Instructions on Using Tektronix TDS8000 or TDS8200

Prepared by Haihui Zhang Oct. 25 2018, Revised 1/9/2020

***** Data transfer from TDS8200 to PC *****
Saving data directly into 3.5" floppy disk may not be reliable. If you save data directly to FD, FD may not save the complete data. The best method is to save data into Disk C on TDS8200 (Windows Desktop). When you exit TDR app (File menu), you will see the regular Windows Desktop with your data. Then transfer to a 3.5" floppy disk. PCs in Rm419 have 3.5" floppy drives so that you can transfer your data into any computer.

Currently USB port is not operating.

***** Time information *****
The number of points and sample rate can be found in Setup. Click Setup then check Horizontal. The default is 4000 points.

The Tektronix TDS8000 and TDS8200 is a Digital Sampling Oscilloscope for obtaining, sampling, and analyzing signals containing a total of eight channels with many options. This document is written for new users who are not familiar with the oscilloscope as a simple user manual or guidance on how to operate this system.

This document will cover on:

Starting up and turning off
Navigation Buttons Panel
Setting Up
Taking Screen Shot
Saving Data
Analyzing Data on Excel

Note: A few of the pictures are a little blurry, sorry about that my camera phone isn't that good.

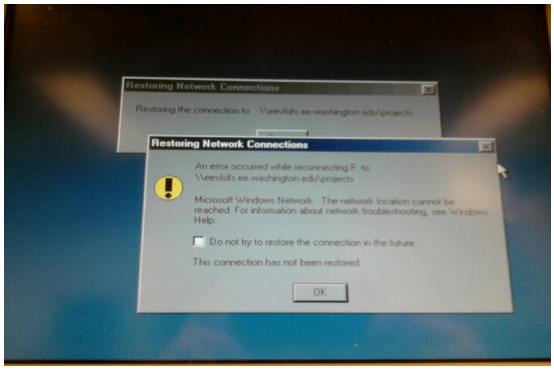
Starting up and Turning off

In general, a Digital Sampling Oscilloscope will look like the picture shown on Figure 01. Before turning on the oscilloscope, a sampling module, shown on Figure 02, must attached on the oscilloscope before turning on the power switch like Figure 01. To turn on the system, press the power button which is located on the lower left corner of the screen panel. The oscilloscope has touch screen ability when the **TOUCH SCREEN** button is enabled. Mostly a mouse and a keyboard are used on the oscilloscope to avoid the screen from too much finger prints.

When turning of the Digital Sampling Oscilloscope, don't press the power button to turn off the system. Doing that will damage the windows operating system inside the oscilloscope, the proper way to turn off the oscilloscope is first close all programs that is running on the system. Then go to: **START** -> **Shut Down** -> **Ok**.

While the oscilloscope is starting, there might be pop up errors as shown on Figure 03 and Figure 04. When that happens, click the X, located on the upper right corner, to ignore the errors. When the system has completely finished startup, the screen panel will look like Figure 05 or Figure 06.

Figure 01: A TDS8200 Digital Sampling Oscilloscope
Figure 02: A Sampling Module



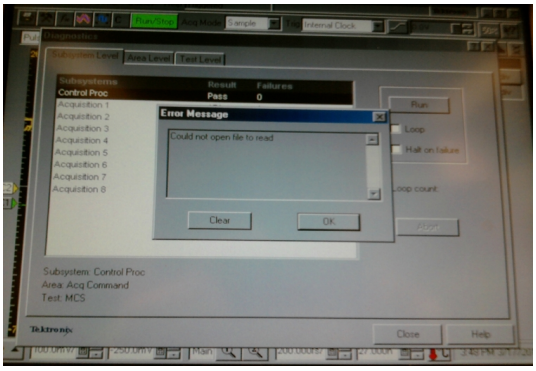
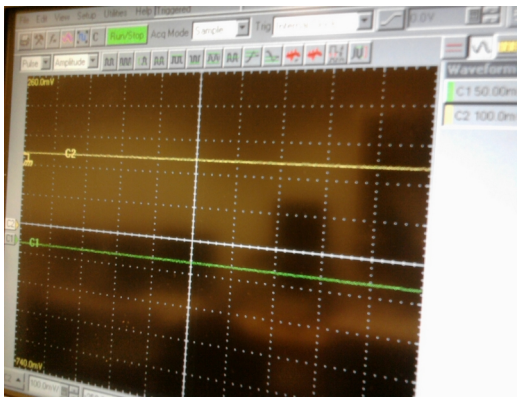


Figure 03: Error messages might appear during startup
Figure 04: Error messages might appear during application startup



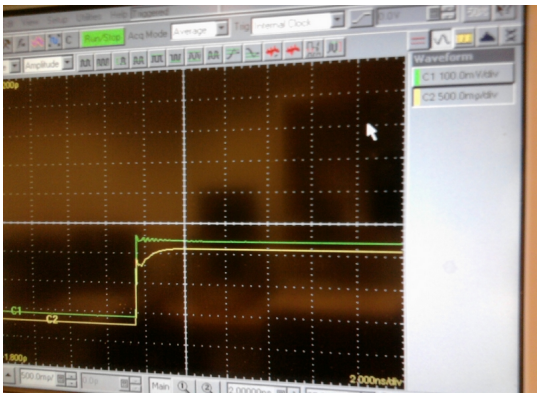


Figure 05: Sample with Trig = External Prescaler
Figure 06: Sample with Trig = Internal Clock

NOTE: If there is no signal and no channels are enabled, go enable channel 1 and channel 2. If both channels are enabled and still there are no signals, press the **SETUP DIALOGS** button located on the navigation buttons panel on the right and go to **TDR** tab. Under the tab click **Diff** for channel 1 and channel 2, by clicking that it will enable channel 1 and channel 2 signals for comparing.

Note: When only one input signal is needed, set Channel 1 TDR tab ON and leave others OFF.

Navigation Buttons Panel

The Navigation Buttons Panel is located right side of the sampling oscilloscope as shown on Figure 01 and Figure 07. In this section, some of the useful buttons and nobs will be discussed because showing and discussing all the maneuvers in detail will require lots of time.

SETUP DIALOGS:

Pressing this button will bring up the Setups window. The Setup window consists of 12 tabs: Vert, Horz, Acq, Trig, Wfm Database, Hist, Cursor, Meas, Phase Ref, Mask, TDR, and Disp.

PRINT:

This will print a screen shot of a signal waveform. It has the option to let the user to choose whether to print the waveform to a printer or to a picture file.

CURSORS:

Two vertical or horizontal bars appear that lets the user to take measurement

SELECT:

This button allows the switching between cursor 1 and cursor 2.

CURSOR NOB:

The NOB moves a selected cursor to move left and right.

VERTICAL SECTION

CH:

The channel button indicates that any channel is either ready to use or already active.

1 – 8:

Each number represents a channel. A channel is activated when a button is pressed.

SCALE NOB

This adjusts the voltage per division.

ACQUSITION SECTION

RUN/STOP

If pressed, the signal will run. Signal pu

HORIZONTAL SECTION

Number of points:

SCALE NOB

Allow the user to adjust the timing of the signal to a value per division.

TRIGGER SECTION

TRIG'D – the signal is running and ready to be triggered.

Figure 07: Navigation Buttons Panel

Setting Up

On the upper left of the Navigation Buttons Panel, there is a SETUP DIALOGS button. When the button is pressed a Setups window dialog box will appear. In there, the users are free to adjust to desirable settings.

TDR setup

From Setups choose TDR and click Ch1 to turn on TDR function (Red LED should appear on the sampling unit). The unit to show is ρ (reflection coefficient). If you need to use Ch2, click Ch2 and turn on TDR function.

Ver: Vertical scale

The vertical scale shows the reflection coefficient ρ. The following photo shows 500mρ/div.

Horz: Time scale

The horizontal scale and time resolution can be set her. This example shows the time resolution of 10ps. The resolution value can be controlled by adjusting the scale and Record length (2000 points in this case). When you saved data, the time axis is not saved. You need to create it using the time resolution and number of points.

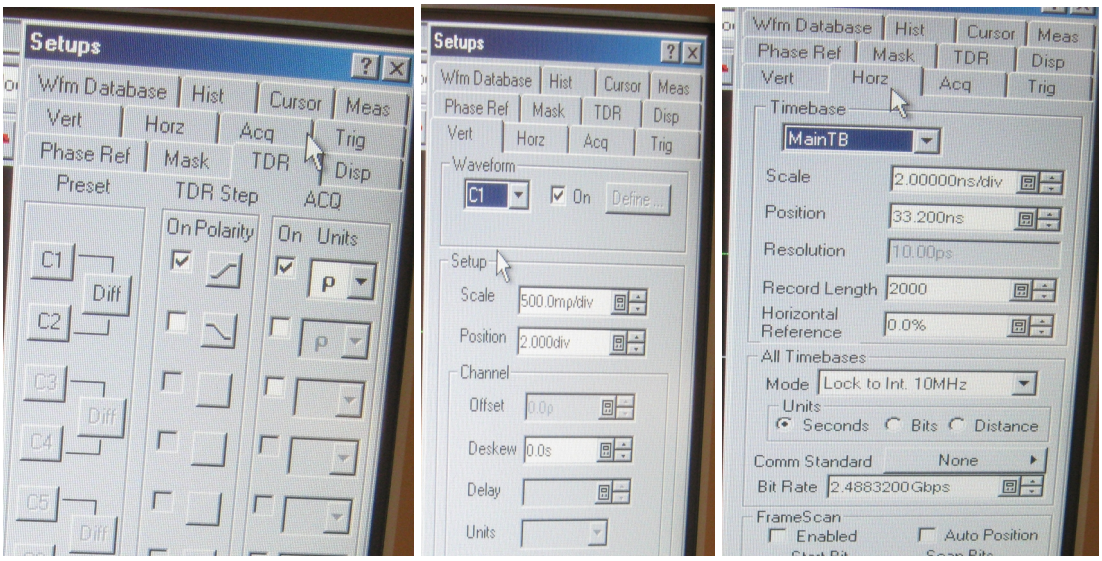


Fig.*: Screen shots of TDR, Ver, Hor functions

Other parameters to adjust are

Acq: Single or Average

Single shot or average of ** samples (16 is used here). If the signal is noisy, use the average setting.

Cursor

Can be used to show the accurate vertical and horizontal values.

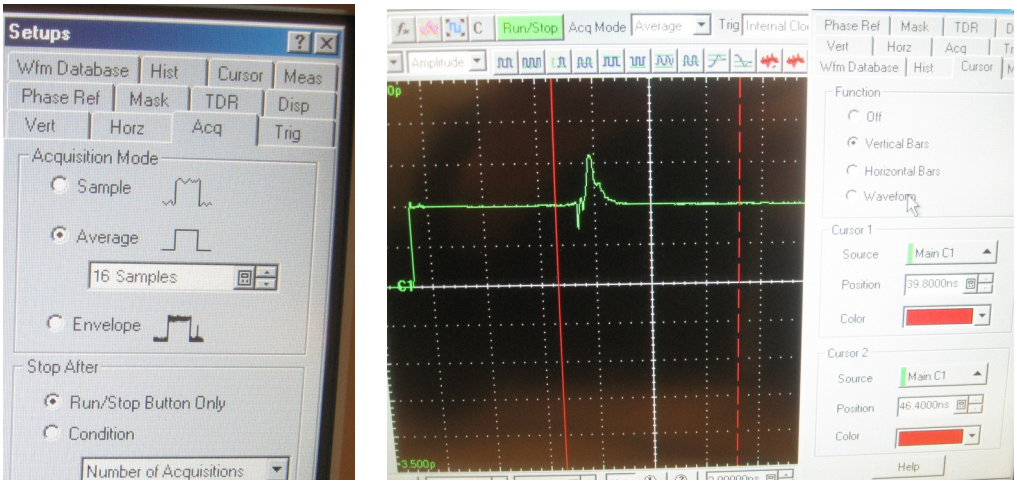


Fig.*: Screen shots of Acq and Cursor

Taking Screen Shot

Being able to capture a snap shot of signals is a must option for users because they will be able use the picture on their report or for a later recall. The Digital Sampling Oscilloscope has the

option to let the user save screen shots to a floppy drive or an external flash driver (usb) as shown on Figure 08 and Figure 09.

Figure 08: Floppy Disk Option

Figure 09: USB Flash Drive Option

To take a screen shot of a signal or signals press the **PRINT** button on the Navigation Buttons Panel. Be sure to insert a floppy disk or a USB before saving anything. When the button is pressed, a Print pop-up window will appear look like Figure 10. To save a screen shot, give a check to the box that says "Print to file." Now press the Ok button on the Print window, this will bring up a "Print to File" window, Figure 11, which allows the user to rename the file and to select where to save the screen shot to. After that is all done, press save button on the "Print to File" window to perform the process of saving.

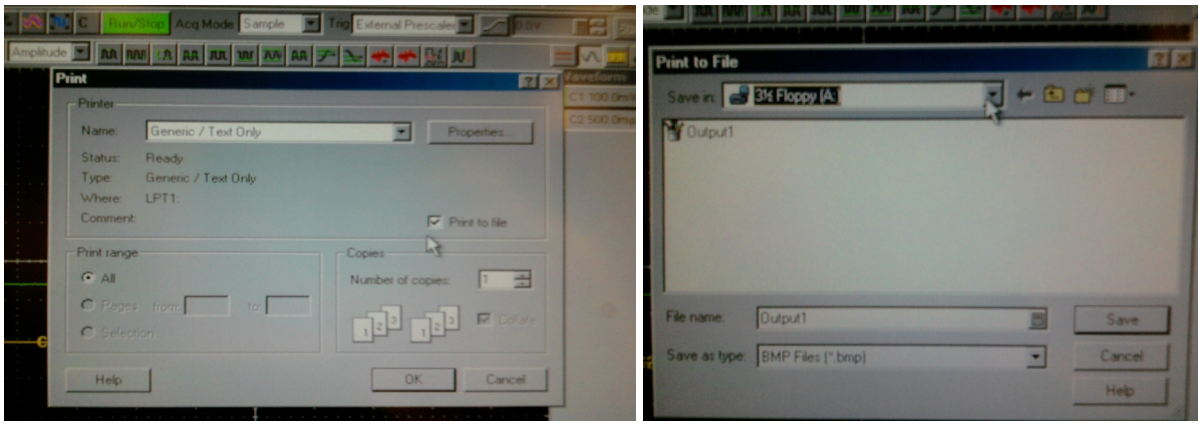


Figure 10: Print window and Print to File window

Figure 11: Screen shot file. Channel 1 is displayed.

Saving Data

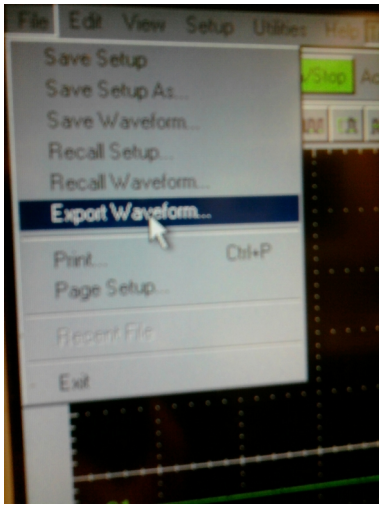
***** Data transfer from TDS8200 to PC *****

USB does not work. Also saving data directly into 3.5" floppy disk may not be reliable. The best method is to save data into Disk C on TDS8200. Then transfer to a 3.5" floppy disk. Some PCs in Rm419 have 3.5" floppy drives so that you can transfer your data into any computer.

Being able to use a signal or signals data generated by the oscilloscope on to excel is another crucial option for the user. This option will allow the user to analyze the data in a excel document.

To save data on to a floppy drive or USB, first go to File menu and click on Export Waveform as shown on Figure 12. When Export Waveform is selected an "Export" pop-up window will appear. On the Export window, there is a little square located on the lower right. Clicking on that brings up a "Browse for Folder" window allowing the user to choose a destination to save the data to. (Figure 13)

After selecting the desire destination, choose a signal and click Export button to save the data to a dot txt (text) file. (Figure 14)



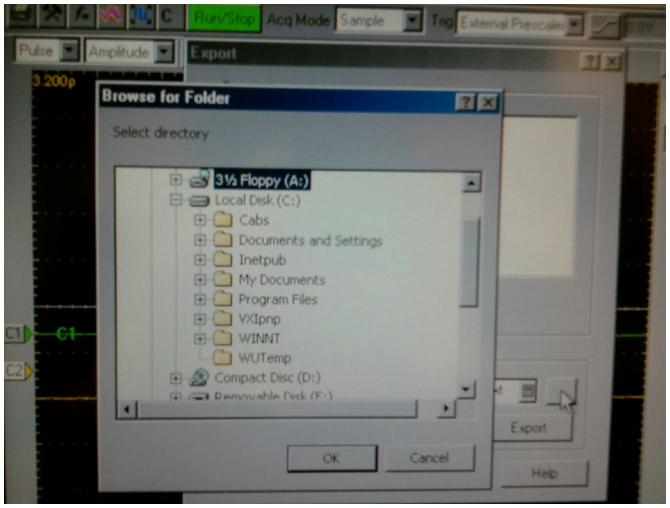


Figure 12: Export Waveform. Bowsing to a desire location

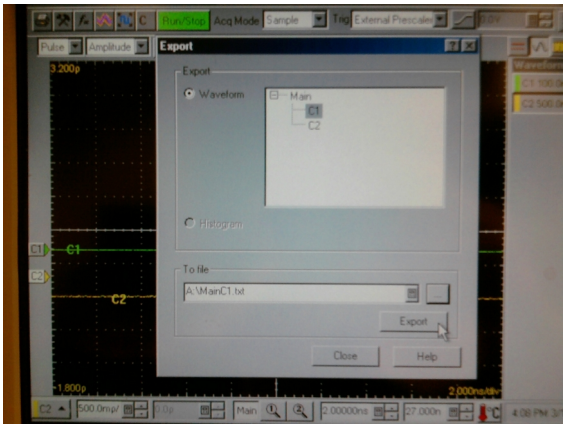


Figure 14: saving or export signal data

Analyzing Data on Excel

After obtaining a data txt file the digital sampling oscilloscope, a user might need to analyze the data points. Since txt file is just a simple text document that stores the values of the data, analysis can't be performed on it. To perform an analysis on the data, the prefer program is Microsoft Excel Document which is usually good for data analysis. To do this, the txt file will need to convert to a excel file type which is ".csv". For the conversion, right click on the txt file and rename the ".txt → .csv". (Figure 15) This will change the txt file icon to an excel file icon.

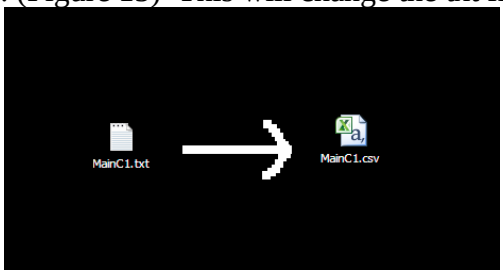


Figure 15: converting a text file to an excel file

One example for data analysis on excel is plotting the data points to a chart. The first step is to open the file by double clicking on it which the data values inside it will be in a row. The next step is to select the entire row 1 by clicking on the number 1; this will highlight the whole row. Next go to on the Insert menu tab and click on Line, it will give a dropdown box options. Choose Line under the 2D line option on the dropdown box. (Figure 16) The complete chart which represents the signal combing of data points is automatically generated as shown on Figure 17. The chart can be use for analysis or use on a report.

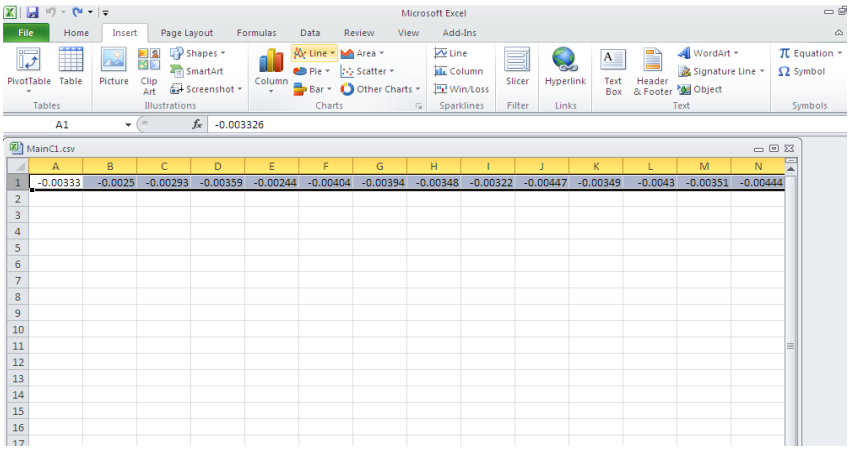


Figure 16: An excel file with data point on row 1

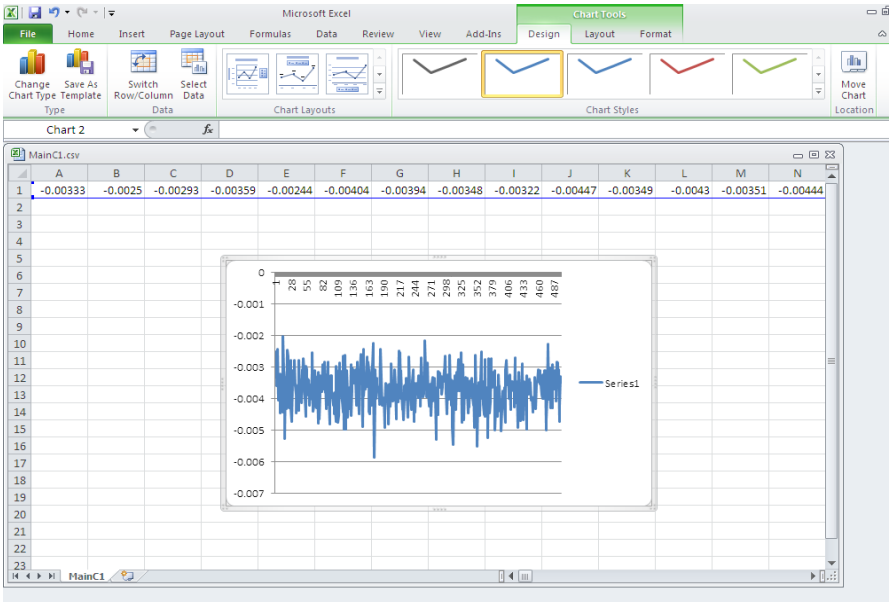


Figure 17: A complete chart representing a signal