DSO138mini - How to Send Waveform to PC

Applicable firmware version 113-13810-110 or later

DSO138mini can send waveform data through its serial port to PC for storage or further analysis. This article describes the tools and steps required to perform the transfer. An example is given in details to show sending and displaying waveform on PC.

Connection

The serial port of DSO138mini locates at the bottom-right corner of the main board (Fig. 1). TX is output (transmitting). RX is input (receiving). The signal levels on this port are LVTTL. In order to connect the serial port to PC a converter is required. Fig. 2 below shows the connection diagram.

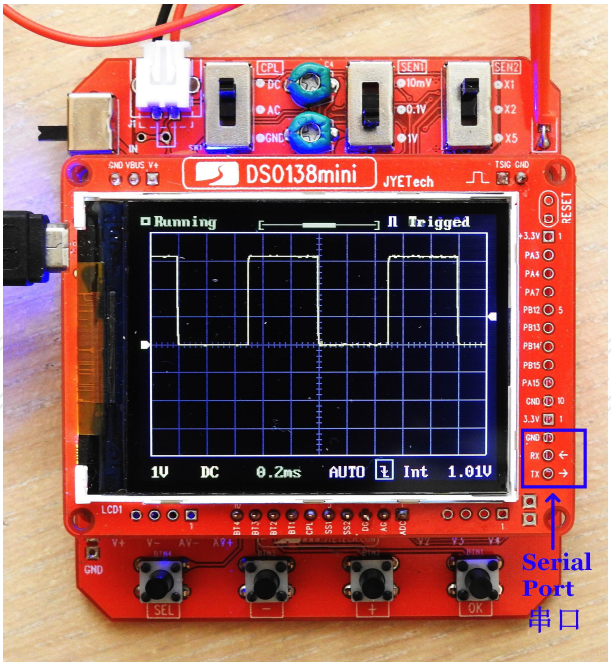


Fig. 1

Fig. 2

Commonly used converters are based on chips like CP2102, CH340, PL2303, etc. In order for a converter to work with PC the installation of specific driver for a chosen converter is usually required. After driver is properly installed a converter will appear as a traditional comport in PC when connected. For Windows this comport can be checked in the Equipment Manager.

Data Capture Application

You also need a comport application to capture the data sent by DSO138mini. There are a lot of such applications available on the web. Most of them can be used as long as they can receive and display ASCII coded texts. Please make sure the application you choose has big enough receiving buffer for a whole frame of data. Usually 50Kbyte size buffer is more than enough.

In order to correctly receive data the comport needs to be set to the correct parameters. This is usually done in comport application. The parameters used for the data transfer are 8 data bit, 1 stop bit, and no parity check. The baud rate is 115200 bps.

In the example below we use TeraTerm as comport application. It can be downloaded at

https://jyetech.com/wp-content/uploads/2018/07/tera-term.zip

Sending Waveform

Waveform transmitting is started by holding down SEL button for 2 seconds. The whole buffer data for the currently displayed waveform, the oscilloscope settings, and the signal measurements will be sent together (see format explained below). It is recommended to put the scope into HOLD state before performing the sending. This will make sure that the wanted waveform is transferred.

Data Format

Data are sent in plain ASCII coded text with one line for one parameter or one sample. Fig. 3 shows the first 24 lines of a transfer. Lines 1 – 9 are oscilloscope settings under which the waveform was captured. Lines 10 – 18 are measurements of the waveform. Line 19 is the time interval by which the samples were sampled. This interval is determined by timebase setting. Starting from line 20 are waveform data with one line for one sample. There are 1024 samples in total since the buffer size is 1024 points.

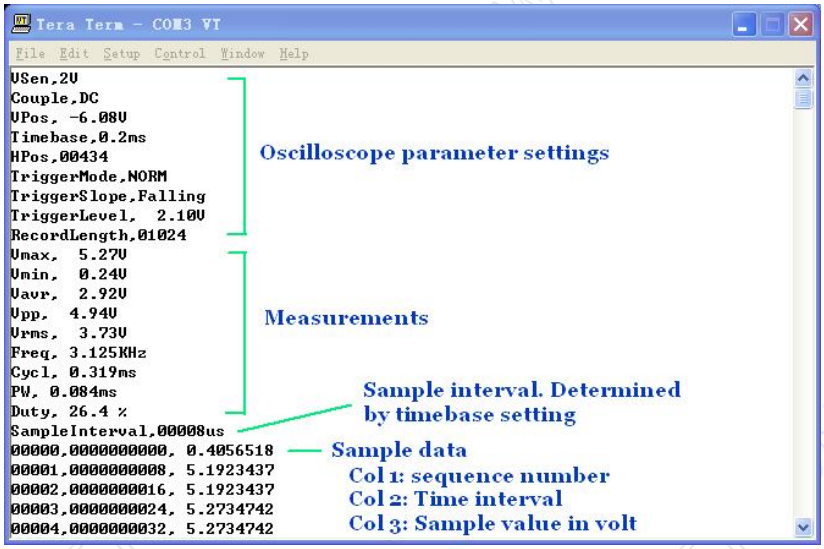


Fig. 3

In the sample data section column 1 is sample sequence number. Column 2 is the time mark when the corresponding sample is obtained. Column 3 is sample value in volt.

After all data in a transfer has been captured select and copy and paste the data to a text reader (like the Notepad in Windows) and then save it as a text file for storage and future analysis.

An Example

This example shows how to send waveform data from DSO138mini and display the waveform in Excel.

1) Make connection

Fig. 4 shows the connection between DSO138mini and USB. A 119 board (CP2102 converter) is used for Uart-USB conversion. (This board is available at www.accudiy.com/collections/development-tools/products/uart-usb-converter).

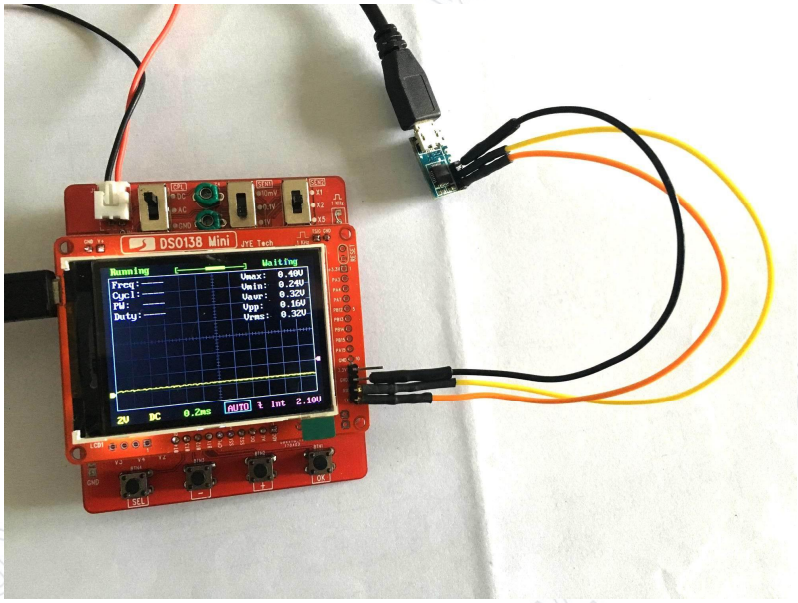


Fig. 4

2) Setup comport application

Start TeraTerm. Select connection type as Serial and select comport number. In our case the comport number is COM3 (Fig. 5).

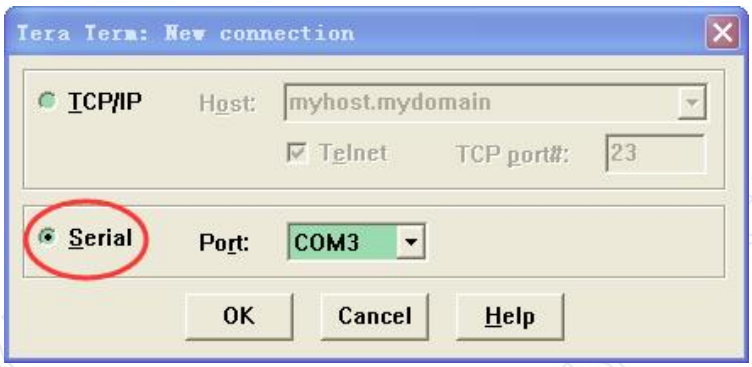


Fig. 5

Under menu "Setup" select "Serial port". Choose parameters as shown in Fig.6 and click OK. Again under menu "Setup" select "Window". Change Scroll Buffer lines to more than

1500 and then click OK (Fig. 7). Now TeraTerm is ready to receive data from the selected comport.

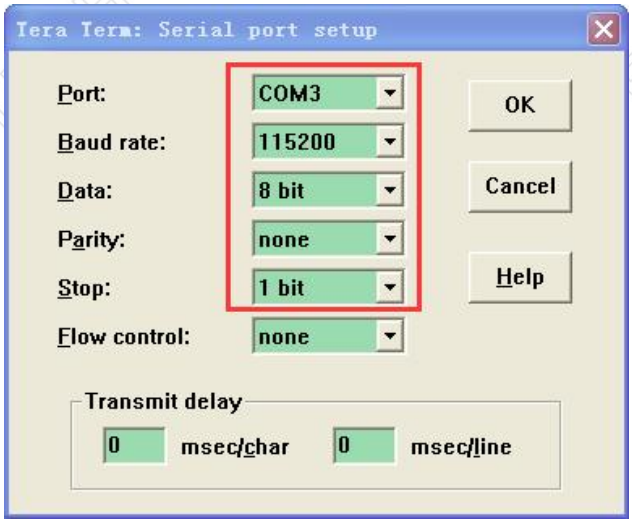


Fig. 6

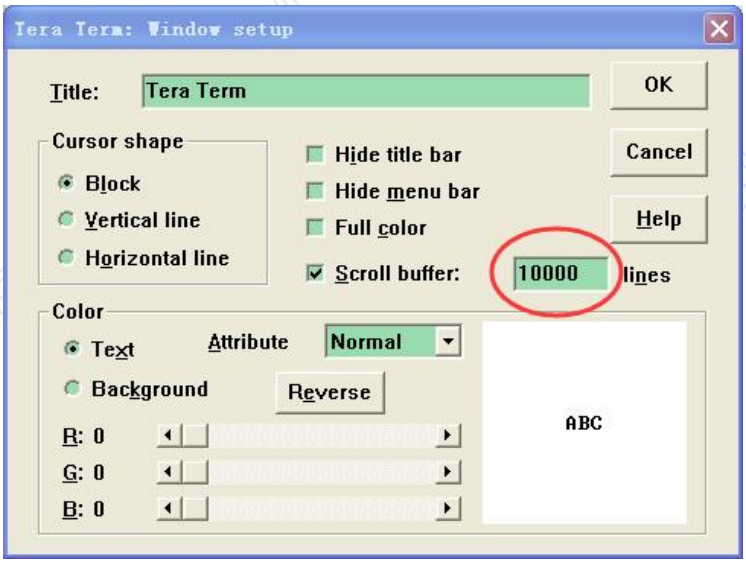


Fig. 7

3) Capture signal waveform

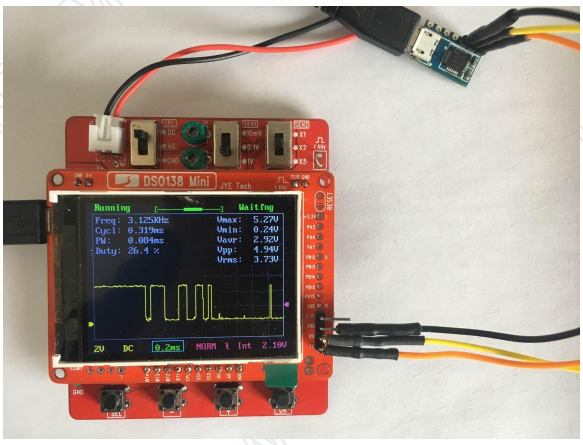


Fig. 8

Capture the waveform to be sent. Fig. 8 shows a waveform produced by a relay contact in action.

4) Send the waveform

Press and hold SEL button for about 2 seconds to initiate data sending. Fig. 9 shows the received data (after scrolled to top).

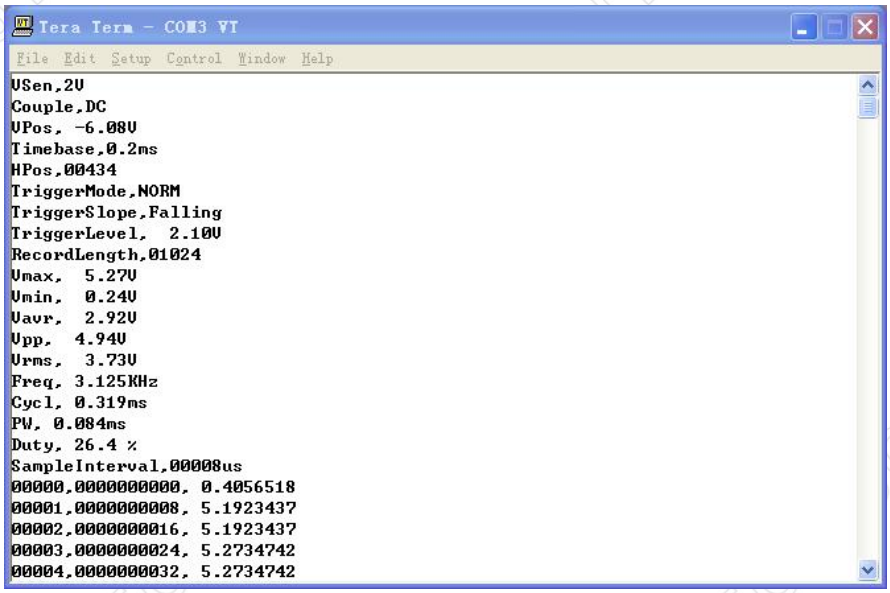


Fig. 9

5) Save data as csv file

Copy & paste all received data to a text reader. Save the texts to a file with csv as extension. In Fig.10 an old text editor Textpad was used for the job.

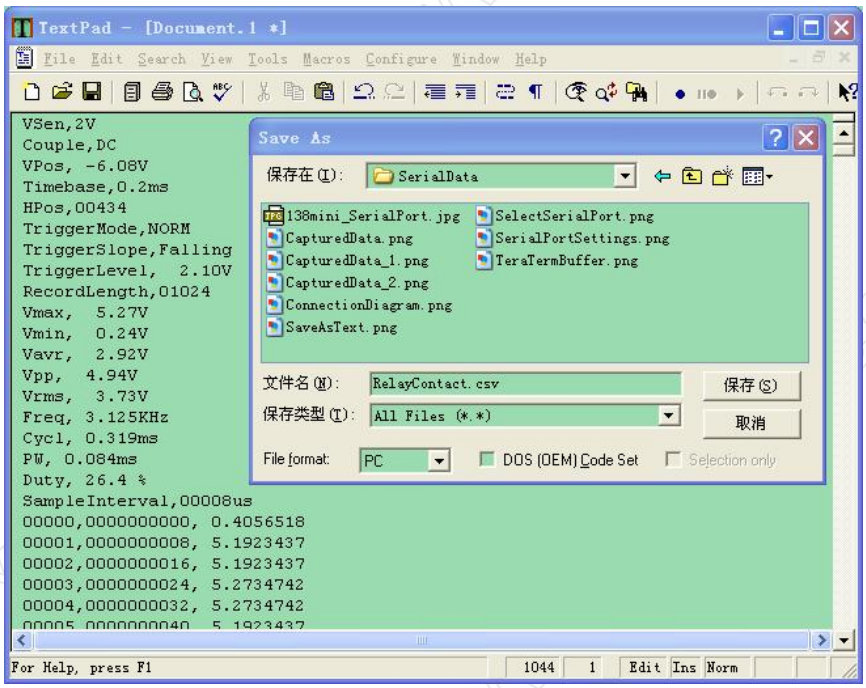


Fig. 10

6) Plot the data

a) Open the saved file in Excel. It would look like that in Fig.11.

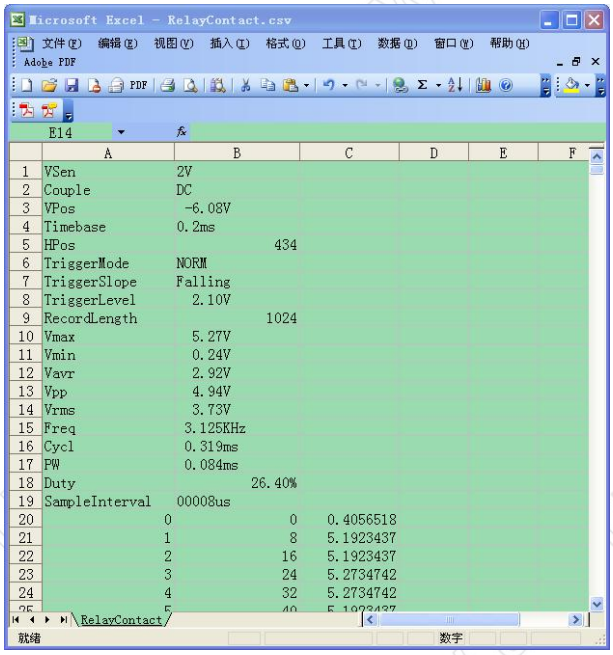
b) Delete the first 19 rows and the first 2 columns. You have all pure sample data left (Fig.12).

c) Click on chart icon and select chart type as shown in Fig.13.

d) Select the sample data as chart data source (Fig.14).

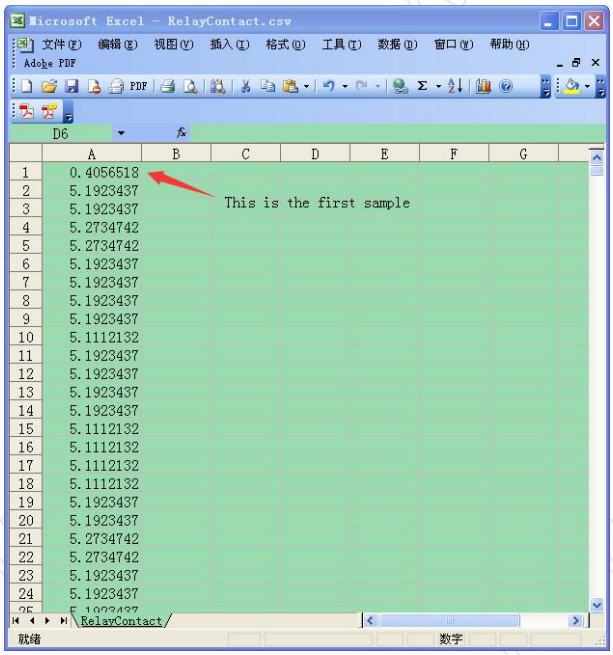
e) Add optional axis names (Fig.15).

f) Click Finish. You would get waveform plotted similar to that shown in Fig.16.



	A	B	C	D	E	F
1	VSen	2V				
2	Couple	DC				
3	VPos	-6.08V				
4	Timebase	0.2ms				
5	HPos		434			
6	TriggerMode	NORM				
7	TriggerSlope	Falling				
8	TriggerLevel	2.10V				
9	RecordLength		1024			
10	Vmax	5.27V				
11	Vmin	0.24V				
12	Vavr	2.92V				
13	Vpp	4.94V				
14	Vrms	3.73V				
15	Freq	3.125KHz				
16	Cycl	0.319ms				
17	PW	0.084ms				
18	Duty		26.40%			
19	SampleInterval	00008us				
20		0	0	0.4056518		
21		1	8	5.1923437		
22		2	16	5.1923437		
23		3	24	5.2734742		
24		4	32	5.2734742		

Fig. 11



	A
1	0.4056518
2	5.1923437
3	5.1923437
4	5.2734742
5	5.2734742
6	5.1923437
7	5.1923437
8	5.1923437
9	5.1923437
10	5.1112132
11	5.1923437
12	5.1923437
13	5.1923437
14	5.1923437
15	5.1112132
16	5.1112132
17	5.1112132
18	5.1112132
19	5.1923437
20	5.1923437
21	5.2734742
22	5.2734742
23	5.1923437
24	5.1923437

Fig. 12

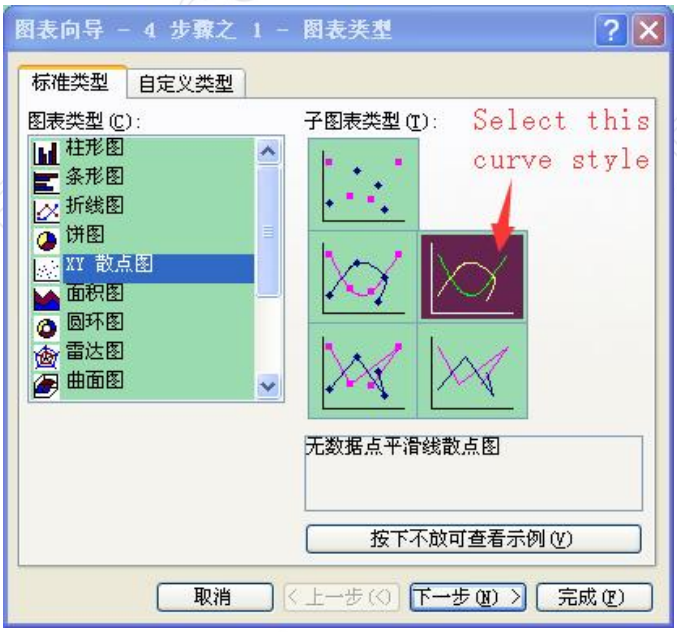

图表向导 – 4 步骤之 1 – 图表类型
标准类型
自定义类型
图表类型(C):
柱形图
条形图
折线图
饼图
XY 散点图
面积图
圆环图
雷达图
曲面图
子图表类型(T):
Select this curve style
无数据点平滑线散点图
按下不放可查看示例(V)
取消
< 上一步(B)
下一步(N) >
完成(F)

Fig. 13

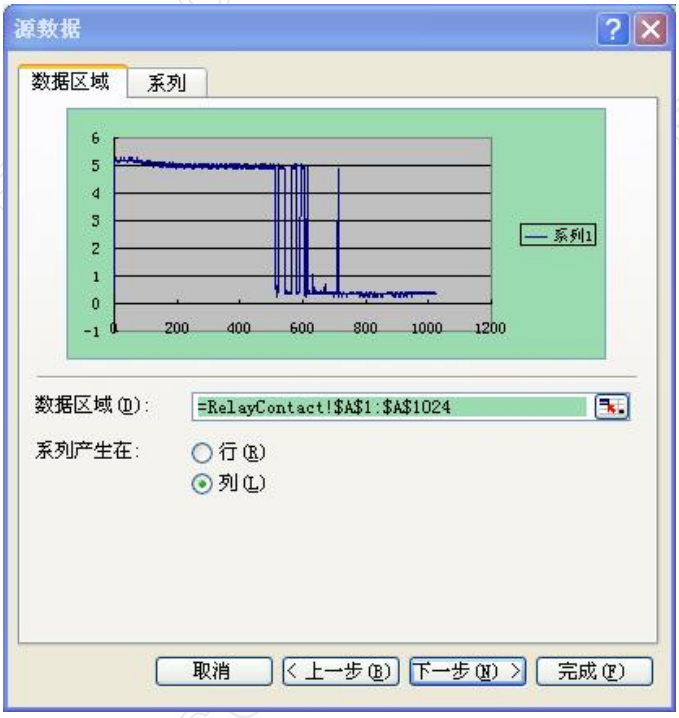

源数据
数据区域
系列
6
5
4
3
2
1
0
-1
0
200
400
600
800
1000
1200
系列1
数据区域(D):
=RelayContact!$A$1:$A$1024
系列产生在:
行(R)
列(L)
取消
< 上一步(B)
下一步(N) >
完成(F)

Fig. 14

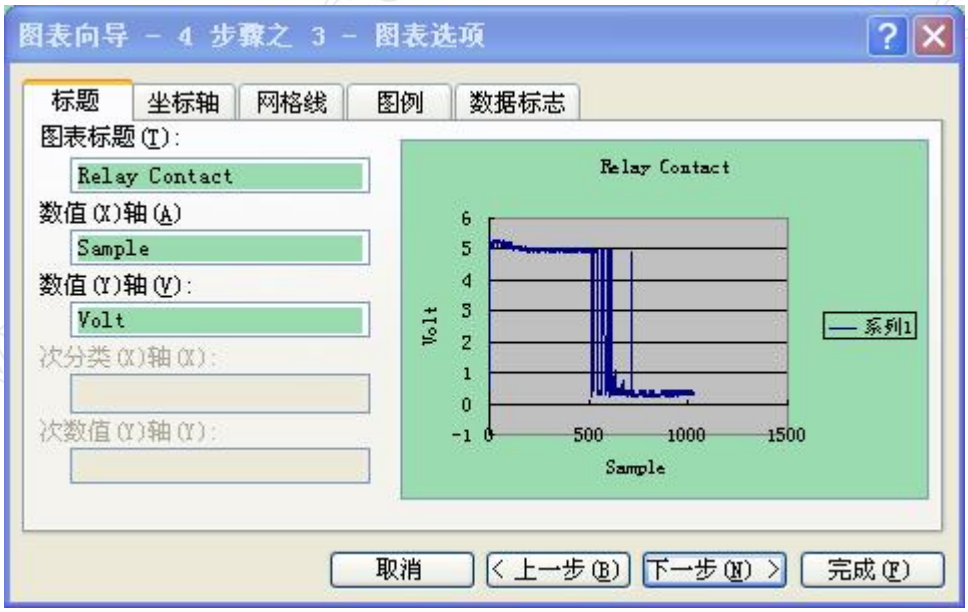

图表向导 – 4 步骤之 3 – 图表选项
标题
坐标轴
网格线
图例
数据标志
图表标题(T):
Relay Contact
数值(X)轴(A)
Sample
数值(Y)轴(V):
Volt
次分类(X)轴(X):
次数值(Y)轴(Y):
Relay Contact
Volt
Sample
系列1
取消
< 上一步(B)
下一步(N) >
完成(F)

Fig. 15

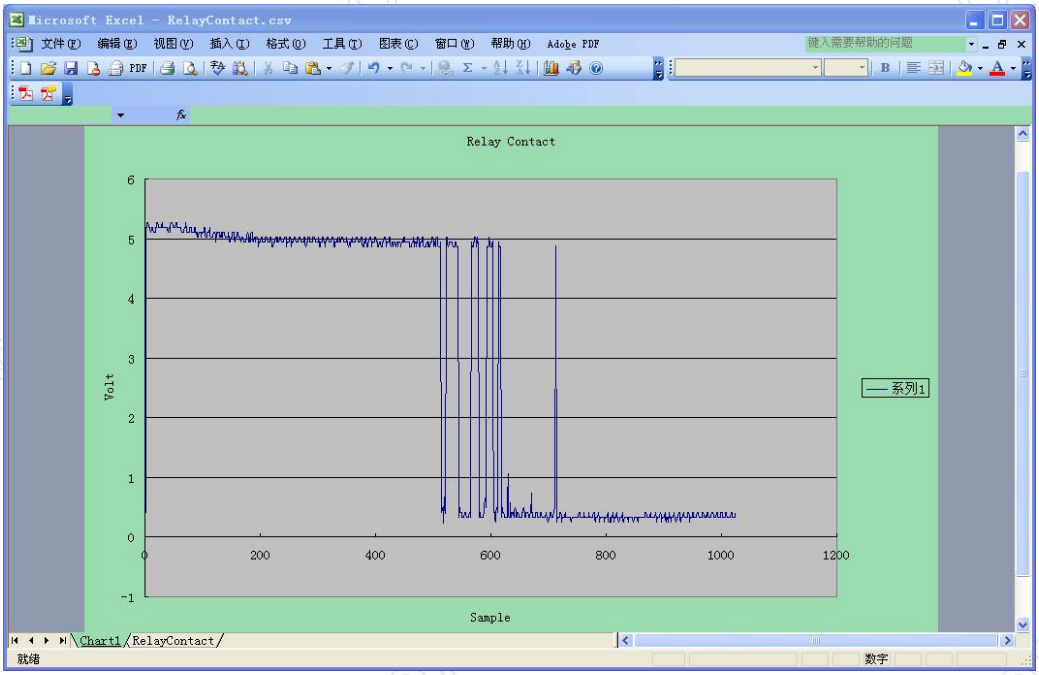

Microsoft Excel - RelayContact.csv
Relay Contact
Volt
Sample
系列1
Chart1
RelayContact
就绪
数字

Fig. 16