5201 Compact VariTime Sync Generator.

RS232 Communication.

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2.   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
PT 5230 Digital Video Generator. SCPI Parser Chart, rev. n.n, KEN, 1998
PT 5201 Signals, rev. n.n, KEN, 2000

3.   PRESET BUTTON

The PT5201 has an actual setting and 4 user presets.

Whenever a user preset is "selected", the contents of the preset will be copied to the actual setting. When a fatory reset is performed, the actual setting will be forced to a "zero" configuration in either PAL or NTSC.

The system for fatory reset is PAL when the PT5201 leaves the factory, but it is possible to alter the system from the PT5201 PC Remote Control Software in order to force the PT5201 to a NTSC configuration during a factory reset.

The (p)reset button has several functions:

Pressure < 1s: check if any preset is activate and display the number on the TV SYSTEM LEDs

Pressure > 3s: Select a preset(s) for each additional second the preset button is pressed. No preset is also an option, i.e. leave everything as is.

Pressure > 15s: Perform a factory reset, i.e. force the actual setting to a known configuration in either PAL or NTSC, and leave the user presets as is.

4.   CONFIGURATION AND SYNTAX

• Control characters of the RS232 interface:

	Control character	Function
	$0A_{hex}$	Terminator, i.e. newline < LF>

• Buffers:

Receive buffer: 512 bytes
Transmit buffer: 128 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

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6:	DSR	Not used	
7:	RTS	Not used	
8:	CTS	Not used	
9:	RI	Not used.	

5. COMMANDS SUMMARY.

Note: Commands are valid for master software version 1.1

All commands listed consists of both a set- and request-command unless specifically listed in the table as < query only> or < no query> .

5.1 Mandated Commands

Command	Parameter	Status after *RST	Remarks
*CLS	-		Clear Status Command
*ESE			
*ESE?			
*ESR?			
*IDN?			Device identification query
*OPC			
*OPC?			
*RST			Reset Command
*SAV	< 1 to 4 >		
*RCL	< 1 to 4 >		
*SRE			
*SRE?			
*STB?			
*TST?			
*WAI			

5.2 Required commands

5.2.1 SYSTem subsystem

Command	Parameter	Status after *RST	Remarks
:ERRor?		-	< query only>
:VERSion?		-	< query only>
:PRESet			
[:RECall]	< 1 to 4>		
:STORe	< 1 to 4>		
:NAME[2]	< 1 to 4> ,< name>		
:AUTHor[2]	< 1 to 4> ,< author name>		
:DATE	< 1 to 4> [,< year> ,< month> ,< day>]		

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5.2.2 STATus subsystem

Command	Parameter	Status after *RST	Remarks
:OPERation			
[:EVENt]?			< query only>
:CONDition?			
:ENABle			
:ENABle?			
:QUEStionable			
[:EVENt]?			< query only>
:CONDition			
:ENABle			
:ENABle?			
:PRESet			

5.3 Instrument commands

5.3.1 INPut subsystem

Command	Parameter	Status after *RST	Remarks
:GENLock			
:SYSTem	INTernal|PALBurst|NTSCburst|F10MHZ	INTernal	
:DELay	< Field> ,< Line> ,< HTime>	0,0,0	
:CALibrate			
:ENABle	OFF|ON		
:ADJust	UP|DOWN|MIN|MAX		
:STORe	-		< no query>
:GENLock?	-	-	< query only>

5.3.2 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	
:BB1?	-	-	< query only>
:BB2			
:SYSTem	PAL|PAL_ID|NTSC	PAL	
:DELay	< Field> ,< Line> ,< Htime>	0,0,0	
:SCHPhase	< -179 to 180>	0	
:BB2?	-	-	< query only>
:BB3			
:SYSTem	PAL|PAL_ID|NTSC	PAL	
:DELay	< Field> ,< Line> ,< Htime>	0,0,0	
:SCHPhase	< -179 to 180>	0	
:BB3?	-	-	< query only>
:CBGenerator			
:PATTern	See ref. **"PT5201 Signals"**	CBEBu	

Command	Parameter	Status after *RST	Remarks
:SYSTem[1]	PAL|NTSC	PAL	
:DELay	< Field> ,< Line> ,< Htime>	0,0,0	
:SCHPhase	< -179 to 180>	0	**1,4° resolution**
:EMBaudio			
[:SIGNal]	See ref. **"PT5201 Signals"**		Digital output only
:CBGenerator?	-	-	
:AUDio			< no query>
[:OUTPut]	ANALog|AESebu	AESebu	
:ANALog			
:SIGNal	See ref. **"PT5201 Signals"**		
:LEVel	See ref. **"PT5201 Signals"**	SILence	
:CLICk	1|3		
:ANALog?			
:AESebu			
:SYSTem	PAL|NTSC		
:SIGNal	See ref. **"PT5201 Signals"**		
:LEVel	See ref. **"PT5201 Signals"**	SILence	
:TIMing	See ref. **"PT5201 Signals"**	PAL	Only 48kHz
:WORDclock	F441KHZ | F48KHZ		
:CLICk	1|3		
:AESebu?			

5.3.3 FACTory subsystem

Command	Parameter	Status after *RST	Remarks
:PASSword	ON|< string_data>	ON	Password is required to write the parameters, it is however NOT required to read them.
:RESet			Resets BOTH actual settings and presets.
:V24Circuit			Password is ALWAYS required to use this command. < no query>
:COMMand[2]	< n> ,< string_data>	-	n: internal address
:TRANsparent	BB|SPG		To end the transparent state, issue the command < CTRL-C> which will reset the PT5201.
:CHECksum			
:CODE			< query only>
:PLD			< query only>
:EMBaudio			< query only>
:PATTern			< query only>
:RANGe	< start_address> ,< end_address>		< query only>
:MAINboard			< no query>
:IDN			
:COMPany[2]	< string_data>		Write/read NV RAM
:TYPE[2]	< string_data>		Write/read NV RAM
:KUNumber[2]	< string_data>		Write/read NV RAM
:SWRevision[2]	< string_data>		Write/read NV RAM
:SYSTem[1] [3]	PAL|NTSC		Write/read NV RAM
:FMSDate			
:PRODuction	< year> ,< month> ,< day>		Write/read NV RAM
:UPDate	< year> ,< month> ,< day>		Write/read NV RAM
:VERSion			< query only> Master SW
:GENLock			< no query>
[:DATE]	< year> ,< month> ,< day>		Write/read NV RAM
:VERSion			< query only>
:FREFerence			
[:DATE]	< year> ,< month> ,< day>		Write/read NV RAM
:DAC			Write/read NV RAM
:UREFerence			
[:DATE]	< year> ,< month> ,< day>		Write/read NV RAM
:DAC			Write/read NV RAM
:HPHZero	< pal> ,< ntsc>		Write/read NV RAM
:PHASe	< pal> ,< ntsc>		Write/read NV RAM
:BB1			< no query>
[:DATE]	< year> ,< month> ,< day>		Write/read NV RAM

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Command	Parameter	Status after *RST	Remarks
:VERSion			< query only>
:SIGNal	NORMal|F45MHZ		< no query>
:PHASe	< pal> ,< ntsc>		Write/read NV RAM
:SCHPhase	< pal> ,< ntsc>		Write/read NV RAM
:DAC	< gain> ,< offset> ,< level>		Write/read NV RAM
:BB2			< no query>
[:DATE]	< year> ,< month> ,< day>		Write/read NV RAM
:PHASe	< pal> ,< ntsc>		Write/read NV RAM
:SCHPhase	< pal> ,< ntsc>		Write/read NV RAM
:DAC	< gain> ,< offset> ,< level>		Write/read NV RAM
:BB3			< no query>
[:DATE]	< year> ,< month> ,< day>		Write/read NV RAM
:PHASe	< pal> ,< ntsc>		Write/read NV RAM
:SCHPhase	< pal> ,< ntsc>		Write/read NV RAM
:DAC	< gain> ,< offset> ,< level>		Write/read NV RAM
:CBGenerator			< no query>
[:DATE]	< year> ,< month> ,< day>		Write/read NV RAM
:AGAIN	< pal> ,< ntsc>		Write/read NV RAM **Instant update**
:CGAIN	< pal> ,< ntsc>		Write/read NV RAM **Instant update**
:PHASe	< pal> ,< ntsc>		Write/read NV RAM **Instant update**
:SCHPhase	< pal> ,< ntsc>		Write/read NV RAM **Instant update**
:AUDio			
[:STATus]			< query only>
:DATE	< year> ,< month> ,< day>		Write/read NV RAM
:ALEVel	< left> ,< right>		Write/read NV RAM **Instant update**
:PLD			< query only>
:VERSion[4]	< video> ,< audio>		< query only>
:TCXO			
[:STATus]			< query only>
:MMCHip	< sub address> [,< data>]		

[1]: The SW has also been prepared for the system PAL_ID.

[2]: String-data may NOT contain any spaces due to an errorneous RS232 parser. This is NOT in compliance with SCPI.

[3]: This command is NOT password protected.

[4]: The video version is not supported at this time, hence it always return 0, ZERO.

6.   PT5201 Signals

6.1   Symbols:

X: Both G- and M-system.   G: Only in G-system.
M: Only in M-system

6.2   Video patterns.

	Remote name	PT5201
CBAR		
SMPTE C.Bar	CBSMpte	M
EBU C.Bar	CBEBu	G
FCC C.Bar	CBFCc	M
C.Bar ITU801	CBEBu8	X
100% C.Bar	CB100	X
75% C.Bar+ Grey[1]	CBGRey75	G
75% C.Bar+ Red[2]	CBRed75	G
75% Red	RED75	X
M.BURST		
Multiburst	MULTiburst	X
CCIR Line18	CCIR18	G
WINDOW		
Window 10%	WIN10	X
Window 15%	WIN15	X
Window 20%	WIN20	X
Window 100%	WIN100	X
15kHz Bl/Wh	BLWH15KHZ	X
White 100%	WHITe100	X
Black	BLACk	X
SPECIAL		
SDI Check Field	SDICheck	X
Digital Grey	DGRey	X
LINEARITY		
Staircase 5step	STAircase5	X
Staircase 10step	STAircase10	X
PATTERNS		
Crosshatch	CROSshatch	X
PLUGE	PLUGe	X

[1]: 75% Colorbar + grey

[2]: EBU (100%) colorbar + red

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6.3 Pattern selections during system change

The tables apply when one or more signals only exists in one system.

```
┌─────────────────────────────────────────────────────────────┐
│                  COLORBAR GENERATOR:                          │
│ PAL Specific patterns:                                        │
│    EBU C.Bar            →      SMPTE C.Bar                     │
│    75% C.Bar+ Grey      →      SMPTE C.Bar                     │
│    75% C.Bar+ Red       →      SMPTE C.Bar                     │
│    CCIR Line18          →      Multiburst                      │
│                                                               │
│ NTSC specific patterns:                                       │
│    SMPTE C.Bar          →      EBU C.Bar                       │
│    FCC C.Bar            →      EBU C.Bar                       │
└─────────────────────────────────────────────────────────────┘
```

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6.4 Audio signals

	Remote name	Embedded	Analog	AES/EBU
Signals				
Off	OFF	X		
Silence	SILence	X		
Stereo 500 Hz	S500HZ		X	X
Stereo 1 kHz	S1KHZ	X	X	X
Stereo EBU 1 kHz	SEBU1KHZ		X	X
Stereo 8 kHz	S8KHZ		X	X
Levels				
Silence	SILence		X	X
0 dBFS	0			X
-9 dBFS	-9			X
-12 dBFS	-12			X
-15 dBFS	-15			X
-16 dBFS	-16			X
-18 dBFS	-18			X
-21 dBFS	-21			X
Levels				
+ 10 dBm	10		X	
+ 8 dBm	8		X	
+ 7 dBm	7		X	
+ 6 dBm	6		X	
+ 5 dBm	5		X	
+ 4 dBm	4		X	
+ 3 dBm	3		X	
+ 2 dBm	2		X	
+ 1 dBm	1		X	
0 dBm	0		X	
-1 dBm	-1		X	
-2 dBm	-2		X	
-3 dBm	-3		X	
-4 dBm	-4		X	
-5 dBm	-5		X	
-6 dBm	-6		X	
-7 dBm	-7		X	
-8 dBm	-8		X	
-9 dBm	-9		X	
-10 dBm	-10		X	
-11 dBm	-11		X	
-12 dBm	-12		X	
-13 dBm	-13		X	
-15 dBm	-15		X	
-18 dBm	-18		X	
-21 dBm	-21		X	
-24 dBm	-24		X	
-27 dBm	-27		X	
-30 dBm	-30		X	
-33 dBm	-33		X	
-36 dBm	-36		X	
Silence	SILence		X	

	Remote name	Embedded	Analog	AES/EBU
Timing				
-9.6 µs	-9.6			X
-8.8 µs	-8.8			X
-8.0 µs	-8.0			X
-7.2 µs	-7.2			X
-6.4 µs	-6.4			X
-5.6 µs	-5.6			X
-4.8 µs	-4.8			X
-4.0 µs	-4.0			X
-3.2 µs	-3.2			X
-2.4 µs	-2.4			X
-1.6 µs	-1.6			X
-0.8 µs	-0.8			X
+ 0.0 µs	+ 0.0			X
+ 0.8 µs	+ 0.8			X
+ 1.6 µs	+ 1.6			X
+ 2.4 µs	+ 2.4			X
+ 3.2 µs	+ 3.2			X
+ 4.0 µs	+ 4.0			X
+ 4.8 µs	+ 4.8			X
+ 5.6 µs	+ 5.6			X
+ 6.4 µs	+ 6.4			X
+ 7.2 µs	+ 7.2			X
+ 8.0 µs	+ 8.0			X
+ 8.8 µs	+ 8.8			X
+ 9.6 µs	+ 9.6			X
+ 10.4 µs	+ 10.4			X

6.5 Reset configuration

Whenever the SCPI command ***RST** is issued and/or the preset button on the front is used as a reset, (pressing it for more than15seconds), the actual settings will be reset according to the following:

	PAL	**NTSC**
BB1-3:		
System	PAL	NTSC
Delay	0,0,0.0	0,0,0.0
ScH-Phase	0	0
ColorBar		
Pattern	CBEBu	CBSMpte
System	PAL	NTSC
Delay	0,0,0.0	0,0,0.0
ScH-Phase	0	0
Embedded Audio	OFF	OFF
AES/EBU Audio		
System	PAL	NTSC
Signal	S1KHZ	S1KHZ
Level	0	0
Timing	0	0
Click	3	3
Wordclock	F48KHZ	F48KHZ
Analog Audio		
Signal	S1KHZ	S1KHZ
Level	0	0
Click	3	3

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