

NAME

sig_SCDP – commands the instrument to send, reads and outputs screen-dump data in image/bmp format

sig_WF – commands the instrument to send selected waveform data and generates gnuplot-compatible x-y output

sig_DVM – reads and displays waveform measurements on the console / terminal, in the style of a Digital Voltmeter (DVM)

SYNOPSIS

sig_SCDP *equipment_IPv4_address*

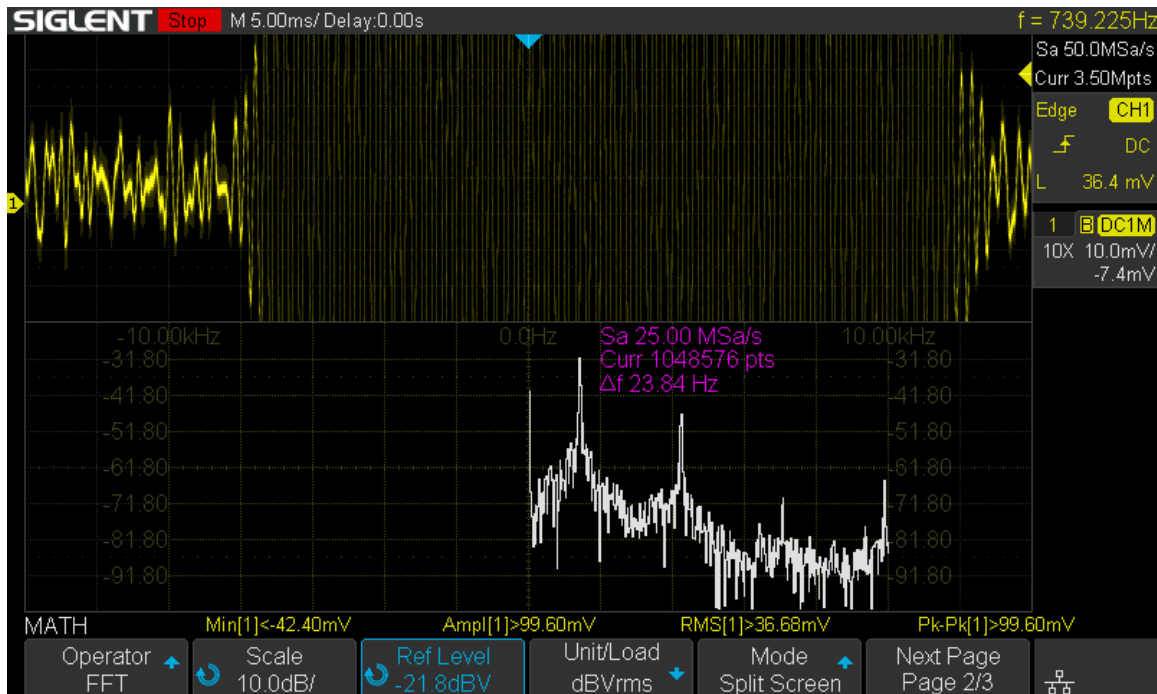
sig_WF *equipment_IPv4_address* [*Cx* | *MATH*]

sig_DVM *equipment_IPv4_address* [*Cx*]

DESCRIPTION

The utility programs access port 5025 (SPCI-RAW) at the provided instrument address to send commands and receive the requested data. Diagnostic commands are written to stderr while data goes to stdout.

sig_SCDP outputs a bitmap (BMP) file. See EXAMPLES for generating filenames with the current date and time.



sig_WF outputs the selected waveform (C1, C2, MATH) as a binary file with two values (time, voltage) in floating point format. See EXAMPLES for displaying using **gnuplot**.

sig_DVM voltage measurements of the selected waveform (C1, C2) are displayed on the console/terminal. The terminal should be adjusted to fit about 70 lines, 180 characters long.



EXAMPLES

```
./sig_SCDP 192.168.1.242 > test.bmp && display test.bmp
```

Screen dump utility test command

```
./sig_SCDP 192.168.1.242 > SCDP_`date +%y%m%d-%H%M%S`.bmp && display -resize 1600x960 SCDP_`date +%y%m%d-%H%M*`.bmp
```

Screen dump file name includes date and time in YYMMDD-HH:MM:SS format for sorting.

```
./sig_DVM 192.168.1.242
```

Displays selected C1 (Channel 1) waveform measurements (MAX, MIN, AMPL, RMS, PKPK, HZ) on the terminal, in a Digital Voltmeter (DVM) fashion.

```
./sig_DVM 192.168.1.242 C2
```

To get the corresponding measurements for Channel 2, the optional second parameter should be C2. **Note that the displayed frequency depends on the trigger source, independent of the selected channel.**

```
./sig_WF 192.168.1.242 > test.bin
```

Outputs C1 (Channel 1) data by default.

```
./sig_WF 192.168.1.242 C2 > test.bin
```

The second parameter may be C1, C2 or MATH. In this example Channel 2 data is output.

```
./sig_WF 192.168.1.242 MATH > test.bin
```

If the second parameter is MATH, the output depends of the selected mathematics operator (including FFT).

```
./sig_WF 192.168.1.242 > WF_‘date +%y%m%d-%H%M%S’.bin
```

A descriptive file name, including a time stamp may be generated as shown in this example.

WAVEFORM DISPLAY EXAMPLES USING GNUPLOT SCRIPTS

```
gnuplot -persist -e "set terminal x11 size 1800,900; \
plot 'test.bin' binary format='%float%float' \
using 1:2 with steps"
```

```
gnuplot -persist -e "set terminal x11 size 1800,900; \
set mouse format '%.8f'; plot 'test.bin' binary \
format='%float%float' using 1:2 with steps"
```

```
gnuplot -persist -e "set terminal x11 size 1800,900; \
plot 'test.bin' binary format='%float%float' \
using 1:2 smooth csplines"
```



ADDITIONAL SDS PROGRAMMING INFORMATION

The particular oscilloscope software version in use (1.3.27) includes undocumented commands and apparent shortcomings, listed here to assist the unaware. Note that these may be rectified in future software or publication versions.

UNDOCUMENTED COMMANDS (SDS1202X-E): The following working SCPI commands are not documented: *ESR? *SRE *SRE? *STB? *TST? *WAI, SYST:TIME hhmmss, SYST:DATE yyyymmdd

ERRATA (SDS1202X-E): It is advisable to use the short form of commands and queries as certain commands are not accepted by the instrument in their long form.

Reference: Siglent® SDS1000-Series, SDS2000X, SDS2000X-E Programming Guide PG01-E02D:

- p.20 *OPC? **may hang** the instrument; further requests to port 5025 will result in the connection being closed.
- p.23 command/query/response COMM_HEADER is not recognized; use CHDR
- p.52 command/query/response CURSOR_MEASURE/CRMS the manual mode must be specified as MANU (not MANUAL)
- p.52 CRMS MANU and CRMS TRACK seem to be reversed (TRACK = MANU, MANU = TRACK)
- p.52 CRMS unexpected input **may crash** the instrument (need to remove power cable to reset)
- p.78 command/query/response TRACE/TRA also works for non-digital channels (C1, C2, etc.)
- p.85 command/query/response INTENSITY/INTS only works with individual key-value pairs (e.g. ints trace,50 and ints grid,15)
- p.105 command/query/response FFT_POSITION is not recognized; use FFTP
- p.122 PAVA? CUSTx or CUSTALL returns multiple values, although only one PACU command have been entered after *RST or MEACL (e.g. PACU RMS,C1)
- p.127 PASTAT RESET does not seem to work
- p.130 MEGS? does not produce any output
- p.131 MEGA does not seem to work
- p.133 MEGB does no seem to work
- p.152 "<filename>:= A waveform file under a legal DOS path" -- should be "front-panel setup" file
- p.162 command/query/response REF_SCALE is not recognized; use REFSC
- p.173 STPN DISK,UDSK,FILE,'xxxxxxxx.xml' works under unspecified conditions (does not work all the time)
- p.200 TRPA <condition> -- there is a second OR (instead of NOR)
- p.263 trace:WF? without the DAT2 parameter or with any other text returns the result of a previous query minus the first character
- p.296 command/query/response CSV_SAVE is not recognized; use CSVS.
It is not clear how to save a waveform in the CSV format.

CONTROL AND SCRIPTING UTILITY lxi-gui and lxi by Martin Lund comprise a set of open-source programs featuring automatic instrument discovery and scripting control of LXI (LAN eXtensions for Instrumentation) - compatible instruments (<https://github.com/lxi-tools/lxi-tools>).

FURTHER DEVELOPMENT

FFT - for the purpose of plotting the MATH / FFT function a couple of assumptions were made regarding the scale and the number of frequency bins. Contributions of additional information will assist in completing / correcting the provided software.

Data in the binary output file is written as floats (%f) for **gnuplot**.

REFERENCES

Siglent® SDS1000-Series, SDS2000X, SDS2000X-E Programming Guide PG01-E02D
(https://siglentna.com/wp-content/uploads/dlm_uploads/2021/01/)

Standard Commands for Programmable Instruments (SCPI) - SCPI Consortium (<https://www.ivifoundation.org/downloads/SCPI/scpi-99.pdf>)

gnuplot is a command-line driven graphing utility for sever platforms by Thomas Williams, Colin Kelley and contributors (<http://gnuplot.info/>).

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