Functies:

Get/set timediv (of hetzelfde: Get/set timebase)

Get/set horizontal magnify

Per channel

* Trace (on) zichtbaar maken.
* Capture/getTrace/getWaveForm: dus het ophalen van de data alleen, inclusief alle noodzakelijke parameters, voor het plotten en/of bewerken.
* Set/get vdiv
* Get/set trigger:
  + AC/DC
  + Slope (falling/rising)
  + Level
  + Mode: auto/normal etc.
  + Noise reject etc.
* Plot : show, save en load (zie dit als algemene functionaliteit, niet een scope functie, dus hoort hier niet)
  + Plot trace
  + Plot scopescreen (screendump)
  + Save trace/plot
  + Save scopescreen (screendump)
  + Show saved trace/plot

Analyse progmanual Tektronix TDS1000 serie:

Tektronix heeft een groepering van de commando’s gemaakt, die er goed uit ziet. Zie de inhoudsopgave

Een eerste selectie van de meest interessante groepen:

* Trigger Commands
  + TRIGger Force trigger event
  + TRIGger:MAIn Set main trigger level to 50%; Query returns
  + TRIGger:MAIn:EDGE? Return edge trigger settings
  + TRIGger:MAIn:EDGE:COUPling Set or query the edge trigger coupling
  + TRIGger:MAIn:EDGE:SLOpe Set or query the edge trigger slope
  + TRIGger:MAIn:EDGE:SOUrce Set or query the edge trigger source
  + TRIGger:MAIn:FREQuency? Return trigger frequency value
  + TRIGger:MAIn:HOLDOff? Return trigger holdoff value
  + TRIGger:MAIn:HOLDOff:VALue Set or query the trigger holdoff value
  + TRIGger:MAIn:LEVel Set or query the trigger level
  + TRIGger:MAIn:MODe Set or query the trigger mode
* Vertical Commands
  + CH<x>? Return vertical parameters
  + CH<x>:BANdwidth Set or query the channel bandwidth
  + CH<x>:COUPling Set or query the channel coupling
  + CH<x>:CURRENTPRObe Set or query the scale settings for current probes
  + CH<x>:INVert Set or query the channel invert 1
  + CH<x>:POSition Set or query the channel position
  + CH<x>:PRObe Set or query the channel probe parameters
  + CH<x>:SCAle Set or query the channel volts/div
  + CH<x>:VOLts Same as CH<x>:SCAle
  + CH<x>:YUNit Set or query the units of the specified channel
  + SELect? Controls the display of waveforms
  + SELect:<wfm> Set or query the waveform display state
* Waveform Commands
  + CURVe Transfer waveform data to or from theoscilloscope
  + DATa Set or query the waveform data format andlocation
  + DATa:DESTination Set or query the destination for waveforms sent to the oscilloscope
  + DATa:ENCdg Set or query the waveform data encoding method
  + DATa:SOUrce Set or query the source of CURVe? data
  + DATa:STARt Set or query the starting point in waveform transfer
  + DATa:STOP Set or query the ending point in waveform transfer
  + DATa:TARget Same as DATa:DESTination
  + DATa:WIDth Set or query the byte width of waveform points
  + WAVFrm? Return waveform preamble and curve data
  + WFMPre? Return waveform preamble
  + WFMPre:<wfm>? Return waveform formatting data
* Horizontal Commands
  + HORizontal? Return horizontal settings
  + HORizontal:POSition Set or query the position of waveform to display
  + HORizontal:RECOrdlength? Return waveform record length
  + HORizontal:SECdiv
* Acquisition Commands
* Measurement Commands
* Display Commands

In manual worden nog veel meer groepen genoemd, die laat ik eerst even buiten beschouwing.

Een oscilloscoop kan zien als een scope object met één Horizontal object met één( of meerdere) Channel object(en) bestaande uit een Vertical (?) object en een Trigger object. Dit is dan een basis opbouw die voorziet in de basisfunctionaliteit.

Analyse progmanual Siglent SDS

-Algemeen:

* BUZZER, BUZZ
* \*IDN? DONE
* \*RST. The \*RST command initiates a device reset. The \*RST sets recalls the default setup. DONE
* \*SAV. The \*SAV command stores the current state of the instrument in internal memory. The \*SAV command stores the complete front-panel setup of the instrument at the time the command is issued. DONE
* \*RCL. The \*RCL command sets the state of the instrument, using one of the ten non-volatile panel setups, by recalling the complete front-panel setup of the instrument. Panel setup 0 corresponds to the default panel setup. DONE
* \*SRE. The \*SRE command sets the Service Request Enable register (SRE). This command allows the user to specify which summary message bit(s) in the STB register will generate a service request.
* \*STB? The \*STB? query reads the contents of the 488.1 defined status register (STB), and the Master Summary Status (MSS). The response represents the values of bits 0 to 5 and 7 of the Status Byte register and the MSS summary message.
* \*OPC? The \*OPT? query identifies the installed oscilloscope options. The response consists of a series of response fields listing all the installed options. EXAMPLE：The following instruction queries the installed options: \*OPT? Return: \*OPT RS232,NET,USBTMC
* INR? The INR? query reads and clears the contents of the INternal state change Register (INR). The INR register (table below) records the completion of various internal operations and state transitions.
* LOCK, LOCK. The LOCK command enables or disables the panel keyboard of the instrument. DONE
* MENU, MENU. The MENU command enables or disables to display the menu.
* COMM\_HEADER, CHD. The COMM\_HEADER command controls the way the oscilloscope formats responses to queries. Comm\_HeaDeR <mode> <mode> : = {SHORT, LONG, OFF}
* \*CLS: The \*CLS command clears all the status data registers.
* CMR? The CMR? Query reads and clears the contents of the Command error Register (CMR)
* CSV\_SA00VE, CSVS. The CSV\_SAVE command selects the specified option of storing CSV format waveform.
* DATE. The DATE command changes the date/time of the oscilloscope‘s internal real-time clock.
* DDR? The DDR? Query reads and clears the contents of the Device Dependent or device specific error Register (DDR). In the case of a hardware failure, the DDR register specifies the origin of the failure. DDR <value> <value> : = 0 to 65535
* \*ESE. The \*ESE command sets the Standard Event Status Enable register (ESE). This command allows one or more events in the ESR register to be reflected in the ESB summary message bit (bit 5) of the STB register.
* \*ESR? The \*ESR? query reads and clears the contents of the Event Status Register (ESR). The response represents the sum of the binary values of the register bits 0 to 7.
* EXR? The EXR? query reads and clears the contents of the Execution error Register (EXR). The EXR register specifies the type of the last error detected during execution.
* GET\_CSV,GCSV. The response to the GET\_CSV? Query indicates current waveform of CSV format. HOR\_MAGNIFY, HMAG.

Netwerk:

* COMM\_NET, CONET. The COMM\_NET command changes the IP address of the oscilloscope‘s internal network interface.

FileSystem:

* DELETE\_FILE,DELF. The DELETE\_FILE command deletes files from the currently selected directory on mass storage.
* DIRECTORY, DIR. The DIRECTORY command is used to manage the creation and deletion of file directories on mass storage devices. It also allows selection of the current working directory and listing of files in the directory.
* FILENAME, FLNM. The FILENAME command is used to change the default filename given to any traces, setups and hard copies when they are being stored to a mass storage device. FiLeNaMe TYPE, <type>, FILE, ‗<filename>‘ <type>:={ C1,C2,C3, C4, SETUP,TA, TB, TC, TD, HCOPY} <filename> : = an alphanumeric string of up to 8 characters forming a legal DOS filename.
* FORMAT\_VDISK, FVDISK
* RECALL\_PANEL, RCPN. The RECALL\_PANEL command recalls a front-panel setup from the current directory on mass storage.

-Display

* \*CLS: The \*CLS command clears all the status data registers.
* SCREEN\_DUMP,SCDP. The SCREEN\_DUMP command is used to obtain the screen information of image format .
* SCREEN\_SAVE,SCSV. The SCREEN\_SAVE command controls the automatic Screen Saver, which automatically shuts down the internal color monitor after a preset time.
* REF\_SET, REFS. The REF\_SET command sets the reference waveform and its options.
* CURSOR\_MEASURE, CRMS. Afhankelijk van scope, verschillende formaten?
* CYMOMETER, CYMT. Waarschijnlijk de frequentiemeting van het signaal op de scoop. Is onduidelijk of dit hoort bij de scoop als geheel, of dat dit een kanaal eigenschap is.
* DEFINE, DEF. The DEFINE command specifies the mathematical expression to be evaluated by a function. DEFine EQN,‘<equation>‘. Voorbeeld: Command message: DEFine EQN,'C1\*C2'
* DOT\_JOIN,DTJN. The DOT\_JOIN command controls the interpolation lines between data points.
* FFT\_WINDOW,FFTW. The FFT\_WINDOW command selects the window of FFT(Fast Fourier Transform algorithm). FFT\_WINDOW <window> <window > : = {RECT,BLAC,HANN,HAMM} RECT is short for rectangle. BLAC is short for Blackman. HANN is short for hanning. HAMM is short for hamming.
* FFT\_ZOOM,FFTZ. The FFT\_ZOOM command selects the specified zoom of FFT. FFT\_ZOOM <zoom> < zoom > : = {1,2,5,10}
* FFT\_SCALE,FFTS. The FFT\_SCALE command selects the specified scale of FFT (Fast Fourier Transform algorithm). The response to the FFT\_SCALE? query indicates current vertical scale of FFT waveform. FFT\_SCALE <scale> < scale > : = {VRMS,DBVRMS}
* FFT\_FULLSCREEN,FFTF. The FFT\_FULLSCREEN command enables or disables to display the FFT waveform full screen. The response to the FFT\_FULLSCREEN? Query. FFT\_FULLSCREEN <state> < state > : = {ON,OFF}
* GRID\_DISPLAY,GRDS. GRID\_DISPLAY <type> < type > : = {FULL,HALF,OFF}
* <exp\_trace>: Hor\_MAGnify <factor> <exp\_trace>: = {TA, TB, TC, TD} <factor> : = 1 to 2,000,000 The range of <factor> is related to the current timebase and the range of the timebase.
* HOR\_POSITION, HPOS. The HOR\_POSITION command horizontally positions the geometric center of the intensified zone on the source trace. Allowed positions range from division -7 to 7. If this would cause the horizontal position of any expanded trace to go outside the left or right screen boundaries, the difference of positions is adapted and then applied to the traces. <exp\_trace>: Hor\_POSition <hor\_position> <exp\_trace>: = {TA, TB, TC, TD} <hor\_position>: = -7 to 7 DIV
* PEAK\_DETECT, PDET. The PEAK\_DETECT command switches ON or OFF the peak detector built into the acquisition system.
* PERSIST, PERS. PERSist <mode> <mode> : = {ON, OFF}
* PERSIST\_SETUP, PESU. The PERSIST\_SETUP command selects the persistence duration of the display, in seconds,in persistence mode. PErsist\_SetUp <time>
* <time>：= {1，5，10，30,Infinite}
* PANEL\_SETUP, PNSU Command /Query
* PF\_DISPLAY,PFDS Command /Query. The PF\_DISPLAY command enables or disables to turn the test and display the message in the pass/fail option.
* PF\_SET,PFST. The PF\_SET command sets the X mask and the Y mask of the mask setting in the pass/fail option. PF\_ SET XMASK, <div>,YMASK, <div> <div> : = 0.04div~4.0div
* PF\_SAVELOAD,PFSL. The PF\_SAVELOAD command saves or recalls the created mask setting.
* PF\_CONTROL,PFCT. The PF\_CONTROL command controls the pass/fail controlling options: ―operate‖, ―output‖ and the ―stop on output‖.
* PF\_CREATEM,PFCM The PF\_CREATEM command creates the mask of the pass/fail.
* PF\_DATADIS, PFDD. The PF\_DATADIS? query returns the number of the fail ,pass and total number that the screen showing.
* HARDCOPY\_SETUP, HCSU
* INTENSITY,INTS. The INTENSITY command sets the intensity level of the grid or the trace. INTenSity GRID, <value>, TRACE, <value> <value> : = 0(or 30) to 100 [PCT]
* MATH\_VERT\_POS, MTVP Command/Query. The MATH\_VERT\_POS command controls the vertical position of the math waveform with specified source.
* MATH\_VERT\_DIV, MTVD
* MEMORY\_SIZE, MSIZ. The MEMORY\_SIZE command sets the maximum depth of memory. MEMORY\_SIZE <size> <size>:= {7K, 14K, 70K, 140K, 700K, 1.4M,7M,14M}.

-Calibratie/Setup:

* \*CAL?
* AUTO\_CALIBRATE, ACAL
* AUTO\_SETUP, ASET
* AUTO\_TYPESET <type> <type> : = {SP,MP,RS,DRP,RC}

-Trigger unit/

* AVERAGE\_ACQUIRE <time>, met <time> : = {4, 16, 32, 64,128,256,etc}
* FRAME\_PARAM, FPAR
* FRAME\_SET, FRAM. The FRAME\_SET command is used to set history current frame number.
* FORCE\_TRIGGER,FRTR. Causes the instrument to make one acquisition. Command message1: TRMD SINGLE;ARM;FRTR Command message2: TRMD STOP;ARM;FRTR
* FRAME\_TIME, FTIM. The FRAME\_TIME command is used to get current frame Acq. Time.
* ILVD. The INTERLEAVED command enables or disables random interleaved sampling (RIS) for timebase settings where both single shot and RIS mode are available.