Capture Uploading and Waveform File Format

DSO 068 features capture raw data uploading. This gives users an easy way to collect data and transfer to PC for storage or further processing. This article explains how to use this feature and the file format used to store waveforms.

1. Performing Date Upload

In order to transfer data from oscilloscope to PC you need a piece of communication software that supports XModem protocol. There are lots of such software available. One of the most commonly seen is the HyperTerminal found in most Windows systems. But in this article we picked another one, Tera Term, as an example. The reason is it is more straightforward and easier to use. You can download Tera Term at http://ttssh2.sourceforge.jp/index.html.en or at JYE Tech website http://www.jyetech.com/Support/Drivers&Tools.php. Install Tera Term to your system and you are ready to go.

1) **Connection** First connect DSO 068 to an USB port on PC with cable.
2) **Setup PC** Start Tera Term. Setup serial port by clicking on "Setup -> Serial port" (Fig. 1). The serial port setup window shows (Fig. 2). You need to know the port number that connects your scope. If you don't find it out by going to Windows device manager. Then select the port from the pull-down list. Set port parameters to 115200 bps baudrate and 8-N-1 data format as indicated in Fig. 2.

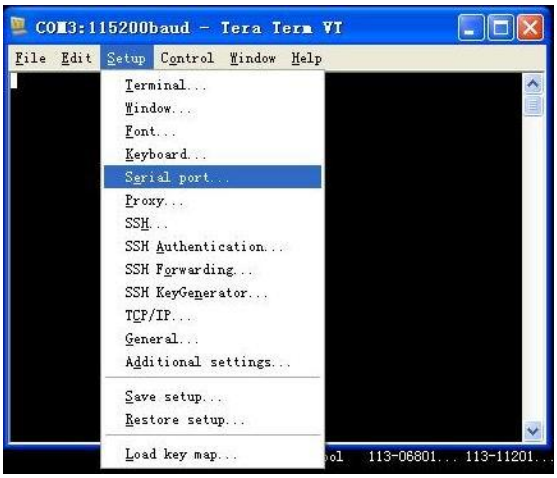


Fig. 1

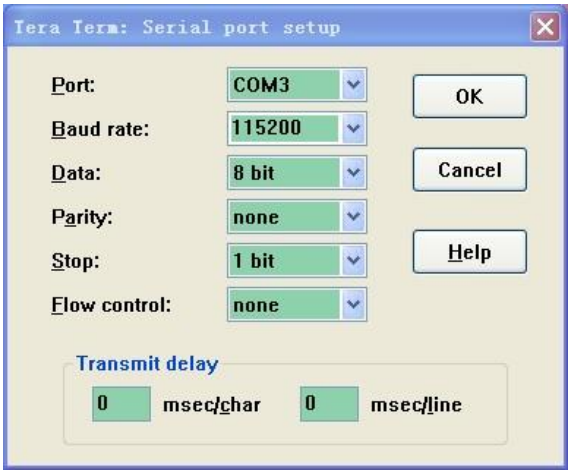


Fig. 2

3) **Prepare data to be uploaded** You can do uploading on newly captured data as well as on pre-saved data. For newly captured data put scope in RUNNING state to perform data capture. If necessary use NORMAL or SINGLE trigger mode to catch data that is hard to catch. Put scope in HOLD state once data of interest obtained. Proceed to step 4) to do upload.

   For pre-saved data recall them from EEPROM. Because DSO 068 automatically enters HOLD state after recalling you don't need to do anything but go to step 4) to continue.

4) **Start Sending** Push [ADJ] to bring up menu. Scroll to the item "SEND WAVE DATA" and push [ADJ] to start sending (Fig. 3). Scope will show "Sending data …"

(Fig. 4). Actual transferring is not really started at this point. XModem is a "receiver driving" protocol. The scope is now waiting for request from host. It will wait for about 15 seconds. If no request detected it will report sending failure and return to menu state.

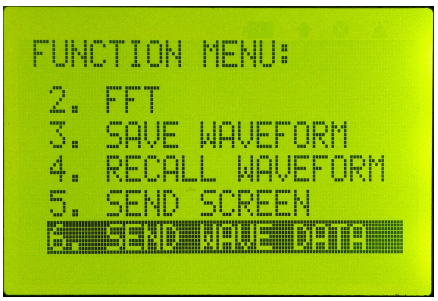


Fig. 3

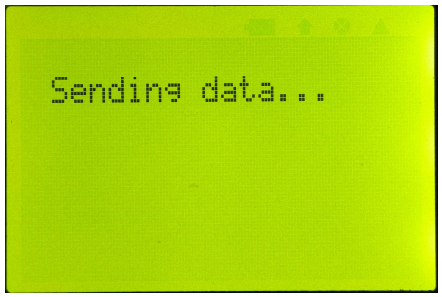


Fig. 4

5) **Start Receiving** At Tera Term select "File -> Transfer -> XMODEM -> Receiver" (Fig. 5). This will open a dialog allowing you to name the file for the coming in data and to select the folder to store it. Remember to name the file with "CSV" extension as in Fig. 6 (if you forget to do so here you can always rename it after uploading). Select option "Checksum" or "CRC" and keep "Binary" checked. Then click Open. If connection is good you should see transfer finishes in seconds.

The scope will exit menu state if transfer is successful. Otherwise it will stay in menu state. You can retry transferring again.

6) **Verify** Go to the folder received data was stored and check the file with Excel of text reader.

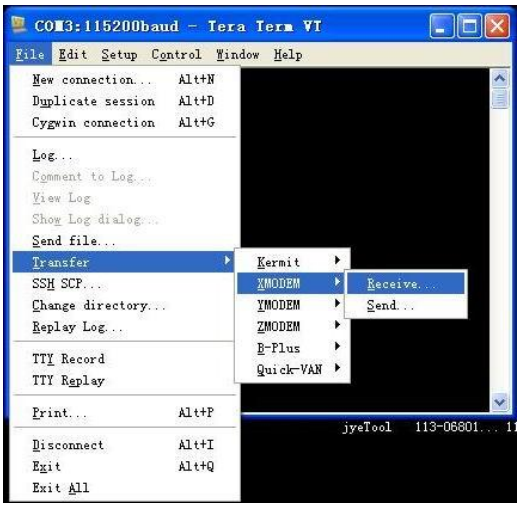


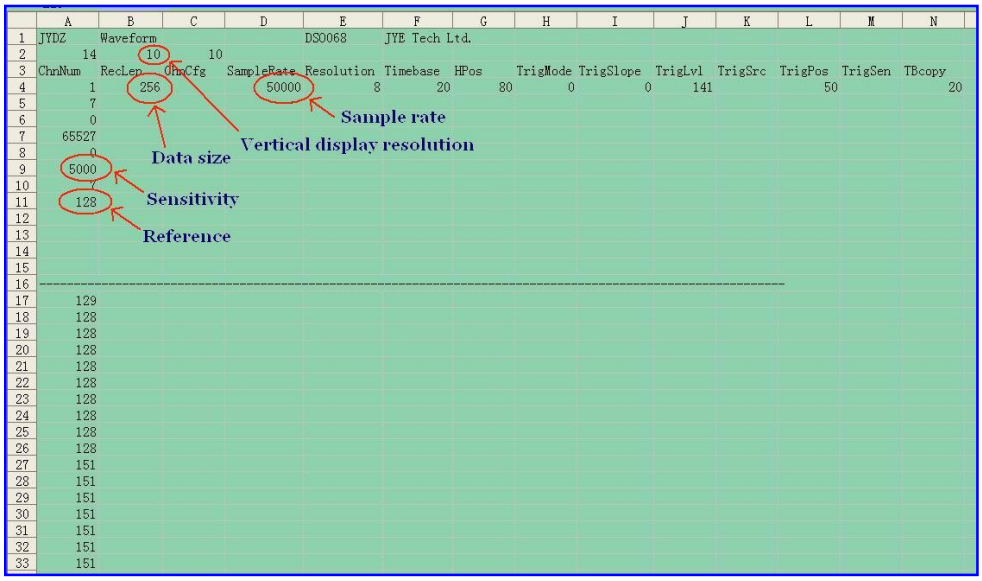
Fig. 5

Fig. 6

Note that if scope is in RUNNING state and you push [ADJ] to do uploading, the last completely captured and displayed waveform before you press [ADJ] will be uploaded.

2. Waveform File Format

CSV file is actually text file. So it can be opened by any text reader. This type of file is composed of LINES（“Records”）terminated by ‘new line’ character (0x0A, ‘LF’). Each line is composed of fields usually delimitated by commas. Each field is a ASCII coded string.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	JYDZ	Waveform			DSO068	JYE Tech Ltd.								
2	14	10	10											
3	ChnNum	RecLen	ChnCfg	SampleRate	Resolution	Timebase	HPos	TrigMode	TrigSlope	TrigLvl	TrigSrc	TrigPos	TrigSen	TBcopy
4	1	256		50000	8	20	80	0	0	141		50		20
5	7													
6	0													
7	65527													
8	0													
9	5000													
10	7													
11	128													
12														
13														
14														
15														
16	----------													
17	129													
18	128													
19	128													
20	128													
21	128													
22	128													
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24	128													
25	128													
26	128													
27	151													
28	151													
29	151													
30	151													
31	151													
32	151													
33	151													

Fig. 7

Fig. 7 illustrates the internal structure of a waveform file uploaded by DSO 068. This file was opened with Excel. Each row is a line. Each column corresponds to a field. You don’t see commas because Excel had made them hidden.

Line 1 to 16 form the waveform file header. The meanings of fields are defined below.

Line 1:

Field	Definition
1	File ID. Must be “JYDZ” for correct processing by JYE Tech software
2	Data type.
3	Date (optional)
4	Time (optional)
5	Device model (optional)
6	Manufacturer (optional)

Line 2:

Field	Definition
1	Number of fields in line 3 and 4
2	Vertical display resolution
3	Horizontal display resolution

Line 3: Line 3 is the titles of corresponding fields in line 4.

Line 4:

Field	Definition
1	Number of channels
2	Record length (bytes)
3	Channel configuration
4	Sample rate (samples/second)
5	Vertical capture resolution (bits)
6	Timebase
7	Horizontal position
8	Trigger mode
9	Trigger slope
10	Trigger level
11	Trigger source
12	Trigger position
13	Trigger sensitivity
14	Timebase (duplication of field 6)

Line 5: Vertical sensitivity

Line 6: Couple

Line 7: Vertical position

Line 8: Vertical position offset

Line 9: Sensitivity in unit of 0.1mV (absolute value)

Line 10: Vertical sensitivity (Duplicate of line 5)

Line 11: Reference. This is the value corresponding to 0V level.

Sample data start from line 17 with each line being one sample.

From user point of view the most useful fields are those circled in Fig. 7. These fields give user information about the data. For example, by vertical display resolution and sensitivity absolute value (line 9) you know that the voltage resolution of data is 50mV. And the reference value in line 11 tells you where 0V is.

3. Use of Data

Once data are saved in PC it's up to you how to use them. Fig. 8 shows an example that rebuilt the waveform with Excel chart. This time you get a complete display of the whole data block.

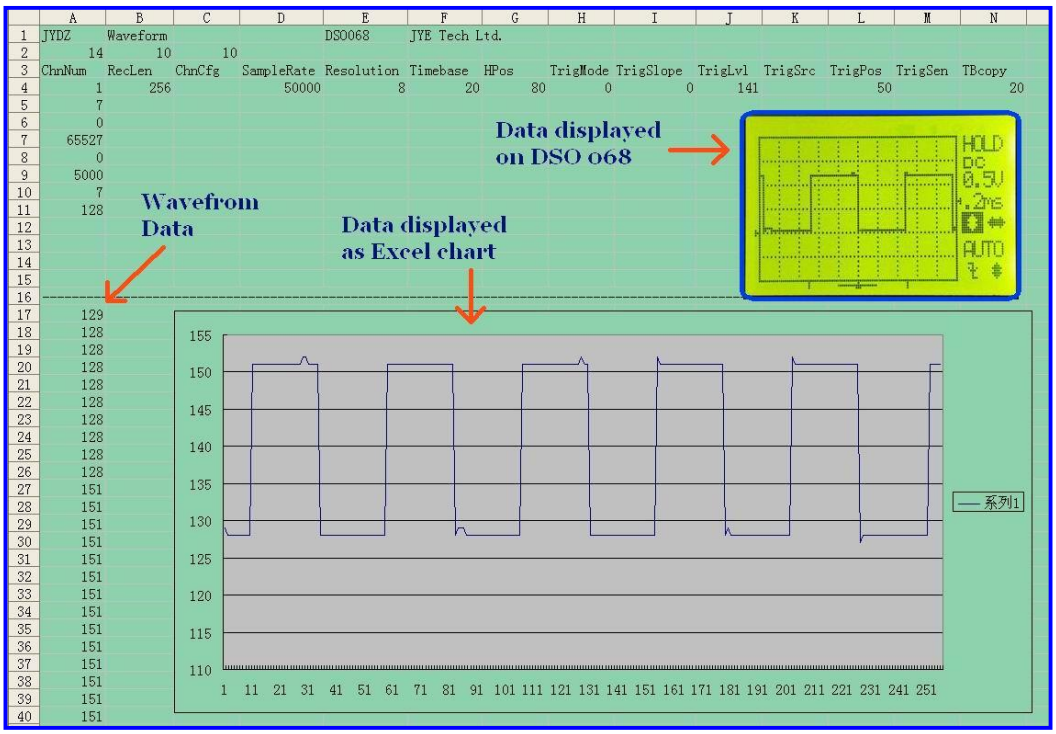
Data displayed
on DSO 068
Wavefrom
Data
Data displayed
as Excel chart
HOLD
DC
0.5V
.2ms
AUTO
系列1

Fig. 8