

Modular E70 Series Piezo Controller

User Manual

Version: V1.0



This document describes the following products:

- Modular E70 Servo controller SGS sensor

DECLARATION

Declaration!

This user manual is a integrated user manual of the Modular E70 series piezoelectric controller. Please read this user manual carefully before using this controller. Follow the instructions in the manual during use. If there is any problem, please contact us for technical support. If you do not follow this manual or disassemble and modify the product yourself, the company will not be liable for any consequences arising therefrom.

Please read the following to avoid personal injury and to prevent damage to this product or any other product connected to it. In order to avoid possible hazards, this product can only be used within the specified range.

Notice!

Do not touch any exposed ends of the product and its accessories.

There is high voltage inside. Do not open the case without permission.

Do not connect or disconnect input, output, or sensor cables with power on.

Please keep surface of Modular E70 clean and dry, don't operate in humid or static environment.

After use, output voltage should be cleared to zero before turning off the controller switch, such as switching the servo state to the open-loop state.

Danger!

The piezoelectric power amplifier described in this manual is a high-voltage device capable of outputting high currents, which can cause serious or even fatal damage if not used properly.

It is strongly recommended that you do not touch any parts that connect to the high voltage output.

Special Note: If you connect it with other products in addition to our company, please follow the general accident prevention procedures.

Operating the high-voltage amplification requires training professional operators.

Warning!

If the voltage exceeds the PZT's tolerable range, it will cause permanent damage to the PZT. Before adding voltage to the PZT poles, it must be ensured that the positive and negative poles of the PZT are connected correctly and the operating voltage is within the allowable range of this PZT.

Cautious!

Modular E70 housing should be installed on a horizontal surface in an area with a 3CM air flow area to prevent internal convection in the vertical direction.

Insufficient airflow can cause equipment to overheat or premature instrument damage.

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1.Security

1.1 Introduction

- ▶ Please keep surface of Modular E70 clean and dry.
- ▶ Do't operate in humid or static environment.
- ▶ Modular E70 is used to drive capacitive loads (such as piezo ceramic actuators).
- ▶ Modular E70 cannot be used in user manuals of other products with the same name.
- ▶ Pay attention to Modular E70 cannot be used to drive inductive loads.
- ▶ Modular E70 can be used for static and dynamic operating applications.
- ▶ Modular E70 with SGS sensor can use closed loop operation mode.

1.2 Safety Instructions

Modular E70 is based on nationally recognized safety standards. Improper use may cause personal injury or damage Modular E70. Operator is responsible for correct installation and operation of it.

- ▶ Please read the user manual in detail.
- ▶ Please immediately eliminate any malfunctions and safety hazards caused by malfunctions.

If the protective grounding wire is not connected or connected incorrectly, there will be possibility of electric leakage. If you touch Modular E70 piezo controller, it can cause serious or even fatal injuries.

If open Modular E70 privately, touching live parts may cause electric shock, resulting in serious or even fatal injury or damage to the Modular E70 series controller.

- ▶ Only authorized professional could open the Modular E70 series controller.
- ▶ When opening Modular E70 series controller, please disconnect the power plug.
- ▶ Please do not touch any internal parts when operating in an exposed state.

1.3 User Manual Notes

▶ The contents described in user manual are standard product descriptions, special product parameters are not described in detail in this manual.

- ▶ The latest user manual is available for download on the company website.
- ▶ When using Modular E70 series piezo controller, the user manual should be placed near the system for easy reference in time. If the user manual is lost or damaged, please contact our customer service department.
- ▶ Please timely add all the information given in the manufacturer's user manual, such as supplements or technical descriptions.
- ▶ If your user manual is incomplete, it will miss a lot of important information, cause serious or fatal injuries, and cause property damage. You have read and understood the contents of the user manual before installing and operating the Modular E70 series piezo controller.
- ▶ Only authorized professionals who meet the technical requirements can install, operate, maintain and clean the Modular E70 series of digital piezo controllers.

2.Features and Applications

Modular E70 can freely choose the number of cascaded modules according to the user's needs. The number of channels for a single module is 3 channels/module, and up to 32 modules can be cascaded. It can be controlled by external analog signals or digital signals via RS-422 interface and optional servo control function.

2.1 Series

Model	Description
Modular E70	Piezo controller, 6/9/12/.../96 channel optional, SGS sensor, Software control and analog input control

2.2 Appearance

2.2.1 Front Panel



Symbol	Function	Description
Power	LED green	Power indicator is always on, Modular E70 is in working condition.
PZT&Sensor	LEMO-ECG-2B-312	Output voltage to drive piezo actuator(PZT) . Sensor input signal
Analog In	SMB	Set DIP switch/software to select control mode. Analog input is used as the target value of the input voltage. The input voltage can be an analog signal generated by computer(such as DA card). You can use signal generator, analog signal source to connect.
Sensor Monitor	LEMO-EPG.0B-304	Sensor output signal monitoring terminal. Output range is 0 to 10V
ZERO	Potentiometer	Changing mechanical load or temperature changes will cause deviation of sensor zero. No operating is required after zero adjustment.(If closed-loop state works normally, the zero point potential does not need to be adjusted.)
Target	LED yellow	When signal is not within range of target position, the target detection abnormal indicator lights up.(TTL, active low).
Limit	LED red	When output current of channel exceeds set value, the corresponding over-current indicator lights up.

2.2.2 Rear Pane



Symbol	Function	Description
RS422	D-SUB 9	Connect the computer with the controller interface module through RS-422 port access terminal to realize computer control
Power supply	DC-022B(ø2.5)	Power connector socket. Connect via power adapter or DC power supply.
Switch	KCD1-102	Control the power on and off of the piezo controller.



3. Checking

Modular E70 controller has been carefully checked for electrical and mechanical aspects before shipment. When you receive the device, unpack and inspect the surface of the system for any obvious signs of damage. If it is damaged, it may be damaged during transportation, please contact our customer service department in time. Check whether the accessories are complete according to the packing list. Please keep the original packaging materials for subsequent maintenance and using.



4. Installment

4.1 Installation Precautions

Note! Improper installation of modular E70 series piezo controller may cause personal injury or damage modular E70 series piezo controller!

- ▶ Installation and using of modular E70 should be close to the power source, so that the power plug can be easily and quickly disconnected from the main power source.
- ▶ Use included power cord to connect modular E70 series piezo controller system.
- ▶ If power cord provided by our company must be replaced, please use power cord with large enough size and effective grounding.

4.2 Ensure ventilation

Note! Overheating of equipment due to high temperature may damage modular E70!

- ▶ Ensure that the cooling area of the controller is sufficiently cooled.
- ▶ Ensure that there is adequate ventilation equipment.
- ▶ Keep ambient temperature to non-critical level(<50°C).
- ▶ Temperature of cooling surface of controller>50 °C , it is recommended to take external heat dissipation measures to improve the stability of the controller.

4.3 Connect power

Use power adapter (output range +20V~+30V/3A) to connect to power supply interface of modular E70 power supply.

4.4 Cable connection

- ▶ When the power supply is disconnected, connect the PZT&Sensor cable to modular E70 interface. Note that the number on the piezo actuator corresponds to the number of the controller.
- ▶ Analog control mode, when the signal source (signal generator, analog signal source, DA control card) output is 0, connect the SMB cable to the SMB interface of modular E70 controller.
- ▶ Connect to the computer control mode of PC, connect to PC through the cable connection USB interface or RS-232/422 interface socket.

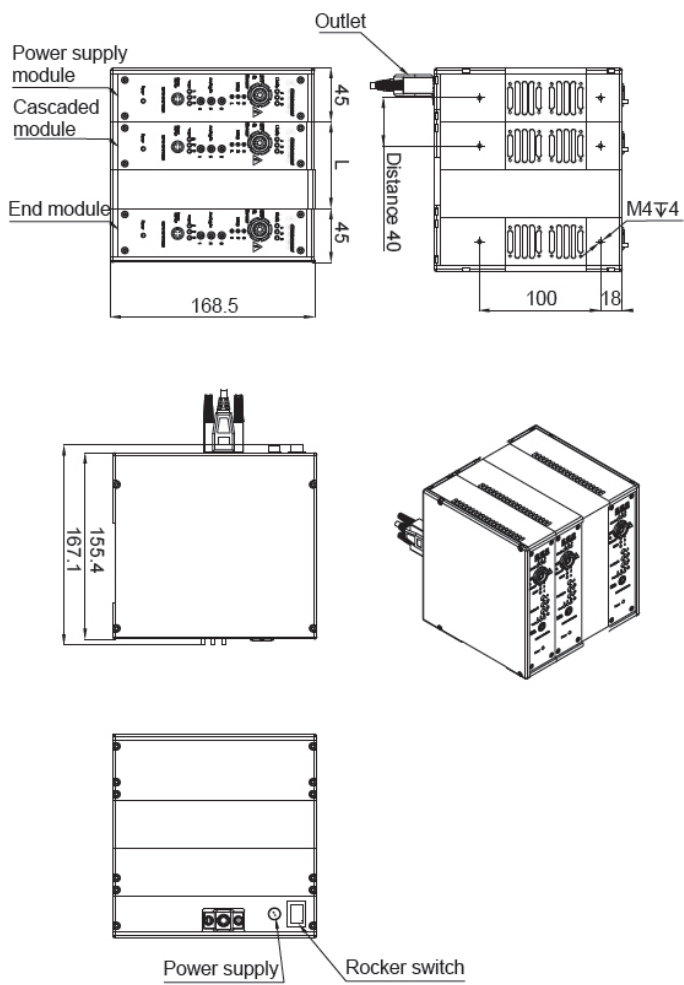
5.Parameter

5.1 Environmental Conditions

The using environment of modular E70 series controller:

Environmental conditions	Condition description
Application	For room use only
Environment humidity	30%~70%
Operating temperature	0° C—+50° C
Storage temperature	-10° —+85° C

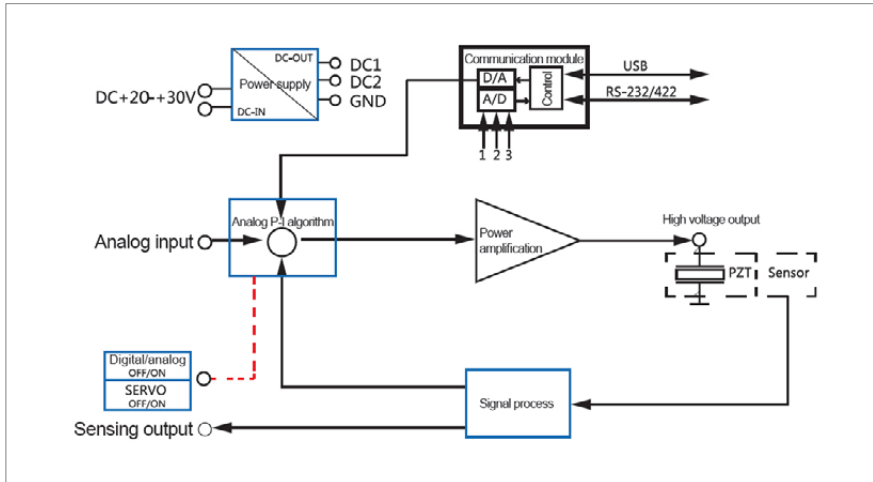
5.2 Drawings



Type	E70.D6S	E70.D9S	E70.D12S	...	E70.D96S
L(mm)	0	40	80	...	1280

Note: When two modules are cascaded, the total width is 90mm, and each increase for a module, the total width increases by 40mm, and so on.

5.3 Driving Principle



6. Power Calculation

- Average output (Sine wave operation mode)

$$P_a \approx U_{pp} \cdot U_s \cdot f \cdot C_{piezo}$$

P_a =Average output[W]

C_{piezo} =Piezo actuator capacitance[F]

U_{pp} =Peak and peak drive voltage [V]

f =Operating frequency of the sine wave[Hz]

U_s =Drive voltage[V] ($(V_{s+}) - (V_{s-})$)



7. Maintenance, Storage, Transportation >>

7.1 Cleaning measures

Note! The PCB board of the function module in the modular E70 system is an ESD (electrostatic discharge) sensitive device. Take precautions against any static build-up of these devices before use to avoid contact with circuit component leads and PCB wiring. Before touching any electronic components, the body first touches the grounding conductor to discharge static electricity, ensuring that any type of conductive particles (metal, dust or debris, pencil lead, screws) enter the device. Be careful not to drop the equipment when cleaning, to avoid any form of mechanical shock!

- ▶ Disconnect the power plug of modular E70 system before cleaning.
- ▶ Prevent cleaning fluid and any liquid from entering the system module to avoid short circuits.
- ▶ The surface of the system chassis and the front panel of the module, please do not use an organic solvent for surface wiping.

7.2 Transportation and Storage

▶ This product is packed in carton. Transportation must be carried out under product packaging conditions, and direct rain and snow, direct contact with corrosive gases and strong vibrations should be avoided during transportation.

▶ The instrument can be transported under various conditions of normal transportation, and should avoid damp, load, collision, extrusion, irregular placement and other adverse conditions during transportation.

▶ If the instrument is not used for a long time, the instrument should be packaged and stored.

▶ The instrument should be stored in a non-corrosive atmosphere and in a well ventilated, clean room.

▶ In the process of transportation, storage and use, attention should be paid to fire prevention, shockproof, waterproof and moisture proof.

8. Service and Maintenance

8.1 Disposal

▶ When disposing of old equipment, please abide by the national regulations and local regulations. Please dispose of the old equipment properly. Please contact CoreMorrow for the upgrade and replacement of old equipment in order to meet the customer's handling of system products.

▶ If you have an old device or an unusable device that cannot be handled, you can ship it to the following address: However, the shipping costs will be borne by the sender. We do not accept freight collect shipments.

Address: 1F, Building I2, No.191 Xuefu Road, Nangang District, Harbin, Heilongjiang

8.2 After-sales Service

- ▶ Modular E70 does not contain user repairable components.
- ▶ Modular E70 must be returned to factory for any service and repair.
- ▶ Any part of modular E70 is dismantled, there will be no warranty service.
- ▶ Modular E70 is a precision instrument which should be handled with care.
- ▶ In case of any problem, please record the problem and contact CoreMorrow to be repaired by professional technicians.



9.Contact us

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CoreMorrow Official and CTO WeChat are below:

