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E-500 · E-501 Modular Piezo Controller

Flexible System for Piezo Actuators and Nanopositioners

Configuration example: E-500 Chassis with optional modules: E-505 piezo amplifier (3 x), E-509.S servo-controller for SGS sensors, E-517.i3 24-bit interface / display module

Configuration example: E-501 chassis with optional modules: E-503 piezo amplifier, E-509.C2A servo-controller for capacitive position sensors, E-517.i3 24-bit interface / display module

- **Up to 3 Axes, Custom Systems up to 12 Axes and More**
- **Choice of Amplifier Modules for Low-Voltage and High-Voltage, 14 to 400 W Peak Power**
- **Choice of Position Servo Control Modules for SGS & Capacitive Sensors, 1 to 3 Channels**
- **Choice of PC Interface / Display Modules**
- **19- & 9½-Inch Chassis**

The E-500 modular piezo controller system offers a broad choice of control modules for nanopositoning systems and actuators. This includes piezo amplifier and position servo controller modules for up to three channels with different features as well as display and interface modules. Flexible configuration makes the system adaptable to a wide range of applications.

30-channel controller consisting of 3 E-500.621 chassis, each of which can accomodate up to 12 E-621 modules

E-500 systems are assembled to order, tested, and, if a servo-controller is present, calibrated with the associated piezo mechanics.

Remote Control via Computer Interface

Installing the E-517, computer interface/display module (see p. 2-156) with 24-bit resolution makes possible control from a host PC.

Optionally, digital control via an external D/A converter is possible. For several D/A boards from National Instruments, PI offers a corresponding LabVIEW driver set which is compatible with the PI General Command Set (GCS), the command set used by all PI controllers. A further option includes the patented HyperBit™ technology providing enhanced system resolution.

Two chassis are available:

The E-500.00 19'' rackmount chassis provides operating voltages for all compatible modules including amplifiers, servo-controllers, display and interface modules (see system configuration see p. 2-144).

Ordering Information

E-500.00
19"-Chassis for Modular Piezo Controller System, 1 to 3 Channels

E-501.00
9½"-Chassis for Modular Piezo Controller System, 1 to 3 Channels

E-500.ACD
LabVIEW Driver Set for Analog Controllers

E-500.HCD
HyperBit™ Functionality for Enhanced System Resolution (Supports Certain D/A Boards)

Ask about custom designs!

Technical Data

Model	E-500.00	E-501.00
Function	19"-Chassis for Piezo Controller System: Amplifier Modules, Sensor- / Servo-Control Modules, Interface / Display Modules	9.5"-Chassis for Piezo Controller System: Amplifier Modules, Sensor- / Servo-Control Modules, Interface / Display Modules
Channels	1, 2, 3 (up to 3 amplifier modules)	1, 3 (1 amplifier module)
Dimensions	450 x 132 x 296 mm + handles	236 x 132 x 296 mm + handles
Operating voltage	90–264 VAC, 50–60 Hz	90–120 / 220–264 VAC, 50–60 Hz
Max. power consumption	180 W	80 W

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E-500 · E-501 Modular Piezo Controller

Module Survey & Ordering Information

A more compact 9½-inch version of the system is available as the E-501.00. It can hold one amplifier module (1- or 3-channel units available), one servo-control module (1- or 3-channel) and one display / interface module (1- or 3-channel).

A modified E-500 chassis for more channels is available on request. For systems with up to 12 channels, the E-500.621 chassis with E-621 amplifier / controller modules can be used (see p. 2-160).

The following modules can be installed in an E-500 / E-501 chassis:

Amplifier modules

E-503.00

Piezo Amplifier Module, -20 to 120 V, 3 Channels

E-504.00F

High-Power-Piezo Amplifier Module, 1 Channel, 280 W Peak Power, 100 W Average Power, -30 to 135 V

E-505.00

Piezo Amplifier Module, 200 W, -20 to 120 V, 1 Channel

E-508.00

HVPZT-Piezo Amplifier Module, +3 to +1100 V, 1 Channel

Sensor and Servo-Control Modules

E-509.C1A

Sensor / Piezo Servo-Control Module, Capacitive Sensor, 1 Channel

E-509.C2A

Sensor / Piezo Servo-Control Module, Capacitive Sensors, 2 Channels

E-509.C3A

Sensor / Piezo Servo-Control Module, Capacitive Sensors, 3 Channels

E-509.S1

Sensor / Piezo Servo-Control Module, SGS Sensor, 1 Channel

E-509.S3

Sensor / Piezo Servo-Control Module, SGS-Sensors, 3 Channels

E-509.E3 (see p. 3-12)

PISeca™ Sensor / Piezo Servo-Control Module for Single-Electrode Capacitive Sensor Probes, 3 Channels

E-509.E03 (see p. 3-12)

PISeca™ Modular Signal Conditioner Electronics for Single Electrode Capacitive Sensors, 3 Channels

Module for Servo-Control for External Piezo Amplifier

E-515.E3

In- / Output Module for Servo Control with External Piezo Amplifier, 3 Channels
Note: this module can only be used together with an E-509 servo controller module and is installed in the amplifier slot

Interface / Display Modules

E-517.i1

Interface / Display Module, 24-Bit D/A, TCP / IP, USB, RS-232, 1 Channel

E-517.i3

Interface / Display Module, 24-Bit D/A, TCP / IP, USB, RS-232, 3 Channels

E-515.01

Display Module for Piezo Voltage and Displacement, 1 Channel

E-515.03

Display Module for Piezo Voltage and Displacement, 3 Channels

E-508, p. 2-150

E-505, p. 2-147

E-503, p. 2-146

E-515, p. 2-154

E-517, p. 2-156

E-509, p. 2-152

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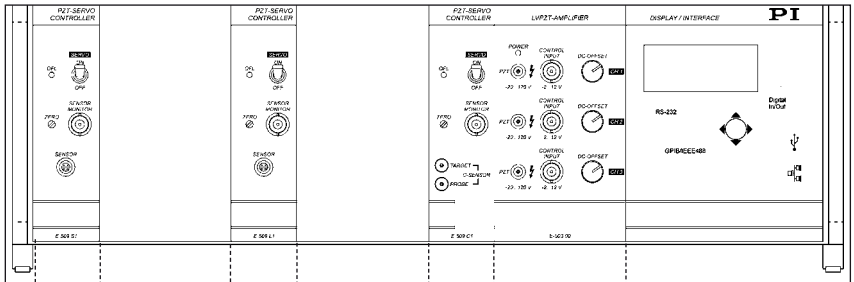
E-500 · E-501 Modular Piezo Controller

System Configuration

E-500, 19" Chassis Models

E-501, 9.5" Chassis

E-500 chassis with the following optional modules: E-503 LVPZT amplifier, three E-509 piezo servo-controllers (E-509.S1: strain gauge; E-509.C1A: capacitive sensor) and DAC interface/display.



	Contr. Slot 3	Amplifier Slot 3	Contr. Slot 2	Amplifier Slot 2	Contr. Slot 1	Amplifier Slot 1	Display/ Interface Slot
Installable Amplifier Modules							
E-503.00 (-20 to 120 V, 3 ch) / E-503.00S*						◪	
E-504.00 (-30 to 135 V, 1 ch) / E-504.00S*		■		■		◪	
E-505.00 (-20 to 120 V, 1 ch) / E-505.00S*		■		■		◪	
E-508.XX (+3 to 1100 V, 1 ch)		■		■		◪	
Installable Sensor & Position Servo-Control Modules							
E-509.C1A (Capacitive, 1 ch)	■		■		◪		
E-509.S1 (SGS, 1 ch)	■		■		◪		
E-509.C2A (Capacitive, 2 ch)					◪		
E-509.C3A (Capacitive, 3 ch)					◪		
E-509.S3 (SGS, 3 ch)					◪		
Installable Display/Interface Modules							
E-515 (1 / 3 ch)							◪
E-517 (1 / 3 ch)							◪
Minimal Configuration, Piezo Amplifier Function only							
		■		■		◪	
Extended Configuration, Piezo Amplifier with additional Position Servo-Controller							
	■	■	■	■	◪	◪	
Extended Configuration, Piezo Amplifier with additional Display/Interface, no Servo-Controller							
		■		■		◪	◪
Extended Configuration, Piezo Amplifier with additional Servo-Controller and Display/Interface							
	■	■	■	■	◪	◪	◪

■ Can be installed in E-500 ◪ Can be installed in E-501 or E-500

* For differential tip/tilt systems with one fixed voltage of +100 V.

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Configuration Examples

- **Low-Voltage Piezo Amplifiers, 3 Channels (14 W), Medium Dynamics, No Display:**

  1 x E-501.00
  9½"-Chassis for Modular Piezo Controller System, 1 to 3 Channels

  1 x E-503.00
  Piezo Amplifier Module, -20 to 120 V, 3 Channels

- **High-Voltage Piezo Amplifier for PICA™, 3 Channels, with PC Interface and Display:**

  1 x E-500.00
  19"-Chassis for Modular Piezo Controller System, 1 to 3 Channels

  3 x E-508.00
  HVPZT-Piezo Amplifier Module, +3 to +1100 V, 1 Channel

  1 x E-517.i3
  Interface / Display Module, 24 Bit D/A, TCP/IP, USB, RS-232, 3 Channels

- **High-Voltage Piezo Amplifier / Servo-Controller (Strain Gauge Sensors), 3 Channels, with PC Interface and Display:**

  1 x E-500.00
  19"-Chassis for Modular Piezo Controller System, 1 to 3 Channels

  3 x E-508.00
  HVPZT-Piezo Amplifier Module, +3 to +1100 V, 1 Channel

  1 x E-509.S3
  Sensor / Piezo Servo-Control Module, SGS-Sensors, 3 Channels

  1 x E-517.i3
  Interface / Display Module, 24 Bit D/A, TCP/IP, USB, RS-232, 3 Channels

- **Position Feedback Control of a P-734.2CL XY Nanopositioning Stage (Capacitive Position Sensors), Minimum Response Time, Analog Control:**

  1 x E-500.00
  19"-Chassis for Modular Piezo Controller System, 1 to 3 Channels

  2 x E-505.00
  Piezo Amplifier Module, 200 W, -20 to 120 V, 1 Channel

  1 x E-509.C2A
  Sensor / Piezo Servo-Control Module, Capacitive Sensors, 2 Channels

- **Position Feedback Control of a P-733.2CL XY Nanopositioning Stage (Capacitive Position Sensors) and P-721.CLQ PIFOC® Objective Positioner (Capacitive Position Sensor), Medium Dynamics, PC Control, Compact Design:**

  1 x E-501.00
  9½"-Chassis for Modular Piezo Controller System, 1 to 3 Channels

  1 x E-503.00
  Piezo Amplifier Module, -20 to 120 V, 3 Channels

  1 x E-509.C3A
  Sensor / Piezo Servo-Control Module, Capacitive Sensors, 3 Channels

  1 x E-517.i3
  Interface / Display Module, 24 Bit D/A, TCP/IP, USB, RS-232, 3 Channels

- **Position Feedback Control of a S-325 Tip/Tilt Platform (Strain Gauge Sensors), Minimum Response Time, Analog Control:**

  1 x E-500.00
  19"-Chassis for Modular Piezo Controller System, 1 to 3 Channels

  2 x E-505.00
  Piezo Amplifier Module, 200 W, -20 to 120 V, 1 Channel

  1 x E-505.00S
  Offset Voltage Supply for Tip/Tilt Systems, One Fixed Voltage of +100 V

  1 x E-509.S3
  Sensor / Piezo Servo-Control Module, SGS-Sensors, 3 Channels

- **Position Feedback Control of a P-733.2CL XY Nanopositioning Stage (Capacitive Position Sensors) and a P-721.SL2 PIFOC® Objective Positioner (Strain Gauge Position Sensor), Minimum Response Time, Analog Control:**

  1 x E-500.00
  19"-Chassis for Modular Piezo Controller System, 1 to 3 Channels

  3 x E-505.00
  Piezo Amplifier Module, 200 W, -20 to 120 V, 1 Channel

  1 x E-509.C2A
  Sensor / Piezo Servo-Control Module, Capacitive Sensors, 2 Channels

  1 x E-509 .S1
  Sensor / Piezo Servo-Control Module, SGS Sensor, 1 Channel

- **Position Feedback Control of 3 P-841.10 Piezo Translators (Strain Gauge Position Sensors), Medium Dynamics, Analog Control, with Future Upgrade Option for High-Power, High-Dynamics Amplifiers E-505 (Large Chassis):**

  1 x E-500.00
  19"-Chassis for Modular Piezo Controller System, 1 to 3 Channels

  1 x E-503.00
  Piezo Amplifier Module, -20 to 120 V, 3 Channels

  1 x E-509.S3
  Sensor / Piezo Servo-Control Module, SGS-Sensors, 3 Channels

  Option:

  1 x E-515.03
  Display Module for Piezo Voltage and Displacement, 3 Channels

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