

ScopeMeter® Test Tool CSV files available for FlukeView® software and Microsoft® Excel®

Application Note

Introduction

Capturing critical waveform information to be used as a comparison reference point, or for further detailed analysis is an important task when troubleshooting electronic systems or performing preventative maintenance. Obtaining and transferring that information to a PC hasn't always been a simple routine. The recently introduced new 190 Series II ScopeMeter Test Tool® firmware version 11.1 simplifies the process, making the transfer of critical data (using CSV files and a common USB flash drive) faster and easier than ever so the

acquisition can be done in the field without a PC, and the analysis can take place back in the office.

This application note describes how to store and open CSV files using a USB flash drive and the usage of CSV files in Flukeview software and MS Excel. For this study the Fluke ScopeMeter test tool 190 Series II was used and measurements were carried out on the incoming mains (voltage and current) of a Motor & Drive module where Channel A was selected to measure the voltage and Channel B was set-up to measure the current.

Save a file in CSV format

A measured waveform (typical values) such as shown in Figure 1 can be easily saved in a CSV format. The procedure is as follows:

- Insert a USB flash drive into the ScopeMeter test tool
- Press the "SAVE" button on the ScopeMeter test tool
- Press F1 (save)
- Press F1 to select memory USB
- From the screen: "Save to USB"
- Select "Data as .CSV to USB" (Figure 2)
- Press "ENTER" (Figure 3)

Use the virtual keypad to give the file a unique name. In this case the default filename "SCOPE 1" is chosen (Figure 4):

- Press ENTER

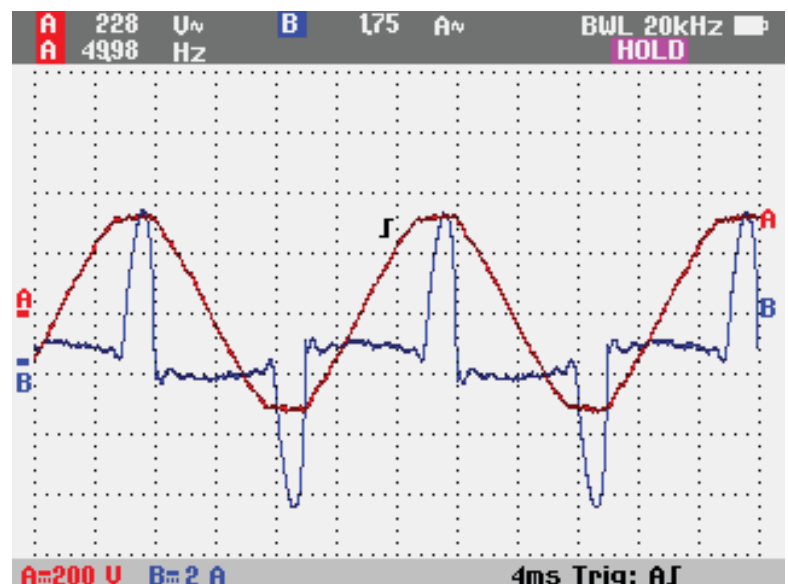


Figure 1

- The file SCOPE 1.CSV is now stored on the USB flash drive. It is recommended to use a USB flash drive with a capacity of 2GB or less
- Remove the flash drive and insert it in the PC

Open a CSV file

In the next section we will discuss how to use FlukeView software and MS Excel to transfer, store and analyze a captured waveform.

Using FlukeView

The "SCOPE 1" file can now be opened by FlukeView software for further use:

- Start FlukeView for ScopeMeter test tools
- Select "File"
- Select "Open"
- Select the correct "USB drive"
- Open the directory named "Fluke"
- Open the subdirectory "STORE"
- Click on the name "SCOPE 1"

By clicking on this file, FlukeView software will automatically display the measured data.

By default FlukeView software displays two or more channels as separate waveforms. In this example the waveforms measured on Channel A (Figure 5) and Channel B (Figure 6) are displayed.

Both waveforms can be overlaid into a single view by using the "copy and paste" or "drag and drop" functions. Figure 7 shows this final result.

SAVE			
Save to USB:	Used #	Used kB	Free kB
Screen + Setup	2	529	
Replay + Setup	3	876	125720
Data as .CSV to USB	7	11200	

MEMORY INT **USB** CLOSE

Figure 2



Figure 3

SAVE AS			
Save As:	a b c d e f g h i j k l m		
SCOPE 1	n o p q r s t u v w x y z		
OK SAVE	A B C D E F G H I J K L M		
SET DEFAULT	N O P Q R S T U V W X Y Z		
	0 1 2 3 4 5 6 7 8 9 ? ! -		
	. , + - < # % & : SPACE		

EDIT NAME MEMORY INT **USB** MEMORY INFO CLOSE

Figure 4

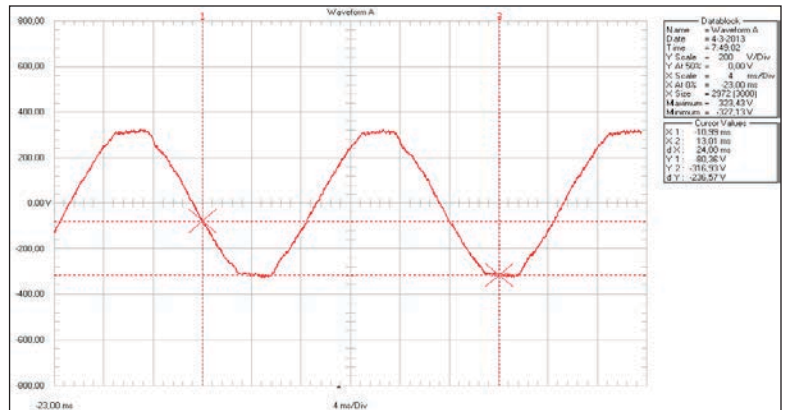


Figure 5

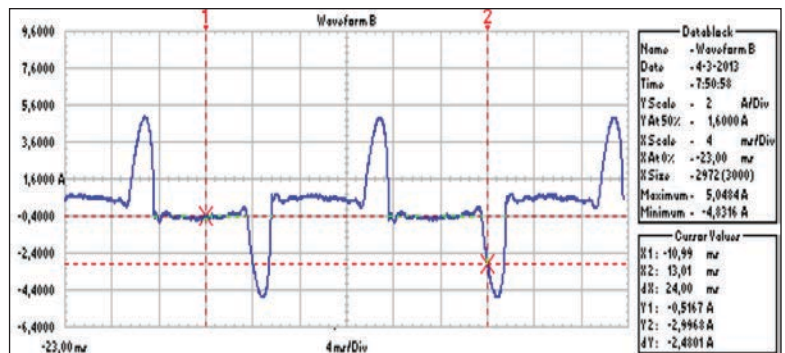


Figure 6

Initially FlukeView software labels both waveforms with the same color. In this example the waveforms have different colors, which can be easily achieved through the following process:

- Right click somewhere in the FlukeView software waveform area, which will open the following menu. See figure 8
- Select Colors as marked by the arrow
- This will open a sub-menu from which the colors for individual elements can be selected (e.g. green for waveform 1, blue for waveform 2). See figure 9

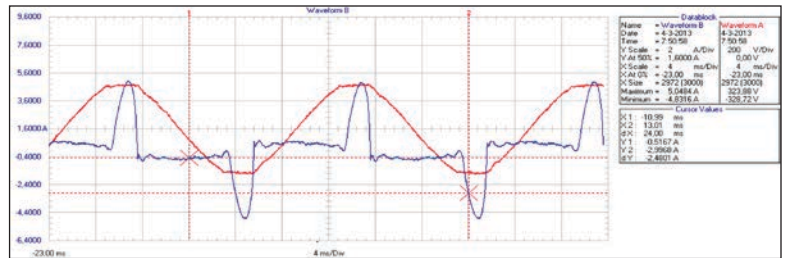


Figure 7

The data is displayed like another reading and can now be used for further analysis and archiving using the FlukeView software features.

Using MS Excel

Importing CSV data into MS Excel.

Opening a saved CSV file can be done in the following way:

- Open MS Excel with a blank worksheet
- Select "DATA" tab
- Select "FROM TEXT" (Figure 10)
- Click on next (Figure 11)
- Select "Comma" (Figure 12)
- Click on next

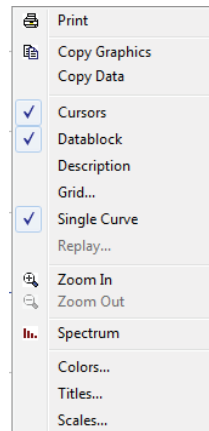


Figure 8

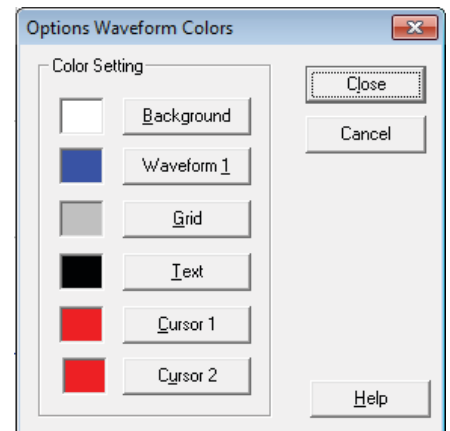


Figure 9

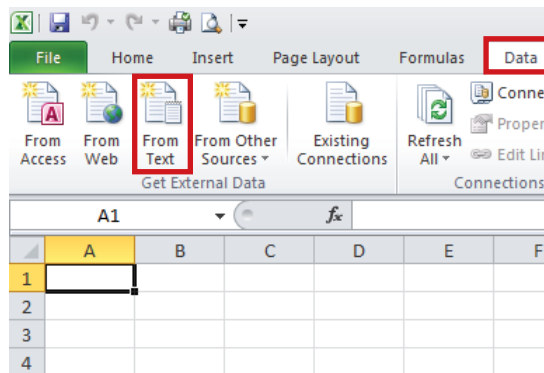


Figure 10

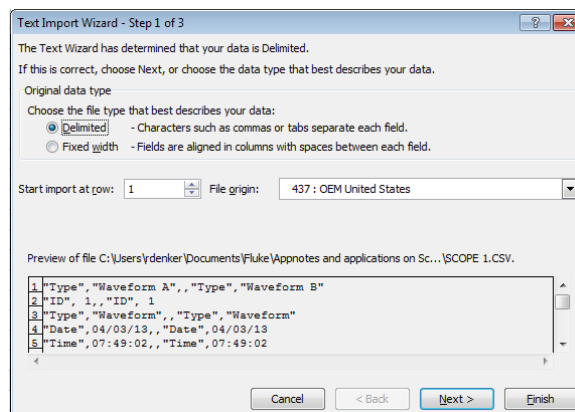


Figure 11

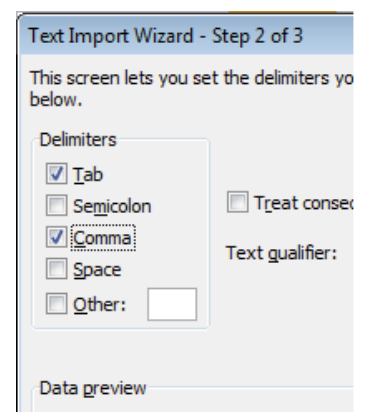


Figure 12

- Select the default location of the file you want to open (Figure 13)

Figure 13 shows the fields and data that is imported. For the sake of convenience an “explanation of the terms” used in the various columns is added in the right-hand column.

				Explanation of imported data
Type	Waveform A	Type	Waveform B	Waveform label generated by FlukeView
ID	1	ID	1	Identification
Type	Waveform	Type	Waveform	
Date	3/4/13	Date	3/4/13	Date and Time when
Time	7:49:02	Time	7:49:02	waveform was acquired
X Scale	4.00E-03	X Scale	4.00E-03	Number of units per division
X At 0%	-2.34E-02	X At 0%	-2.34E-02	This field contains the value that corresponds with the most left (vertical) grid line
X Resolution	2.50E+02	X Resolution	2.50E+02	This value represents the distance between two consecutive sample values
X Size	3000	X Size	3000	Record Length
X Unit	s	X Unit	s	Horizontal Unit
X Label	4.0ms/Div	X Label	4.0ms/Div	Horizontal time base setting
Y Scale	2.00E2	Y Scale	2.00E0	Number of units per division
Y At 50%	0.00E+00	Y At 50%	1.60E+00	This field contains the value that corresponds with the lowest(horizontal) grid line
Y Resolution	3.14E+03	Y Resolution	3.17E+03	This value represents the step between two consecutive sample values
Y Size	65536	Y Size	65536	Number of possible Y values
Y Unit	V	Y Unit	A	Vertical Unit
Y Label	Volts	Y Label	Amperes	Vertical Scale
Version V11.10		Version V11.10		Firmware version
Column A	Column B	Column C	Column D	
Time in sec	Voltage	Time in sec	Current	
-2.34E-02	-1.52E+02	-2.34E-02	5.63E-01	
-2.34E-02	-1.56E+02	-2.34E-02	5.43E-01	
-2.34E-02	-1.54E+02	-2.34E-02	5.22E-01	

Figure 13

Turn data into a waveform

The above layout can now be used to convert the data into graphs.

In this example the data from Channel A (Voltage) given in column B and Channel B (Current) given in column D will be used.

The following steps should be taken:

- Select all values in "column B", starting from the data points
- Select TAB "Insert"
- Select "Line" "2D line solid"

Figure 14 shows the result.

In the same way the values for column D can be turned into a waveform. The result is shown in Figure 15.

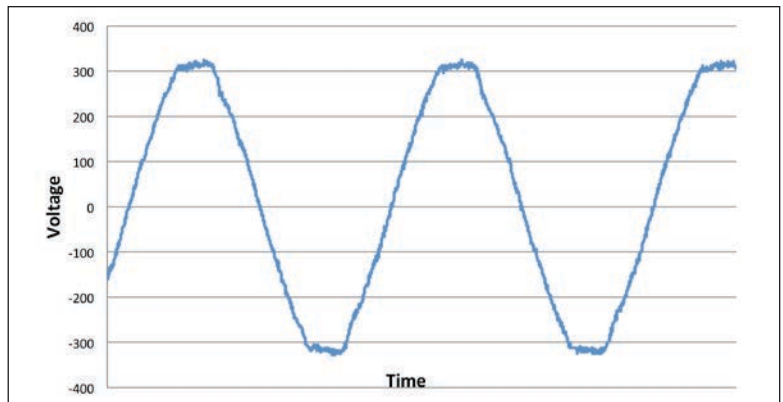


Figure 14

Mathematical calculations

Where numerical values are available, mathematical functions can be applied.

In this example the power can be calculated and displayed by multiplying the value for voltage by the value for current.

The following steps should be followed to calculate the new values and convert the data into a graph:

- Multiply the values given in Column B and D and write the result in a new column
- Select the new values and convert them into a waveform graph in the same manner that was previously explained

The new waveform is shown in Figure 16.

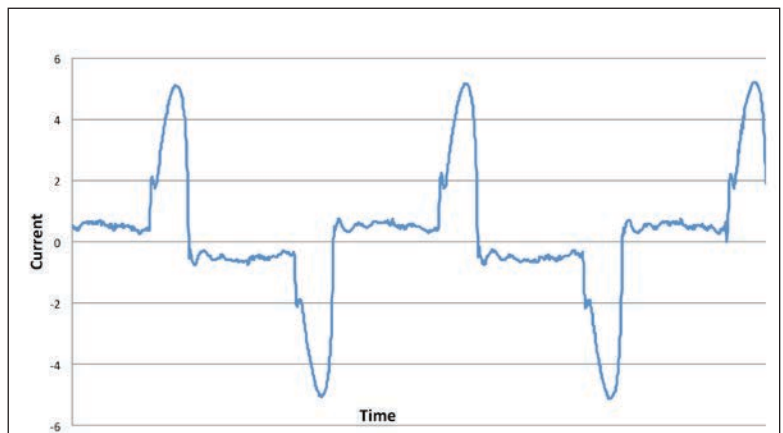


Figure 15

Conclusion

By following these simple steps, analyzing critical waveform data is now easier than ever. The ability to save and export CSV files allows users full flexibility whether using the stand-alone FlukeView software package or Microsoft Excel, and allows critical data to be archived outside the ScopeMeter test tool for further analysis.

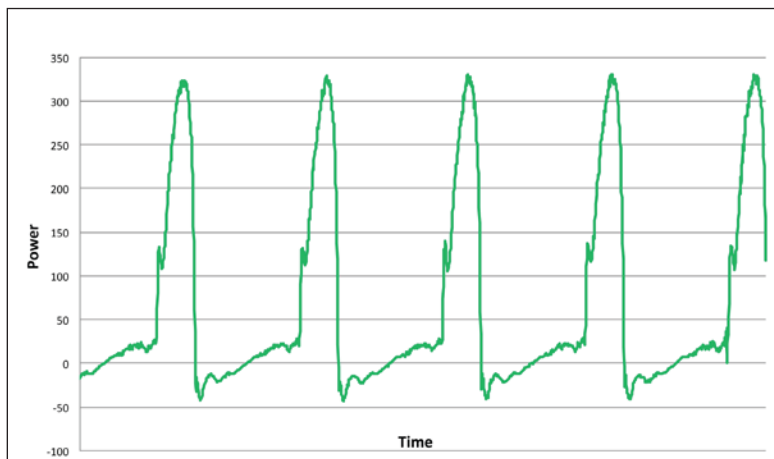


Figure 16

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Fluke Corporation

PO Box 9090, Everett, WA 98206 U.S.A.

Fluke Europe B.V.

PO Box 1186, 5602 BD Eindhoven, The Netherlands

For more information call:

In the U.S.A. (800) 443-5853 or

Fax (425) 446-5116

In Europe/M-East/Africa +31 (0) 40 2675 200 or

Fax +31 (0) 40 2675 222

In Canada (800)-36-FLUKE or

Fax (905) 890-6866

From other countries +1 (425) 446-5500 or

Fax +1 (425) 446-5116

Web access: <http://www.fluke.com>

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