

## Piezo Controller Software User Manual

Version: V1.0



The user manual describes the following products:

- E70 series
- E53.C series
- E53.D series
- E01.C series
- E01.D series
- E00.C series
- E00.D series

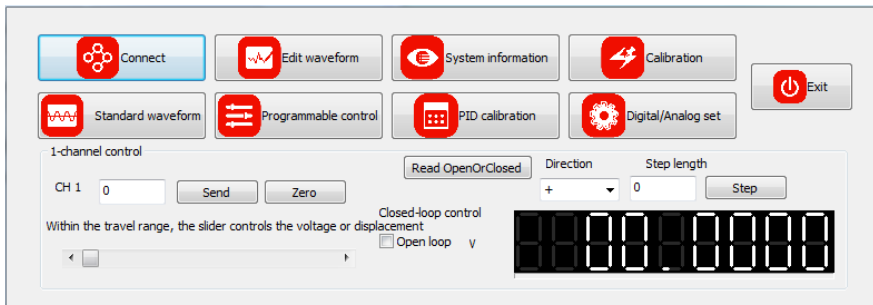
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# 1.Introduction

Introduction is based on 1 channel, similar to Multi-channel.

## 1.1 Home Screen

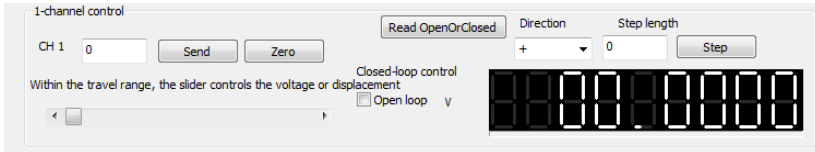


**CH1 home screen:** single point sending, zero setting, slider control, open/closed loop switch, voltage/displacement automatic display of piezo controller.

**Function optional:** connect, edit waveform, system information, calibration, standard waveform, programmable control, PID calibration, digital/analog set and exit system.

**Single point sending:** Fill sending data, click"Send" button. For closed loop control, click"Open loop", piezo controller turn onto closed loop, unchick "Open loop", the controller is open loop( E18 series switch open/closed loop through dip switch on the controller). For other model piezo controller(E18/E53/E70), all channels correspond to each other.

## 1.2 One Channel Control

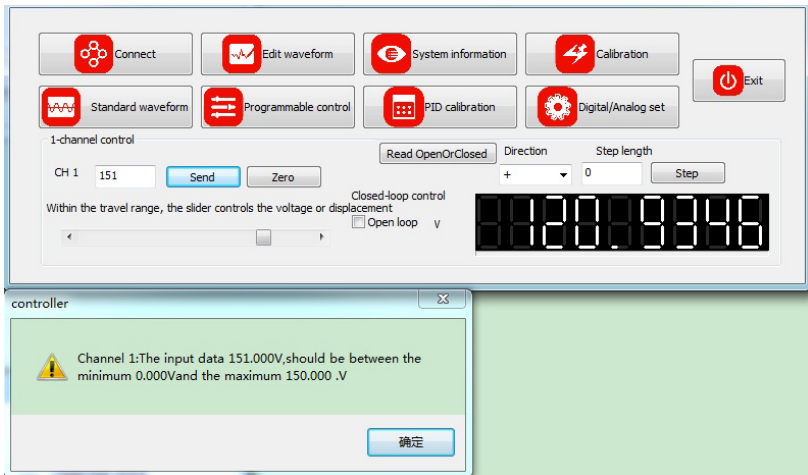


**Zero:** set zero, send "0" to piezo controller and also slider control to "0".


**Direction:** "+" means current position plus step data and "-" current position minus step data.

**Step:** The relative position of "+" and "-" to control the displacement.

There is edge detection when in single pointing send and step control, if output exceeds the range, it will not output and appear prompt.



### 1.3 Data Collection

Piezo controller output/display on software: CH1 data is for voltage/closed loop displacement, appr. once a second, 

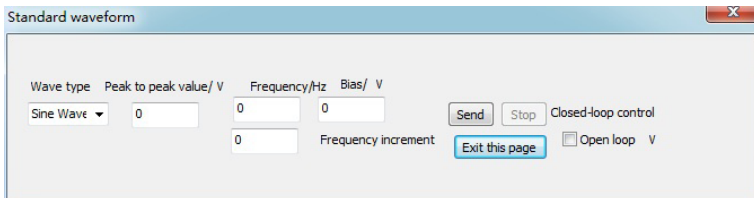
CH1 unit: open loop.....V

closed loop.....calibrate unit data, e.g. "(second of arc).

## 2. Standard Waveform

### 2.1 One Channel Waveform

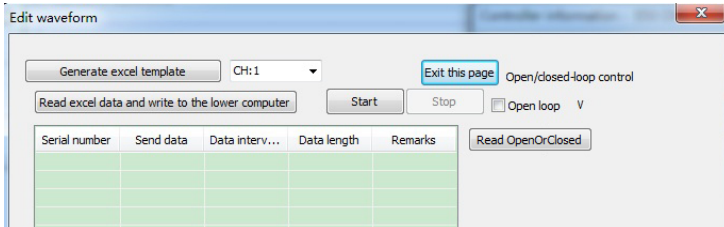
CH1 standard waveform: click "standard waveform".



Fill "Peak-to-peak value", "Frequency", "Bias" and "Wave type(sine wave, square wave, sawtooth, triangle wave, noise waveform to be added)", click "Send", and the software will send the waveform data according to open/closed loop to piezo controller. The piezo controller send the waveform, at the same time, "Send" button becomes dark and "Stop" button lights up. Send the waveform, and the data acquisition function is stopped. It will resumed after stopping to send waveform, stopping to sending edit waveform, sending programmable control completed, sending single point, zero clearing, slider control or step point prompting stop waveform sending( including standard and edit waveform).

## 3.Edit Waveform

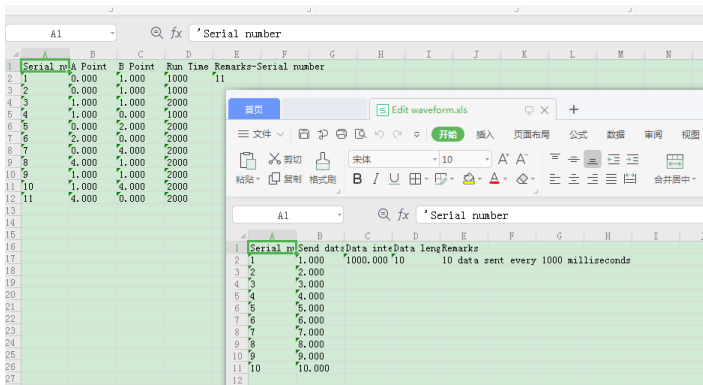
Edit waveform: Import the pre-set excel to realize the storage of the waveform, the time setting of point and point (between 1ms and 500ms, please note the software is not limited), and control the start and stop of edit waveforms through "Start" and "Stop" buttons.



### 3.1 Generate Excel Template

Click "Generate excel template", select the corresponding folder to generate a file named "Edit Wave.xls".

#### 3.1.1 Generate data



**Note!** Please be sure that the data can be completely converted into numbers, or use character types, pay special attention to the uniform format. Otherwise, the table data is invalid.

The data in the table could be changed. The send data is 1.000 when the piezo controller is open-loop data value, that means 1V voltage. If it is closed-loop, that means 1 $\mu$ m or 1mrad which is determined by the units in the table. That is to say, if the piezo controller switch open or closed loop state which it does not conform to the expected unit of stored data value, it need to change the excel data and import it to the piezo controller again, so that it can be output correctly.

### 3.1.2 Principle of editing data

Principle: Data "1" will be converted to the data value between 0 and 65535 which send by DA according to the open and closed loop state.

0~120V open-loop voltage is the same as the DA value from 0 to 120 $\mu$ m, but if closed-loop stroke is 0 to 10 $\mu$ m, the data value sent by DA corresponding to data "1" is completely different. This is the reason why it is necessary to reimport the excel data corresponding to the open or closed loop state of piezo controller.

Sending open loop data changed range: between minimum voltage and maximum voltage, and within travel range for closed loop.

Data interval is an integer of greater than 1 and less than 5000 in milliseconds.

Data length indicates sending data from 1 to 192 , if more than 192, it will be calculated according to 192.

The header name and relative position couldn't be changed, neither could the first sheet name of the table. The data must be a floating point number or integer greater than 0.

Serial number: This is used to record how much data is sent.

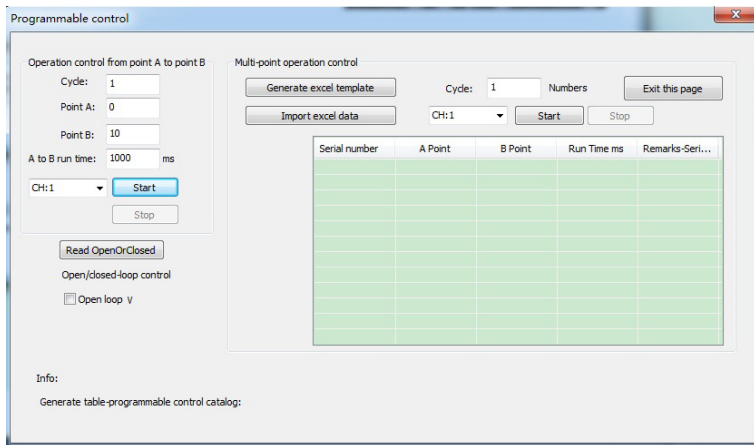
Edit waveform function: through Excel, it could import the data calculated by other programs, and store it to the piezo controller for quick and convenient output.

## 4. Programmable Control

### 4.1 Generate Template

Operational control from A to B, setting the coordinates of A and B, then run time from A to B which compose run track of A to B, run time of serial port and USB by sending points data.

Edit data interval time: please be within 200 milliseconds to 5000 milliseconds.



CH1 indicates Channel 1. For multi-channel, it will display CH2, CH3.....CHx.

Read Open or closed, it will be consistent with the corresponding channel for multi-channel.

### 4.2 Multi-point Operational Control

Multi-point operational control represents the run time between two points by the import of multiple point-to-point data from excel, so that it could easily control the piezo stage operations.

Generate excel template to the corresponding folder.



## 4.3 Generate Data Excel

Generate the data excel as following:

Serial number	A Point	B Point	Run Time	Remarks-Serial number		
1	0.000	1.000	1000	11		
2	0.000	1.000	1000			
3	1.000	1.000	2000			
4	1.000	0.000	1000			
5	0.000	2.000	2000			
6	2.000	0.000	2000			
7	0.000	4.000	2000			
8	4.000	1.000	2000			
9	1.000	1.000	2000			
10	1.000	4.000	2000			
11	4.000	0.000	2000			

The data in the table can be changed.

Point A: 0.000 Point B: 1.000 Run time: 1000ms

It indicates the run time is 1000ms from point A to point B.

Execute in line order from top to bottom

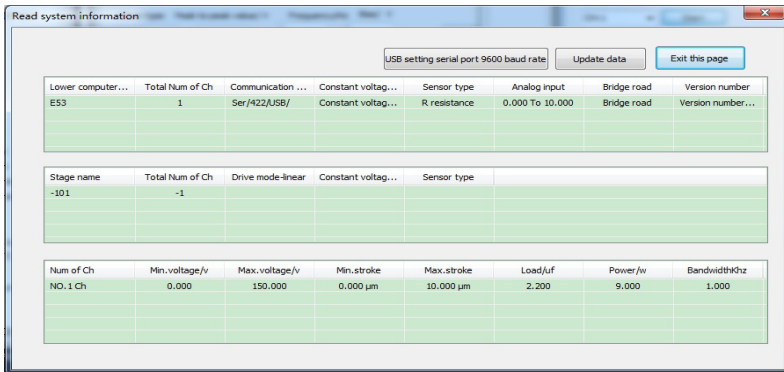
Remarks-Series No.: indicates how many two point executions are sent.

The header name and relative position couldn't be changed, neither could the first sheet name of the table.

The number of table should be complete. The input data should be in the voltage range in open loop state and need to be in the travel range in closed loop state. The excess data will not be displayed.

## 5. System Information

System information: display the basic information of the connected piezo controller and piezo stage.



The screenshot shows a software window titled "Read system information" with three data tables and control buttons. The control buttons include "USB setting serial port 9600 baud rate", "Update data", and "Exit this page".

Lower computer...	Total Num of Ch	Communication ...	Constant voltag...	Sensor type	Analog input	Bridge road	Version number
E53	1	Ser/422,USB/	Constant voltag...	R. resistance	0.000 To 10.000	Bridge road	Version number...

Stage name	Total Num of Ch	Drive mode-linear	Constant voltag...	Sensor type
-101	-1			

Num of Ch	Min. voltage/v	Max. voltage/v	Min. stroke	Max. stroke	Load/uf	Power /w	BandwidthKHz
NO.1 Ch	0.000	150.000	0.000 $\mu$ m	10.000 $\mu$ m	2.200	9.000	1.000

USB setting serial port 9600 baud rate means that in USB communication state, set serial port baud rate to 9600. It is used if the piezo controller does not know baud rate or set it to 23400, it will reset it to 9600 and restore to serial communication to 9600 baud rate.

Update data means to update the data on this page after piezo controller calibration.

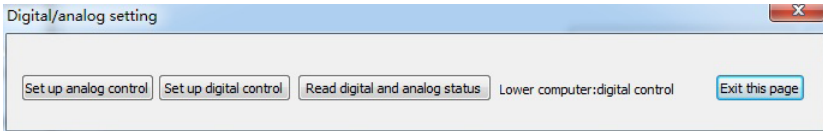
## 6. Calibration

It is used for calibration or piezo controller upgrade supporting, and the password is required to set it up.

If the setting is improper, it will cause unnecessary errors and losses. It could only be used with the support of manufacturer.

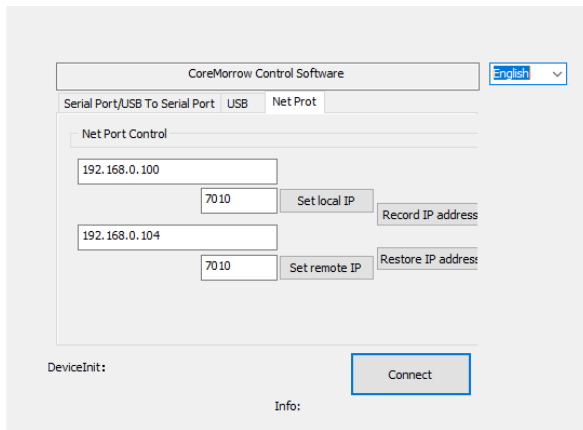
## 7. Digital/Analog Set

Switch the control state of the piezo controller.



## 8. Connect

Connect controller: Serial port /USB port/Net port.



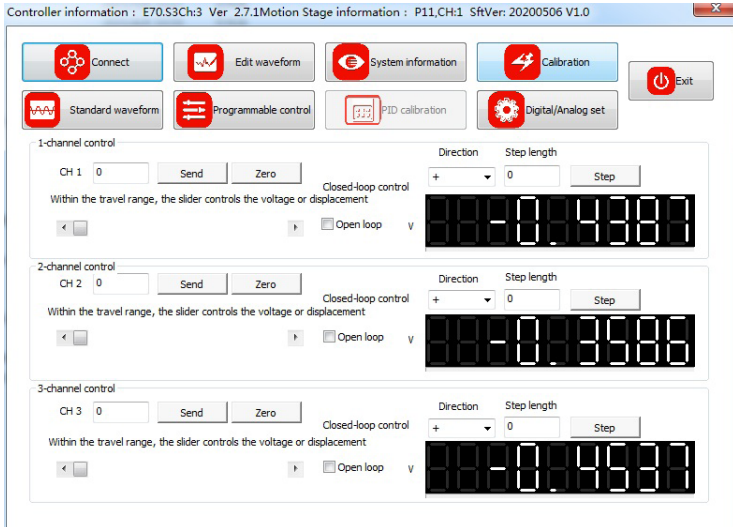
Serial port/USB port/Net port: according to the actual situation, connect COM port, Win7->Device manager->COM.

Baud rate: Set the baud rate of the piezo controller to 9600. Similarly, you can select 115200 baud rate to control the piezo controller. Please maintain the last serial baur rate. If the piezo controller is turned off.

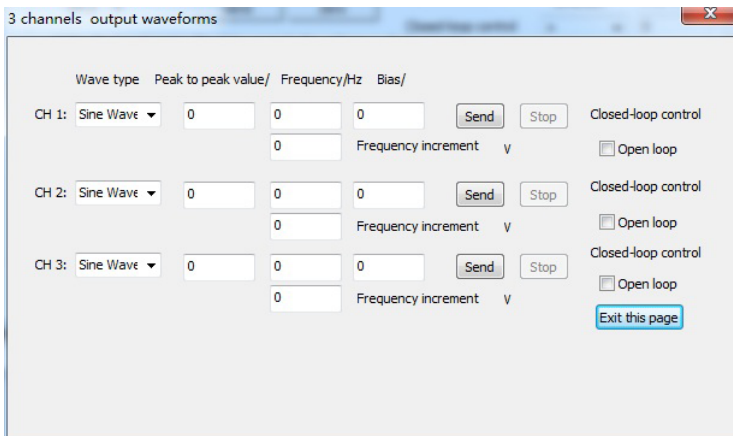
Click"Connect", connection is successful.

## 9. Interface Display

3 channels home screen:

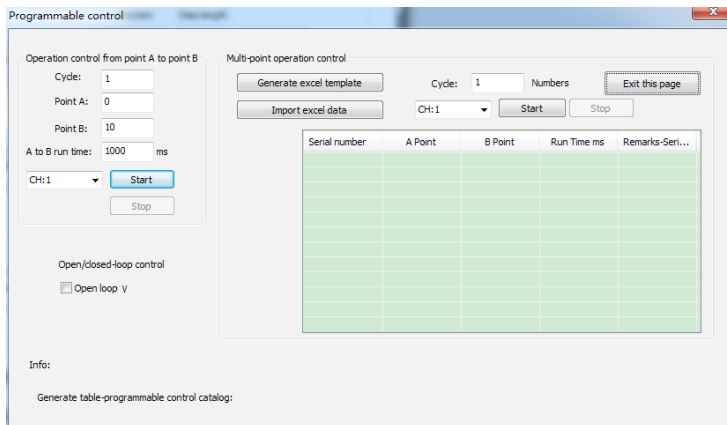


3 channels output waveform screen:





3 channels programmable control screen:



## 10. Contact us

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