE C.Bar
75% C.BAR+Red	→SMPTE C.Bar
Philips 4:3	→Crosshatch (only for PT8632)
FuBK 4:3	→Philips 4:3
FuBK 16:9	→Philips 16:9
VMT01	→Crosshatch
525/59.94 specific patterns:	
SMPTE C.Bar	→EBU C.Bar
FCC C.Bar	→EBU C.Bar

Example:
OUTP:STPG2:SYST SDI625

set the system in STPG module to 625/50
OUTP: STPG2:SYST?
response: SDI625

OUTPut:STPGenerator1:EDHinsert
OUTPut:STPGenerator2:EDHinsert
OUTPut:STPGenerator5:EDHinsert
Command to select the pattern of an optional PT 8632 or PT8633 SDI Test Pattern Generator in the PT5300 . Possible selections are ON or OFF.

Example:
OUTP:STPG2:EDH OFF
set EDH insertion in STPG module 2 to OFF
OUTP: STPG2:EDH? response: OFF

OUTPut:STPGenerator1:EMBaudio:SIGNal
OUTPut:STPGenerator2:EMBaudio:SIGNal
OUTPut:STPGenerator5:EMBaudio:SIGNal
Command to select the signal of the embedded audio in an optional PT 8632 and PT8633 SDI Test Pattern Generator in the PT5300. Possible selections are:

System:	Description:
OFF	Off
S800HZ	Stereo 800 Hz
S1KHZ	Stereo 1 kHz
SEBu1KHZ EBU	Stereo 1kHz
SBBC1KHZ BBC	Stereo 1 kHz
MEBu1KHZ EBU	Mono 1 kHz
M1KHZ	Mono 1 kHz
DUAL	Dual Sound

Example:
OUTP:STPG1:EMB:SIGN S1KHZ set the embedded audio signal in STPG module 1 to stereo 1kHz
OUTP: STPG1:EMB:SIGN?
response: S1KHZ

OUTPut:STPGenerator1:EMBaudio:LEVel
OUTPut:STPGenerator2:EMBaudio:LEVel
OUTPut:STPGenerator5:EMBaudio:LEVel
Command to select the level of the embedded audio in an optional PT 8632 and PT8633 SDI Test Pattern Generator in the PT5300. Possible selections are:

System:	Description:
SILence	Silence
DB0FS	0 dB
DB9FS	-9 dB
DB12FS	-12 dB
DB15FS	-15 dB
DB16FS	-16 dB
DB18FS	-18 dB
DB20FS	-20 dB

Example:
OUTP:STPG1:EMB:LEV DB0FS
set the embedded audio signal in STPG module 1 to 0dB
OUTP: STPG1:EMB:LEV?
response: DB0FS

OUTPut:STPGenerator1:EMBaudio:GROup
OUTPut:STPGenerator2:EMBaudio GROup
OUTPut:STPGenerator5:EMBaudio: GROup
Command to select the level of the embedded audio group in an optional PT8633 SDI Test Pattern Generator. Possible selections are:

Group:	Description:
GROup1	Audio Group 1
GROup2	Audio Group 2
GROup3	Audio Group 3
GROup4	Audio Group 4

Example:
OUTP:STPG1:EMB:GRO GRO3
set the embedded audio group in STPG module 1 to group3
OUTP: STPG1:EMB: GRO?
response: GROUP3

OUTPut:STPGenerator1:DELay
OUTPut:STPGenerator2:DELay
OUTPut:STPGenerator5:DELay
Command to set the delay of an optional PT 8632 and PT8633 SDI Test Pattern Generator. The delay is defined by three parameters: <Field>,<Line>,<HTime>, where <Field> sets the field offset, <Line> sets the line offset and <HTime> sets the horizontal time in ns, i.e.

- HTime(PAL) <64000.0ns
- HTime(NTSC) <63492.1ns

Note: It is not possible to select a delay outside the range of the selected system. See table below:

Analogue			
PAL, 625 Lines		NTSC, 625 Lines	
Field:	Line:	Field:	Line:
-0	-0,..,-312	-0	-0,..,-262
+0	+0,..,+311	+0	-0,..,+261
+1	+0	+1	+0

Example:
OUTP:STPG1:DEL-0,-12,-148.0 set the delay in STPG module 1 to -0 field, -12 line & -148.0 ns
OUTP:STPG1:DeL?
response:-0,-012,-00148.0

OUTPut:STPGenerator1:VERSion?
OUTPut:STPGenerator2:VERSion?
OUTPut:STPGenerator5:VERSion?
Command to display the version of an optional PT8632 or PT8633 SDI Test Pattern Generator. The response contains four fields:

- Field 1: Company name
- Field 2: Type name
- Field 3: Serial number (KUxxxxxx)
- Field 4: Software version for the PT 8632 or PT8633 SDI Test Signal Generator

Example:
OUTP:STPG1:VERS?
response: PTV,PT8632,KU123456,2.0

OUTPut:STPGenerator1?
OUTPut:STPGenerator2?
OUTPut:STPGenerator5?
Command to display the complete setting of an optional PT 8632 or PT8633 SDI Test Pattern Generator. The response contains ten fields:

<Pattern>, <Text insertion>, <System>, <EDH>, <Audio signal>, <Audio level>, <Audio group>, <Field>, <Line>, <Ftime>.

For an explanation of the response, see the commands:

OUTP:STPGn:PATT, OUTP:STPGn:TEXT, OUTP:STPGn:SYST, OUTP:STPGn:EDH, OUTP:STPGn:EMB:SIGN, OUTP:STPGn:EMB:LEV, OUTP:STPGn:EMB:GRO and OUTP:STPGn:Del, where n: 1, 2 or 5

Example:
OUTP:STPG2?
response:
CBEBU,OFF,"DIGITAL",SDI625,OFF,DUAL,DBM9FS GROUP1,+0,+001,+12345.5

OUTPut:AUDio1:SIGNal
OUTPut:AUDio2:SIGNal
Command to select the audio signal in an optional PT 8635 Dual AES/EBU Audio Generator. Possible selections are:

System:	Description:
S800HZ	Stereo 800 Hz
S1KHZ	Stereo 1 kHz
SEBu1KHZ	EBU Stereo 1kHz
SBBC1KHZ	BBC Stereo 1 kHz
MEBu1KHZ	EBU Mono 1 kHz
M1KHZ	Mono 1 kHz
DUAL	Dual Sound
F48KHZ	Wordclock (48 kHz)

Example:
OUTP:AUD1:SIGN DUAL
set the audio signal in the generator to dual sound
OUTP:AUD1:SIGN?
response: DUAL

OUTPut:AUDio1:LEVel
Command to select the audio level in an optional PT 8635 Dual AES/EBU Audio Generator. Possible selections are:

Signal:	Description:
SILence	Silence
DB0FS	0 dB
DB9FS	-9 dB
DB12FS	-12 dB
DB15FS	-15 dB
DB16FS	-16 dB
DB18FS	-18 dB
DB20FS	-20 dB

Example:
OUTP:AUD1:LEV DB20FS
set the audio level in the generator to -20 dB
OUTP:AUD1:LEV?
response: DB20FS

OUTPut:AUDio1:TIMing
Command to select the audio timing in an optional PT 8635 Dual AES/EBU Audio Generator. Possible selections are:

Signal:	Description:
PAL	
NTSC1	Phase AES0
NTSC2	Phase AES1
NTSC3	Phase AES2
NTSC4	Phase AES3
NTSC5	Phase AES4

Example:
OUTP:AUD1:TIM NTSC3
set the audio timing in the generator to NTSC3 *OUTP:AUD1:TIM?*
response: NTSC3

OUTPut:AUDio1:VERSion? Command to display the version of an optional PT 8635 Dual AES&EBU Audio Generator. The response contains four fields:

- Field 1: Company name
- Field 2: Type name
- Field 3: Serial number (KUxxxxxx)
- Field 4: Not available for this option, i.e. the returned value is 0.

Example:
OUTP:AUD1:VERS?
response: PTV,PT8635,KU123456,2.0

OUTPut:AUDio1?
Command to display the complete settings of an optional PT 8635 Dual AES/EBU Audio Generator The response contains three fields: <Signal>,<Level>,<Timing>.

For an explanation of the response, see the commands:

OUTP:AUDn:SIGN, OTUP:AUDn:LEV and OUTP:AUDn:TIM, where n is 1 or 2.

Example:
OUTP:AUD1?
response: DUAL, SILENCE, NTSC3

OUTPut:TIMeclock:DFORmat
Command to set the date of an optional PT8637 Time Clock Interface in the PT5230. Possible selections are: DMY, MDY and YMD.

Example:
OUTP:TIM:DFOR MDY
select displaying date as month, date, year
OUTP:TIM:DFOR?
response: MDY

OUTPut:TIMeclock:DATe
Command to set the date of an optional PT8637 Time Clock Interface. The date must be entered as three numeric parameters separated by commas. The parameter must be entered as year, month, date. Entering an illegal date will result in error, namely: -200,"Execution error"

Example:
OUTP:TIM:DAT 05,12,2
set the date to 2nd December 2005
OUTP:TIM:DAT?
response: 05,12.2

OUTPut:TIMeclock:TFORmat
Command to set the date of an optional PT8637 Time Clock Interface. Possible selections are: HOUR12 and HOUR24. Entering an illegal date will result in error, namely: -200,"Execution error"

Example:
OUTP:TIM:TFOR HOUR12
select 12 hour date format
OUTP:TIM:TFOR?
response: HOUR12

OUTPut:TIMeclock:TIMe
Command to set the time of an optional PT8637 Time Clock Interface. The date must be entered as three

numeric parameters separated by commas. The parameter must be entered as hour, minute, second. Entering an illegal time will result in error, namely: -200,"Execution error"

Example:
OUTP:TIM:TIM 08,34,12
set time to 08:34:12, i.e. 34 minutes past 8 o'clock
OUTP:TIM:TIM?
response: 8,34,12

OUTPut:TIMeclock:REFerence
Command to set the reference of an optional PT8637 Time Clock Interface. Possible selections are:

Signal:	Description:
LTC	LTC on XLR input
VITC	VITC on genlock signal
VFFRequency	Video Field frequency
REF1HZ	1 HZ pulse
INTernal	Internal

Example:
OUTP:TIM:REF VITC
selects VITC
OUTP:TIM: REF?
response: VITC

OUTPut:TIMeclock:OFFSet
Command to set time offset of an optional PT8637 Time Clock Interface.

Example:
OUTP:TIM:TIM:OFFS 0.3
set time offset to +0.3 second
OUTP:TIM:OFFS?
response: 0.3

OUTPut:TIMeclock:VERSion?
Command to display the version of an optional PT 86037 Time Code Interface. The response contains four fields:

- Field 1: Company name
- Field 2: Type name
- Field 3: Serial number (KUxxxxxx)
- Field 4: Not available for this option, i.e. the returned value is 0.

Example:
OUTP:TIM:VERS?
response: PTV,PT8637,KU123456,0

OUTPut:TIMeclock?
Command to display the complete setting of an optional PT 8637 Time Clock Interface. The response contains six (ten) fields: <Date format>,<Date>,<Time format>,<Time>,<Reference>,<Offset>.

For an explanation of the response, see the commands:

OUTP:TIM:DFOR, OUTP:TIM:DAT, OUTP:TIM:TFOR, OUTP:TIM:TIM, OUTP:TIM:REF, OUTP:TIM:OFFS.

Note: Due to that the response of date and time returns 3 values (both), then the response contains 10 fields.

Example:
OUTP:TIM:? response: MDY,12,12,98,HOUR24,8,0,0,LTC,0

:OUTPut:TLG1:SYSTem
:OUTPut:TLG2:SYSTem

:OUTPut:TLG3:SYSTem
Command to select the system of an optional PT8611 Tri-Level Sync Generators. Available systems are:

OFF	OFF
HD1080P60	HD 1080P/60
HD1080P5994	HD 1080P/59.94
HD1080P50	HD 1080P/50
HD1080I30	HD 1080I/30
HD1080I2997	HD 1080I/29.97
HD1080I25	HD 1080I/25
HD1080P30	HD 1080P/30
HD1080P2997	HD 1080P/29.97
HD1080P25	HD 1080P/25
HD1080P24	HD 1080P/24
HD1080P2398	HD 1080P/23.98
HD1080sF30	HD 1080sF/30
HD1080sF2997	HD 1080sF/29.97
HD1080sF25	HD 1080sF/25
HD1080sF24	HD 1080sF/24
HD1080sF2398	HD 1080sF/23.98
HD720P60	HD 720P/60
HD720P5994	HD 720P/59.94
HD720P50	HD 720P/50
HD720P30	HD 720P/30
HD720P2997	HD 720P/29.97
HD720P25	HD 720P/25
HD720P24	HD 720P/24
HD720P2398	HD 720P/23.98

example:
:outp:tlg5:syst HD1080sF2398;
sets system to HD 1080sF/23.98

:outp:tlg5:syst?;
response: HD1080sF2398

:OUTPut:TLG1:DELay
:OUTPut:TLG2:DELay
:OUTPut:TLG3:DELay
Command to set the delay of a PT8611 Tri-Level Sync Generator. The delay is defined by three parameters:

<Field>,<Line>,<HTime>

where <Field> is the field offset, <Line> is the line offset and <HTime> sets the horizontal time in ns.

Note: It is not possible to select a delay outside the range for the selected system. See table below:

system	SYSTem	MIN	MAX
HD 1080P/60	HD1080P60	-0,-562,0.0	0,562,14808.1
HD 1080P/59.94	HD1080P5994	-0,-562,0.0	0,562,14822.9
HD 1080P/50	HD1080P50	-0,-562,0.0	0,562,17771.0
HD 1080I/30	HD1080I30	-0,-562,0.0	0,562,29622.9
HD 1080I/29.97	HD1080I2997	-0,-562,0.0	0,562,29652.4
HD 1080I/25	HD1080I25	-0,-562,0.0	0,562,35548.8
HD 1080P/30	HD1080P30	-0,-562,0.0	0,562,29622.9
HD 1080P/29.97	HD1080P2997	-0,-562,0.0	0,562,29652.4
HD 1080P/25	HD1080P25	-0,-562,0.0	0,562,35548.8
HD 1080P/24	HD1080P24	-0,-562,0.0	0,562,37030.3
HD 1080P/23.98	HD1080P2398	-0,-562,0.0	0,562,37067.2
HD 1080sF/30	HD1080sF30	-0,-562,0.0	0,562,29622.9
HD 1080sF/29.97	HD1080sF2997	-0,-562,0.0	0,562,29652.4
HD 1080sF/25	HD1080sF25	-0,-562,0.0	0,562,35548.8
HD 1080sF/24	HD1080sF24	-0,-562,0.0	0,562,37030.3
HD 1080sF/23.98	HD1080sF2398	-0,-562,0.0	0,562,37067.2
HD 720P/60	HD720P60	-0,-374,0.0	0,375,22215.5
HD 720P/59.94	HD720P5994	-0,-374,0.0	0,375,22237.7
HD 720P/50	HD720P50	-0,-374,0.0	0,375,26659.9
HD 720P/30	HD720P30	-0,-374,0.0	0,375,44437.7
HD 720P/29.97	HD720P2997	-0,-374,0.0	0,375,44482.0
HD 720P/25	HD720P25	-0,-374,0.0	0,375,53326.6
HD 720P/24	HD720P24	-0,-374,0.0	0,375,55548.8
HD 720P/23.98	HD720P2398	-0,-374,0.0	0,375,55604.2

example:
:OUTPut:TLG5:del 0,1,144.0;
sets delay to 1 line and 144.0 ns

:OUTPut:TLG5:del?;
response: +0,+001,+00141.4 (rounded)

:OUTPut:HD1:PATTern :OUTPut:HD2:PATTern :OUTPut:HD3:PATTern

Command to select the pattern of an optional PT8612 HD Test Pattern Generators. Patterns available are:

- BLACk
- SDICheck
- PLUGe
- LRAMp
- CLAPperbrd
- COLOrbar
- COMBInation
- WINdow
- CROSshatch
- WHITe

example:
OUTP:HD2:PATT BLACK
sets the pattern in the HD module BLACK

OUTP:HD2:PATT?
response: BLACK

Some patterns have modifications.

Patterns:

- COLOrbar
- COMBInation

have the following modifications:

- HH - 100/0/100/0
- HS - 100/0/75/0
- SS - 75/0/75/0

Patterns:

- WINdow
- WHITe

have the following modifications:

AM5	-5% White
A0	0% White
A5	5% White
A10	10% White
A15	15% White
A20	20% White
A25	25% White
A30	30% White
A35	35% White
A40	40% White
A45	45% White
A50	50% White
A55	55% White
A60	60% White
A65	65% White
A70	70% White
A75	75% White
A80	80% White
A85	85% White
A90	90% White
A95	95% White
A100	100% White
A105	105% White

example:

:outp:dl5:patt:mod ss;
sets pattern modification to 75/0/75/0 for patterns COLORBAR and COMBINATION

:outp:dl5:patt:mod?;
response: SS

:outp:dl5:patt:mod AM5;
sets pattern modification to -5% white level for patterns WINDOW and WHITE

:outp:dl5:patt:mod?;
response: AM5

Trying to select modification not available for given pattern will result in an error, namely -224,"Illegal parameter value".

trying to select modification for non-modifiable patterns results in: -200,"Execution error".

:OUTPut:HD1:SYSTem
:OUTPut:HD2:SYSTem
:OUTPut:HD3:SYSTem
Command to select the system of an optional PT8612 HD Test Pattern Generators. Available systems are:

OFF	OFF
HD1080I30	HD 1080I/30
HD1080I2997	HD 1080I/29.97
HD1080I25	HD 1080I/25
HD1080P30	HD 1080P/30
HD1080P2997	HD 1080P/29.97
HD1080P25	HD 1080P/25
HD1080P24	HD 1080P/24
HD1080P2398	HD 1080P/23.98
HD720P60	HD 720P/60
HD720P5994	HD 720P/59.94
HD720P50	HD 720P/50
HD720P30	HD 720P/30
HD720P2997	HD 720P/29.97
HD720P25	HD 720P/25
HD720P24	HD 720P/24
HD720P2398	HD 720P/23.98
SD525	SD 487I/29.97 (525)
SD625	SD 576I/25 (625)

example:
:outp:dl5:syst HD1080P2398;
sets system to HD 1080P/23.98

:outp:dl5:syst?;
response: HD1080P2398

:OUTPut:HD1:EMBaudio:SIGnal
:OUTPut:HD2:EMBaudio:SIGnal
:OUTPut:HD3:EMBaudio:SIGnal
Command to select the signal of the embedded audio on PT8612 HD Test Pattern Generators. Available signals are:

SILence	Silence
SINE	1 kHz sine
CLICK	1 kHz sine with click
OFF	No embedded audio

example:
:outp:dl5:emb:sign off;
sets embedded audio to off

:outp:dl5:emb:sign?;
response: OFF

:OUTPut:HD1:EMBaudio:LEVel
:OUTPut:HD3:EMBaudio:LEVel
:OUTPut:HD4:EMBaudio:LEVel
Command to select the level of the embedded audio on PT8612 HD Test Pattern Generators. Available levels are:

DB0FS	0 dB Full Scale
DB6FS	-6 dB Full Scale
DB12FS	-12 dB Full Scale
DB18FS	-18 dB Full Scale
DB24FS	-24 dB Full Scale

example:
:outp:dl5:emb:level DB12FS;
sets embedded signal level to -12 dB Full Scale

:outp:dl5:emb:lev?;
response: DB12FS

:OUTPut:HD1:EMBaudio:CLIck
:OUTPut:HD3:EMBaudio:CLIck
:OUTPut:HD6:EMBaudio:CLIck
Command to select the click timing of the embedded audio on PT8612 HD Test Pattern Generators. Available values are (in milliseconds):

-499 . . . 500

example:
:outp:dl5:EMBaudio:CLIck -200;
sets embedded audio click to -200 ms

:outp:dl5:emb:cli?;
response: -200

:OUTPut:HD1:TEXT:STRing1
:OUTPut:HD4:TEXT:STRing2
:OUTPut:HD5:TEXT:STRing3
Command to insert one or more (up to 3) text strings into the pattern on PT8612 HD Test Pattern Generators. Three parameters are possible, i.e. OFF, ON and some text, "Text".

Note: To switch the text on/off use the parameters ON or OFF. To alter the actual text use "TEXT". The text is limited to sixteen characters. Only printable members of standard ASCII character set (7-bit) are available. Using other values will result in -360,"Communication error".

example:
:OUTPut:HD5:TEXT:STR3 "HI THERE";
sets text line 3 in HD5 to "HI THERE"

:OUTPut:HD5:TEXT:STR3 ON;
switch text line 3 ON

:OUTPut:HD5:TEXT:str3?;
response: ON,"HI THERE"

:OUTPut:HD1:TEXT:MOVement
:OUTPut:HD4:TEXT:MOVement
:OUTPut:HD5:TEXT:MOVement
Command to set movement of text on PT8612 HD Test Pattern Generators. Available possibilities are:

OFF	Text is stationary
VERtical	Vertical movement
HORizontal	Horizontal movement
BOTH	Movement in both directions

example:
:OUTPut:HD5:TEXT:mov both;
sets text movement to both directions

:OUTPut:HD5:TEXT:mov?;
response: BOTH

:OUTPut:HD1:TEXT:SCAle
:OUTPut:HD4:TEXT:SCAle
:OUTPut:HD5:TEXT:SCAle
Command to set text scale on PT8612 HD Test Pattern Generators. Available possibilities are: 1, 2, 3 and 4.

example:
:OUTPut:HD5:TEXT:sca 3;
sets text scale to 3

:OUTPut:HD5:TEXT:sca?;
response: 3

:OUTPut:HD1:TEXT:COLor
:OUTPut:HD4:TEXT:COLor
:OUTPut:HD5:TEXT:COLor

Command to set color of text on PT8612 HD Test Pattern Generators. Available colors are:

- WHIte
- YELlow
- CYAn
- GREen
- MAGenta
- BLUe
- BLAck

example:
:OUTPut:HD5:TEXT:col mag;
sets text color to magenta

:OUTPut:HD5:TEXT:color?;
response: MAGENTA

:OUTPut:HD1:TEXT:BACKground
:OUTPut:HD4:TEXT:BACKground
:OUTPut:HD5:TEXT:BACKground
Command to set background color of text on PT8612 HD Test Pattern Generators. Available colors are:

- WHIte
- YELlow
- CYAn
- GREen

- MAGenta
- BLUe
- BLAck

example:
:OUTPut:HD5:TEXT:back mag;
sets text background color to magenta

:OUTPut:HD5:TEXT:background?;
response: MAGENTA

:OUTPut:HD1:DELay
:OUTPut:HD4:DELay
:OUTPut:HD5:DELay
Command to set the delay of a PT8612 HD Test Pattern Generator. The delay is defined by three parameters:

<Field>,<Line>,<HTime>

where <Field> is the field offset, <Line> is the line offset and <HTime> sets the horizontal time in ns

Note: It is not possible to select a delay outside the range for the selected system. See table below.

system	SYSTem	MIN	MAX
HD 1080I/30	HD1080I30	-0,-562,0.0	0,562,29622.9
HD 1080I/29.97	HD1080I2997	-0,-562,0.0	0,562,29652.4
HD 1080I/25	HD1080I25	-0,-562,0.0	0,562,35548.8
HD 1080P/30	HD1080P30	-0,-562,0.0	0,562,29622.9
HD 1080P/29.97	HD1080P2997	-0,-562,0.0	0,562,29652.4
HD 1080P/25	HD1080P25	-0,-562,0.0	0,562,35548.8
HD 1080P/24	HD1080P24	-0,-562,0.0	0,562,37030.3
HD 1080P/23.98	HD1080P2398	-0,-562,0.0	0,562,37067.2
HD 720P/60	HD720P60	-0,-374,0.0	0,375,22215.5
HD 720P/59.94	HD720P5994	-0,-374,0.0	0,375,22237.7
HD 720P/50	HD720P50	-0,-374,0.0	0,375,26659.9
HD 720P/30	HD720P30	-0,-374,0.0	0,375,44437.7
HD 720P/29.97	HD720P2997	-0,-374,0.0	0,375,44482.0
HD 720P/25	HD720P25	-0,-374,0.0	0,375,53326.6
HD 720P/24	HD720P24	-0,-374,0.0	0,375,55548.8
HD 720P/23.98	HD720P2398	-0,-374,0.0	0,375,55604.2
SD 487I/29.97 (525)	SD525	-0,-262,0.0	0,262,63548.8
SD 576I/25 (625)	SD625	-0,-312,0.0	0,312,63993.3

example:
:OUTPut:HD5:del 0,1,144.0;
sets delay to 1 line and 144.0 ns

:OUTPut:HD5:del?;
response: +0,+001,+00141.4 (rounded)

:OUTPut:HD5:del -0,-561,-144.0;
sets delay to -561 lines and 144.0 ns

:OUTPut:HD5:del?;
response: -0,-561,-00141.4 (rounded)

:OUTPut:HD5:del -0,-562,0.0;
sets delay to -562 lines and 0.0 ns

:OUTPut:HD5:del?;
response: -0,-562,-00000.

:OUTPut:HD1?
:OUTPut:HD4?
:OUTPut:HD5?
Command to display complete setting of the PT8612 HD Test Pattern Generator. The response contains 8 fields:

<Pattern>, <Text>, <System>, <Audio signal>, <Audio level>, <Field>, <Line>, <HTime>

:OUTPut:DL1:PATTern
:OUTPut:DL2:PATTern
:OUTPut:DL3:PATTern
Command to select the pattern of an optional PT8613 Dual Link HD Test Pattern Generators. Patterns available are:

- BLACk
- SDICheck
- PLUGe
- LRAMp
- CLAPperbrd
- COLOrbar
- COMBInation
- WINdow
- CROSshatch
- WHITe

example:
OUTP:DL2:PATT BLACK
sets the pattern in the DL module BLACK

OUTP:DL2:PATT?
response: BLACK

Some patterns have modifications.

Patterns:

- COLOrbar
- COMBInation

have the following modifications:

HH - 100/0/100/0
HS - 100/0/75/0
SS - 75/0/75/0

Patterns:

- WINdow
- WHITe

have the following modifications:

AM5	-5% White
A0	0% White
A5	5% White
A10	10% White
A15	15% White
A20	20% White
A25	25% White
A30	30% White
A35	35% White
A40	40% White
A45	45% White
A50	50% White
A55	55% White
A60	60% White
A65	65% White
A70	70% White
A75	75% White
A80	80% White
A85	85% White
A90	90% White
A95	95% White
A100	100% White
A105	105% White

example:
:outp:dl5:patt:mod ss;
sets pattern modification to 75/0/75/0 for patterns COLORBAR and COMBINATION

:outp:dl5:patt:mod?;
response: SS

:outp:dl5:patt:mod AM5;
sets pattern modification to -5% white level for patterns WINDOW and WHITE

:outp:dl5:patt:mod?;
response: AM5

Trying to select modification not available for given pattern will result in an error, namely -224,"Illegal parameter value". trying to select modification for non-modifiable patterns results in: -200,"Execution error".

:OUTPut:DL1:SYSTem
:OUTPut:DL2:SYSTem
:OUTPut:DL3:SYSTem
Command to select the system of an optional PT8613 Dual Link HD Test Pattern Generators. Available systems are:

OFF	OFF
HD1080I30	HD 1080I/30
HD1080I2997	HD 1080I/29.97
HD1080I25	HD 1080I/25
HD1080P30	HD 1080P/30
HD1080P2997	HD 1080P/29.97
HD1080P25	HD 1080P/25
HD1080P24	HD 1080P/24
HD1080P2398	HD 1080P/23.98
HD1080SF30	HD 1080sF/30
HD1080SF2997	HD 1080sF/29.97
HD1080SF25	HD 1080sF/25
HD1080SF24	HD 1080sF/24
HD1080SF2398	HD 1080sF/23.98
HD720P60	HD 720P/60
HD720P5994	HD 720P/59.94
HD720P50	HD 720P/50
HD720P30	HD 720P/30
HD720P2997	HD 720P/29.97
HD720P25	HD 720P/25
HD720P24	HD 720P/24
HD720P2398	HD 720P/23.98
SD525	SD 487I/29.97 (525)
SD625	SD 576I/25 (625)

example:
:outp:dl5:syst HD1080SF2997;
sets system to HD 1080sF/29.97

:outp:dl5:syst?;
response: HD1080SF2997

:OUTPut:DL1:SYSTem:INTERFace
:OUTPut:DL2:SYSTem:INTERFace
:OUTPut:DL3:SYSTem:INTERFace

All HD 1080 systems have changeable interface. The following interfaces are available:

I1	SINGLE	4:2:2	YC_BC_R	10-bit
I2	DUAL	4:2:2:4	YC_BC_RA	12-bit
I3	DUAL	4:4:4	YC_BC_R	10-bit
I4	DUAL	4:4:4:4	YC_BC_RA	12-bit
I5	DUAL	4:4:4	GBR	10-bit
I6	DUAL	4:4:4:4	GBRA	12-bit

example:
:outp:dl5:syst:INTERFace I6;
sets interface to DUAL 4:4:4:4 GBRA 12-bit

:outp:dl5:syst:INTERFace?;
response: I6

:OUTPut:DL1:EMBaudio:SIGnal
:OUTPut:DL2:EMBaudio:SIGnal
:OUTPut:DL3:EMBaudio:SIGnal
Command to select the signal of the embedded audio on PT8613 Dual Link HD Test Pattern Generators. Available signals are:

SILence	Silence
SINE	1 kHz sine
CLICK	1 kHz sine with click
OFF	No embedded audio

example:
:outp:dl5:emb:sign off;
sets embedded audio to off

:outp:dl5:emb:sign?;
response: OFF

:OUTPut:DL1:EMBaudio:LEVel
:OUTPut:DL3:EMBaudio:LEVel
:OUTPut:DL4:EMBaudio:LEVel
Command to select the level of the embedded audio on PT8613 Dual Link HD Test Pattern Generators. Available levels are:

DB0FS	0 dB Full Scale
DB6FS	-6 dB Full Scale
DB12FS	-12 dB Full Scale
DB18FS	-18 dB Full Scale
DB24FS	-24 dB Full Scale

example:
:outp:dl5:emb:level DB12FS;
sets embedded signal level to -12 dB Full Scale

:outp:dl5:emb:lev?;
response: DB12FS

:OUTPut:DL1:EMBaudio:CLIck
:OUTPut:DL3:EMBaudio:CLIck
:OUTPut:DL6:EMBaudio:CLIck
Command to select the click timing of the embedded audio on PT8613 Dual Link HD Test Pattern Generators. Available values are (in milliseconds):

-499 . . . 500

example:
:outp:dl5:EMBaudio:CLIck -200;
sets embedded audio click to -200 ms

:outp:dl5:emb:cli?;
response: -200

:OUTPut:DL1:TEXT:STRing1
:OUTPut:DL4:TEXT:STRing2
:OUTPut:DL5:TEXT:STRing3
Command to insert one or more (up to 3) text strings into the pattern on PT8613 Dual Link HD Test Pattern Generators. Three parameters are possible, i.e. OFF, ON and some text, "Text'".

Note: To switch the text on/off use the parameters ON or OFF. To alter the actual text use "TEXT". The text is limited to sixteen characters. Only printable members of standard ASCII character set (7-bit) are available. Using other values will result in -360,"Communication error".

example:
:OUTPut:DL5:TEXT:STR3 "HI THERE";
sets text line 3 in DL5 to "HI THERE"

:OUTPut:DL5:TEXT:STR3 ON;
switch text line 3 ON

:OUTPut:DL5:TEXT:str3?;
response: ON,"HI THERE"

:OUTPut:DL1:TEXT:MOVement :OUTPut:DL4:TEXT:MOVement :OUTPut:DL5:TEXT:MOVement

Command to set movement of text on PT8613 Dual Link HD Test Pattern Generators. Available possibilities are:

OFF	Text is stationary
VERtical	Vertical movement
HORizontal	Horizontal movement

example:
:OUTPut:DL5:TEXT:mov both;
sets text movement to both directions

:OUTPut:DL5:TEXT:mov?;
response: BOTH

:OUTPut:DL1:TEXT:SCAle
:OUTPut:DL4:TEXT:SCAle
:OUTPut:DL5:TEXT:SCAle

Command to set text scale on PT8613 Dual Link HD Test Pattern Generators. Available possibilities are: 1, 2, 3 and 4.

example:
:OUTPut:DL5:TEXT:sca 3;
sets text scale to 3

:OUTPut:DL5:TEXT:sca?;
response: 3

:OUTPut:DL1:TEXT:COLor
:OUTPut:DL4:TEXT:COLor
:OUTPut:DL5:TEXT:COLor
Command to set color of text on PT8613 Dual Link HD Test Pattern Generators. Available colors are:

- BLACk
- SDICheck
- PLUGe
- LRAMp
- CLAPperbrd
- COLOrbar
- COMBInation
- WINdow
- CROSshatch
- WHITe

example:
:OUTPut:DL5:TEXT:col mag;
sets text color to magenta

:OUTPut:DL5:TEXT:color?;
response: MAGENTA

:OUTPut:DL1:TEXT:BACKground
:OUTPut:DL4:TEXT:BACKground
:OUTPut:DL5:TEXT:BACKground

Command to set background color of text on PT8613 Dual Link HD Test Pattern Generators. Available colors are:

- BLACk
- SDICheck
- PLUGe
- LRAMp
- CLAPperbrd
- COLOrbar
- COMBInation
- WINdow
- CROSshatch
- WHITe

example:
:OUTPut:DL5:TEXT:back mag;
sets text background color to magenta

:OUTPut:DL5:TEXT:background?;
response: MAGENTA

:OUTPut:DL1:DELay
:OUTPut:DL4:DELay
:OUTPut:DL5:DELay

Command to set the delay of a PT8613 Dual Link HD Test Pattern Generator. The delay is defined by three parameters:

<Field>, <Line>, <HTime>

where <Field> is the field offset, <Line> is the line offset and <HTime> sets the horizontal time in ns

Note: It is not possible to select a delay outside the range for the selected system. See table below.

system	SYSTem	MIN	MAX
HD 1080I/30	HD1080I30	-0,-562,0.0	0,562,29622.9
HD 1080I/29.97	HD1080I2997	-0,-562,0.0	0,562,29652.4
HD 1080I/25	HD1080I25	-0,-562,0.0	0,562,35548.8
HD 1080P/30	HD1080P30	-0,-562,0.0	0,562,29622.9
HD 1080P/29.97	HD1080P2997	-0,-562,0.0	0,562,29652.4
HD 1080P/25	HD1080P25	-0,-562,0.0	0,562,35548.8
HD 1080P/24	HD1080P24	-0,-562,0.0	0,562,37030.3
HD 1080P/23.98	HD1080P2398	-0,-562,0.0	0,562,37067.2
HD 720P/60	HD720P60	-0,-374,0.0	0,375,22215.5
HD 720P/59.94	HD720P5994	-0,-374,0.0	0,375,22237.7
HD 720P/50	HD720P50	-0,-374,0.0	0,375,26659.9
HD 720P/30	HD720P30	-0,-374,0.0	0,375,44437.7
HD 720P/29.97	HD720P2997	-0,-374,0.0	0,375,44482.0
HD 720P/25	HD720P25	-0,-374,0.0	0,375,53326.6
HD 720P/24	HD720P24	-0,-374,0.0	0,375,55548.8
HD 720P/23.98	HD720P2398	-0,-374,0.0	0,375,55604.2
SD 487I/29.97 (525)	SD525	-0,-262,0.0	0,262,63548.8
SD 576I/25 (625)	SD625	-0,-312,0.0	0,312,63993.3

example:
:OUTPut:DL5:del 0,1,144.0;
sets delay to 1 line and 144.0 ns

:OUTPut:DL5:del?;
response: +0,+001,+00141.4 (rounded)

:OUTPut:DL5:del -0,-561,-144.0;
sets delay to -561 lines and 144.0 ns

:OUTPut:DL5:del?;
response: -0,-561,-00141.4 (rounded)

:OUTPut:DL5:del -0,-562,0.0;
sets delay to -562 lines and 0.0 ns

:OUTPut:DL5:del?;
response: -0,-562,-00000.

:OUTPut:DL1?
:OUTPut:DL4?
:OUTPut:DL5?

Command to display complete setting of the PT8613 Dual Link HD Test Pattern Generator. The response contains 8 fields:

<Pattern>, <Text>, <System>, <Audio signal>, <Audio level>, <Field>, <Line>, <HTime>

OUTPut:LTCG1:FORMat
OUTPut:LTCG2:FORMat
Command to set the format of the LTC generator module. The delay is defined by four parameters: <Format> ,<Syncmode>, <Hour>, <Min> where <Format> sets the format to one of the format listed in table 10, <Syncmode> sets the mode to reset the framecounter (see table 11), <Hour> sets the sync hour and <Min> sets the sync minute. The sync mode is only relevant for 29.97 frames per second, as other formats always stays synchronized to real time.

24FPS	24 Frames pr second
25FPS	25 Frames pr second
2997NOND	29.97 Frames pr second, non drop frame
2997DROP	29.97 Frames pr second, drop frame
30FPS	30 Frames pr second

Table 10: LTC Generator formats

NONE	No synchronization (Only manual sync.)
CONF	Confirm synchronization. Press `E` to confirm.
AUTO	Auto synchronization. No need to do anything.

Table 11: LTC Generator Sync modes

<Hour>, <Min> sets the time, when the frame counter shall be resynced. The hour can be set to a number between 0 and 23. The minutes can be set between 0 and 59.

example:
:OUTPut:LTCG1:FORMAT '24FPS','NONE',0,0;
Sets the format to 24 frames per second, the sync mode and time is not relevant for this mode.

:OUTPut:LTCG1:FORMAT '24FPS','NONE',0,0;
response: 24FPS,NONE,0,0

:OUTPut:LTCG1:FORMAT '2997DROPF','AUTO',23,30;
Sets the format to 29.97 frames per second, drop frame. The frames counter will reset at 23:30, automatically.

:OUTPut:LTCG1:OFFSET
:OUTPut:LTCG2:OFFSET

Offsets the LTC generator ±0.5 seconds relative to the absolute GPS time. Time is in nano seconds.

example:
:OUTPut:LTCG2:OFFSET 3000;
Sets the LTC generator to have frame 0 start 3 micro seconds before the GPS time seconds.

:OUTPut:LTCG2:OFFSET?;
response: 3000

8.5 Communication Error Codes

8.5.1 Command Errors [-199, -100]

Error Number	Error string [description/explanation/example]
-100	Command error.
	The command is invalid or incorrect.
-101	Invalid character.
	A command or parameter contains an invalid character, e.g. a header containing an ampersand, SYST:VERS&
-102	Syntax error.
	An unrecognized command or datatype was encountered, e.g. a string was received when the generator did not accept strings.
-103	Invalid separator.
	A separator was expected, but an illegal character was encountered, e.g. the semicolon was omitted after a command, *IDN?:SYST:ERR?;
-104	Data type error.
	A data element different than one allowed was encountered, e.g. numeric data was expected but string data was encountered.
-108	Parameter not allowed.
	More parameters was received than expected for the command, e.g. the *IDN?; command accepts no parameters, so receiving *IDN? 2; is not allowed.
-109	Missing parameter.
	Fewer parameters were received than expected for the command, e.g. OUTP:BB1:DEL2,2; is missing one parameter.
-110	Command header error.
	An error was detected in the command header.
-111	Header separator error.
	A character which is not a legal header separator was encountered, e.g. no white space followed the header, thus SYST:PRES:NAME“MACRO” is an error.
-112	Program mnemonic too long.
	The header contains more than twelve characters.
-113	Undefined header.
	The header is syntactically correct, but is not defined for the device.
-114	Header suffix out of range.
	The command is invalid because the value of the numeric suffix attached to the program mnemonic is out of range, e.g. OUTP:BB12? Is illegal because only 8 BB’s exists.
-120	Numeric data error.
	An error in the numeric data was encountered.
-121	Invalid character in number.
	An invalid character for the data type was encountered, e.g. an alpha in a decimal value.

-123	Exponent too large.
	The magnitude of the exponent was larger than 32000.
-124	Too many digits.
	The mantissa of a decimal numeric data element contained more than 255 digits.
-128	Numeric data not allowed.
	A legal numeric data was received, but the device does not accept one.
-130	Suffix error.
	An error in the suffix was encountered.
-131	Invalid suffix.
	The suffix is syntactically incorrect.
-134	Suffix too long.
	The suffix contains more than twelve characters.
-138	Suffix not allowed.
	A suffix was encountered after a numeric element, which does not allow suffixes.
-140	Character data error.
	An error in the character was encountered.
-150	String data error.
	An error in the string data was encountered.
-151	Invalid string data.
	A string data element was expected, but was invalid for some reason, e.g. an END message was received before the terminal quote character.
-158	String data not allowed.
	A string data element was received but was not allowed by the device.
-160	Block data error.
	There is an error in the block data received.
-161	Invalid block data.
	A block data was expected, but was invalid for some reason.
-170	Expression error.
	There is an error in the expression received.

8.5.2 Execution Errors [-299, -200]

Error Number	Error string [description/explanation/example]
-200	Execution error.
-220	Parameter error.
	Indicates that a program data element related error occurred.
-222	Data out of range.
	Indicates that a legal program data element was received but could not be executed because the interpreted values was outside the range as defined by the device, e.g. the command OUTP:BB1:SCHP 200; is illegal since the Sc-H Phase cannot exceed 180deg.
-223	Too much data.
	Indicates that a legal program data element of block, expression, or string type was received that contained more data than the device could handle due to memory or related device-specific requirements.
-224	Illegal parameter value.
	Used where exact value, from a list of possibles, was expected.

-233	Invalid version.
	Indicates that a legal program data element was parsed but could not be executed because the version of the data is incorrect to the device.
-241	Hardware missing.
	Indicates that a legal program command or query could not be executed because of missing device hardware.

8.5.3 Device specific Errors [-399, -300]

Error Number	Error string [description/explanation/example]
-300	Device-specific error.
-350	Queue overflow.
	A specific code entered into the queue in lieu of the code that caused the error. This code indicates that there is no room in the queue and an error occurred but was not recorded.
-360	Communication error.
	A communication error on the serial port was detected.
-361	Parity error in program message.
	Parity bit not correct when data received on the serial port.
-362	Framing error in program message.
	A stop bit was not detected when data was received, e.g. a bad rate mismatch.
-363	Input buffer overrun.
	Software or hardware input buffer on serial port overflows.

8.5.4 Query Errors [-499, -400]

Error Number	Error string [description/explanation/example]
-400	Query error.
	An error occurred during a query.
-410	Query INTERRUPTED.
	Indicates that a condition causing an INTERRUPTED Query error occurred.
-420	Query UNTERMINATED.
	Indicates that a condition causing an UNTERMINATED Query error occurred.
-430	Query DEADLOCKED.
	Indicates that a condition causing a DEADLOCKED Query error occurred.

9 Error & Message Codes

Code	Description
E(001)	POWER FAILURE: -5VOLT
E(002)	POWER FAILURE: 12VOLT
E(003)	TEMPERATURE FAILURE
E(005)	Temperature warning
E(006)	Level error at Bbn
E(006)	Level error at SDI-TSGn
E(006)	Level error at ANALOG TPGn
E(006)	Level error at SDI TPGn
E(006)	Level error at UNKNOWN OPTION
E(002)	Configuration error
E(002)	Multiple errors
Black Burst units, type 01x:	
E(010)	General failure: BBn
E(011)	No contact to BBn
E(012)	Error writing to BBn
E(013)	No response from BBn
E(014)	Error reading from BBn
SDI Test Signal generators, type 02x:	
E(020)	General failure: SDI-TSGn
E(021)	No contact to SDI-TSGn
E(022)	Error writing to SDI-TSGn
E(023)	No response from SDI-TSGn
E(024)	Error reading from SDI-TSGn
AES/EBU unit, type 03x:	
E(030)	General failure: AES/EBU
E(031)	No contact to AES/EBU
E(032)	Error writing to AES/EBU
E(033)	No response from AES/EBU
E(034)	Error reading from AES/EBU
Analog test signal/pattern generator, type 04x:	
E(040)	General failure: ANALOG TPGn
E(041)	No contact to ANALOG TPGn
E(042)	Error writing to ANALOG TPGn
E(043)	No response from ANALOG TPGn
E(044)	Error reading from ANALOG TPGn
SDI test signal/pattern generator, type 05x:	
E(050)	General failure: SDI TPGn
E(051)	No contact to SDI TPGn
E(052)	Error writing to SDI TPGn
E(053)	No response from SDI TPGn
E(054)	Error reading from SDI TPGn
SDI genlock unit, type 06x:	
E(060)	General failure: SDI GENLOCK
E(061)	No contact to SDI GENLOCK
E(062)	Error writing to SDI GENLOCK
E(063)	No response from SDI GENLOCK
E(064)	Error reading from SDI GENLOCK
TIME Code/Clock unit, type 07x:	
E(070)	General failure: TIME MODULE
E(071)	No contact to TIME MODULE
E(072)	Error writing to TIME MODULE
E(073)	No response from TIME MODULE

E(074)	Error reading from TIME MODULE
OSC unit, type 08x:	
E(080)	General failure: OSC
E(081)	No contact to OSC
E(082)	Error writing to OSC
E(083)	No response from OSC
E(084)	Error reading from OSC
ROM MEMORY unit, type 09x:	
E(090)	General failure: ROM MEMORY
E(094)	Error reading from ROM MEMORY
E(095)	Checksum error: ROM MEMORY
RAM MEMORY unit, type 10x:	
E(100)	General failure: RAM MEMORY
KEYBOARD unit, type 11x:	
E(110)	General failure: KEYBOARD
E(111)	No contact to KEYBOARD
E(112)	Error writing to KEYBOARD
E(113)	No response from KEYBOARD
E(114)	Error reading from KEYBOARD
LCD ADC unit, type 12x:	
E(120)	General failure: LCD ADC
E(121)	No contact to LCD ADC
E(122)	Error writing to LCD ADC
E(123)	No response from LCD ADC
E(124)	Error reading from LCD ADC
TEMP ADC unit, type 13x:	
E(130)	General failure: TEMP ADC
E(131)	No contact to TEMP ADC
E(132)	Error writing to TEMP ADC
E(133)	No response from TEMP ADC
E(134)	Error reading from TEMP ADC
POWER ADC unit, type 14x:	
E(140)	General failure: POWER ADC
E(141)	No contact to POWER ADC
E(142)	Error writing to POWER ADC
E(143)	No response from POWER ADC
E(144)	Error reading from POWER ADC
LEVEL DETECTOR unit, type 15x:	
E(150)	General failure: LEVEL DECTOR
E(151)	No contact to LEVEL DETECTOR
E(152)	Error writing to LEVEL DETECTOR
E(153)	No response from LEVEL DETECTOR
E(154)	Error reading from LEVEL DETECTOR
SERIAL REMOTE, type 16x: (these are two line error message)	
E(160)	No response from RS232 Check cable & RS232 settings
E(161)	Error downloading from RS232 Checksum error receiving data

Code	Description
M(001)	Parallel remote operating Local lockout
M(002)	Serial remote operating Goto local?
M(003)	Serial remote operating Local lockout

10 DK-5300 PC Software

10.1 General Information

DK-5300 is a Windows® program that enables you to configure and remote control PT5300's connected to your LAN (Local Area Network).
The latest version of DK-5300.EXE can always be found on our web site www.dk-technologies.com.

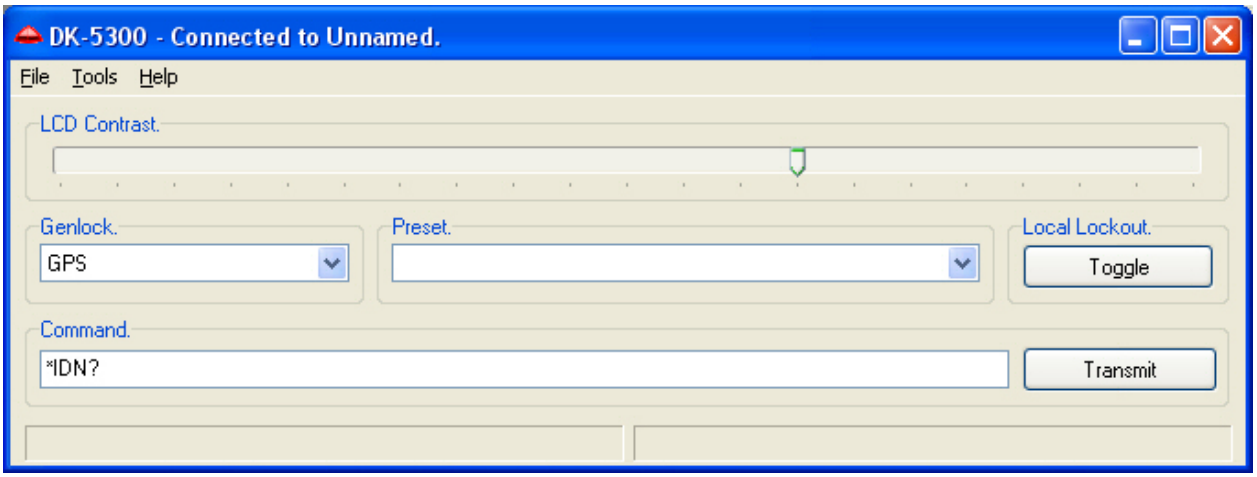

Figure 9: The DK-5300 main window.

The configuration of the PT5300 network settings are done using the NetFinder protocol. This enables you to configure the IP address, User name, Password, etc... on multiple PT5300's from one single location. The network port for the NetFinder protocol is 3040 (UDP).

The normal remote commands described in section 7 are transmitted using the Telnet protocol. The default port for Telnet is 23 (TCP).

ATTENTION!

It is strongly advised to change the default username and password for the Ethernet interface.

Please see section 10.3 for further information.

10.2 Connect to the PT5300.

Operation:

- Start the DK-5300.EXE and allow the program to connect to the network.
  - The NetFinder protocol uses port 3040.
  - The Telnet port can be changed but as default Telnet uses port 23.
- When the main window of DK-5300 is visible, go to the menu "File" and select "NetFinder".
- When the NetFinder window is visible, click "Refresh Instrument List".

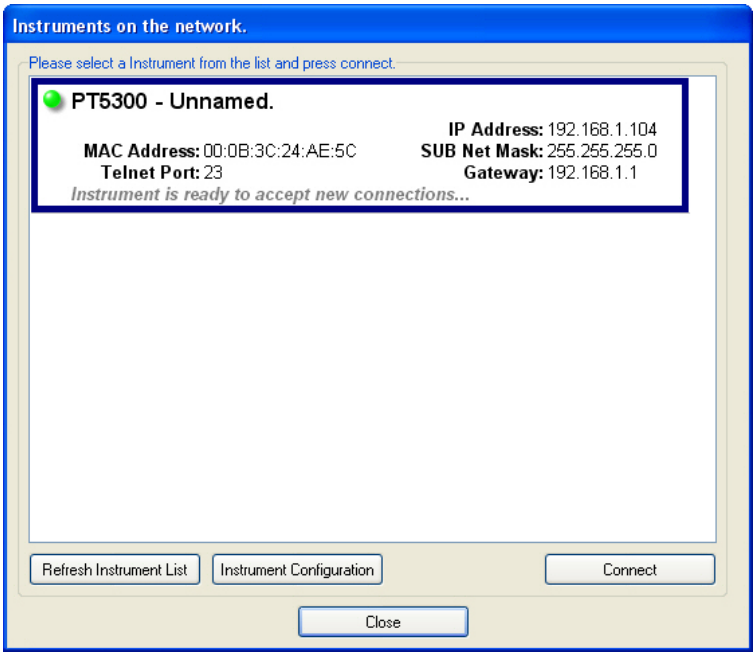

Figure 10: The NetFinder Window.

  - DK-5300 will now search the LAN for PT5300's. This process takes 10 seconds.
  - During the search, PT5300's will be added to the list in the NetFinder window. Instruments are added in the order they are discovered.
  - It is possible to connect to a PT5300 while the search is in progress.
  - Each item in the instrument list will show the instrument type, the user configurable NetFinder name, the connection status of the instrument and optionally the IP settings of the instrument and Telnet port.

    Connection status.
    - The Instrument is ready to accept new connections.
    - The Instrument is busy. A connection has been established from another computer.
    - Login in progress. A connection is being established from another computer.
    - Instrument is unavailable. The Telnet protocol has been disabled locally on the PT5300.

    Please see section 6.7.5 for information about how to enable or disable the Telnet protocol.

- Select from the instrument list the PT5300 you wish to connect to and press "Connect".
  - You will be asked for the user name and password.
  - The default user name is **Admin**. (Case sensitive.)
  - The default password is **2730**. (Case sensitive.)
  - If "Remember Login" is checked the user name and password is saved in the DK-5300 configuration file.

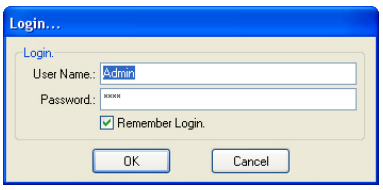

Figure 11: The Login dialog.

- When a connection with a PT5300 has been established, the main window will then show basic options for remote control. *(Figure 9).*
  - **LCD Contrast:** Set the LCD contrast.
  - **Genlock:** Select the genlock source.
  - **Preset:** Select the active preset. The dropdown box will show the active preset. If no preset is active the dropdown box will be empty.
  - **Local Lockout:** Toggle whether or not the PT5300 responds to the local user interface.
  - **Command:** Enter a command and press "Transmit" to send a specific command to the PT5300. Please see section 8 for further information about valid commands. There will be no indication whether or not the command has been executed unless the command is a query command.

10.3 Change network configuration.

Operation:

- Open the NetFinder window.
  - From the main window select "File" -> "NetFinder".
- When the NetFinder window is visible, click "Refresh Instrument List". *(Figure 10).*
- Select from the instrument list the PT5300 you wish to configure and press "Instrument Configuration".
- The Instrument Configuration window will appear.

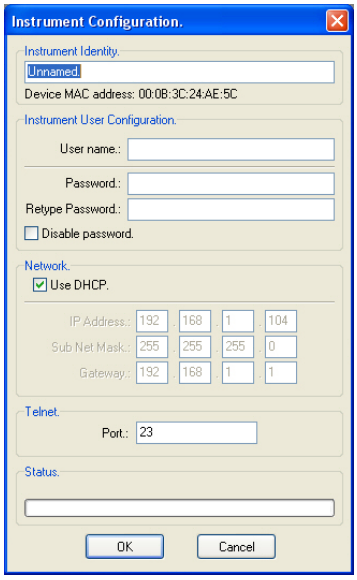

Figure 12: The Instrument Configuration Window.

- **Configuration options.**

  - **Instrument Identity:**
    The text field allows you to change the NetFinder name. When multiple PT5300's are connected to the LAN the NetFinder name is used for easy identification in the Instrument List *(Figure: 10)*.
    The NetFinder name is also shown in the main window of DK-5300 when a connection with the instrument has been established.
  - **Instrument User Configuration:**
    The text field "User Name" allows you to change the default user name. If this field is left blank no changes will be made to the user name.
    The password fields allows you to change the default password. The two password fields must match each other. The password can be disabled by checking "Disable Password". If the password fields are left blank, no changes will be made to the password.
  - **Network.**
    The instrument is by default configured to use DHCP. This can be disabled by un-checking DHCP. When DHCP is disabled the text fields for IP configuration is enabled. If you enter the wrong IP settings you might not be able to reconnect to the instrument.

    The DHCP and IP settings can always be reconfigured locally on the instrument. Please see section 6.7.5 for further information about how to do this.
  - **Telnet:**
    The default Telnet port is 23. In the Telnet field this can be changed. The Telnet port can be configured to a value between 1 and 65535.

- Click "OK" to apply the changes. If "Cancel" is selected the changes will be discarded.
  - When you apply the changes you will be asked for the user name and password. *(Figure 11)*.
  - The default user name is **Admin**. (Case sensitive.)
  - The default password is **2730**. (Case sensitive.)
  - If "Remember Login" is checked the user name and password is saved in the DK-5300 configuration file.
  - A message box will then appear stating whether or not the changes have been accepted by the instrument.
  - When the configuration has been changed you should wait approximately 30 seconds for the changes to take effect and then refresh the instrument list.

The instrument can not be reconfigured using the NetFinder protocol while a Telnet connection is active.
If the network settings are changed locally on the instrument (please see section 6.7.5 for further information) all connections will be disconnected while reloading the new configuration.

10.4 DK-5300 Options

Operation:

- Open the option window.
  - From the main window select "Tools" -> "Options...".
- The option window currently have two options.

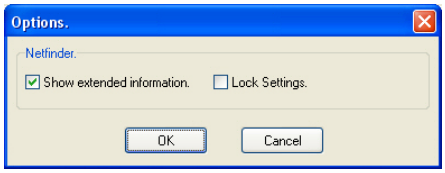

Figure 13: The DK-5300 Option Window.

  - **Show extended information:**
    When checked, the instrument list in the NetFinder window will show the MAC address, Telnet Port and IP information for every instrument discovered on the LAN. If un-checked, only the NetFinder name and connection status is shown. *(Figure: 10)*
  - **Lock Settings:**
    When checked, the "Instrument Configuration" function in the NetFinder window will be disabled.
- Click "OK" to apply the changes. If "Cancel" is selected the changes will be discarded.