



USB Data Transfer with the Rigol DS1000E/D Scope

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Solution: The DS1000E/D series of oscilloscopes from Rigol can download captured waveforms containing up to 1 million data points. Here are the commands and proper order for remote retrieval of the data over USB.

There are some conventions that need to be established:

1. Braces { }

The parameters enclosed in a command line must be selected. When several elements separated by a vertical line (|) are enclosed by braces, { }, only one element may be selected, for example:

:MEASure:TOTal {ON|OFF},

Thereinto, {ON|OFF} indicates that only ON or OFF may be selected, not both.

2. Square Brackets []

Items enclosed in square brackets [] are optional, for example:

:TIMebase[:DELayed]:OFFSet <offset>

Thereinto, [:DELayed] could be omitted.

3. Triangle Brackets < >

Items enclosed in < > should be replaced by an effective value, for example:

:DISPlay:BRIGhtness <ncount>

Thereinto, < ncount > must be a numerical value such as 25.



1. Set memory depth:

:ACQuire:MEMDepth <depth>

Where <depth> can be **LONG** or **NORM**. For actual data depth, see Table 1 below.

2. Set the waveform points mode:

:WAVeform:POINts:MODE <points_mode>

Where <depth> can be **NORM**, **RAW**, or **MAX**

See table 1 below for data points returned in each mode.

3. Set Scope operation mode:

:RUN or **:STOP**

4. Return data:

:WAVeform:DATA? <source>

Where <source> can be **CHAN1**, **CHAN2**, **DIG** (For D series only), **MATH**, or **FFT**

NOTE: The first time you run the “:WAVE:DATA?” command, you will return 600 points. To return more points, you will need to operate the scope in “:STOP” mode.



Data points returned by **:WAVEform:DATA?** in different modes:

| | NORmal | RAW | | MAX |
|--------------------------|---------------|---------------|--------------|---|
| | | Normal Memory | Long Memory | In RUN state, MAX is the same with NORMal ; in STOP state, MAX is the same with RAW . |
| MATH | 600 | 600 | 600 | |
| FFT | 512 | 512 | 512 | |
| CHx | 600 | 8192(8k) | 524288(512k) | |
| Half-Channel CHx* | 600 | 16384(16k) | 1048576(1M) | |
| DIGITAL | 600 | 16384(16k) | 1048576(1M) | |

***Note:** Half-channel means only one channel is open and the MATH is closed.

Table 1: Data points return table per DS1000E/D Programming Guide, Sept. 2010.

Example: Here is the command set to return 1M points from channel 1.

NOTE: It may be helpful to insert a wait or sleep between commands to prevent communications errors. Typically, a 10-20ms is sufficient.

1. Send **“:ACQ:MEMDEPTH LONG”**
2. Send **“:WAVEform:POINTs:MODE MAX”**
3. Send **“:RUN”** to acquire waveform of interest. Once you have capture your waveform, continue to step 4.
4. **OPTION:** It may be useful to use the Single Trigger mode by sending **“:TRIG:SING:MODE”**
5. Send **”:STOP”**
6. Send **”:WAV:DATA? CHAN1”**
7. Retrieve data from step 4.
- *Remember, this first iteration will only return ~ 600points.**
8. Rerun steps 4, 5.