

**This product family has been replaced by the following new product:**

**>> C-867 Controller for PLine® Piezo LinearDrives**

# C-866

## High-Speed, Closed-Loop Controller / Driver for PLine® Ultrasonic Piezo Linear Motors



PLine® micro linear stage with 19 mm travel range and 0.1 µm resolution with C-866.161 controller

- Optimized for PLine® Piezo Linear Motors
- High-Speed Encoder Input
- PID Servo Algorithm with Dynamic Parameter Switching
- Integrated Piezomotor Drive Electronics
- 3 TTL-Inputs, 3 TTL-Outputs
- Analog Input
- Extensive Software Support

The C-866 motion controller was specially designed for closed-loop positioning systems with PLine® ultrasonic piezo linear drives. This compact unit contains not only servo-control and communications circuitry, but also the drive electronics.

### Specialized Servo Algorithms for Ultrasonic Motors

The C-866 uses a highly specialized DSP (Digital Signal Processor) to handle the PID servo-control algorithm as well as other system functions. Because of the motion properties typical for ultrasonic piezomotors, the controller has a number of special features, including dynamic control parameter adaptation. The high-bandwidth encoder input with a limit frequency of 35 MHz supports the high velocities of ultrasonic piezomotor stages, even at high resolution.

### Integrated Drivers for Piezomotors

To reduce the number of components in the PLine® posi-

tioning system, the piezomotor drive electronics has been integrated in the controller. Various versions of the controller are available, depending on the piezomotor used.

The C-866.161 version, for example, contains the drive electronics for the P-661 motor (page 10-14 f), which is used in the M-663 (page 10-16 f) micro linear stage.

To assure the best possible system performance in terms of force, velocity up to several 100 mm/s and settling times of a few tens of milliseconds, the integrated drive electronics is fine-tuned to the connected actuator / stage at the factory.

### Software / Programming

In addition to the user software for setup, system optimization and operation, comprehensive LabView™ and DLL libraries are provided.

Communication with the C-866 is provided either through the RS-232 or the USB interface. For manual control, the unit can be operated with a joystick on the host PC.

The PIMikroMove® user software provides the PITuning-Tool for system performance optimization. Graphic displays show the system's behaviour and facilitate parameter setting.

Optionally, the C-843.ATS Auto-Tuning software is available; it determines the ideal settings automatically.

### PI General Command Set (GCS)

The comprehensive command structure is based on the PI General Command Set (GCS). With GCS the development of

### Ordering Information

**C-866.161**  
Piezomotor Controller with Drive Electronics, 1 Channel, for PLine® Systems with P-661 Motors

**C-866.164**  
Piezomotor Controller with Drive Electronics, 1 Channel, for PLine® Systems with P-664 Motors

**C-866.165**  
Piezomotor Controller with Drive Electronics, 1 Channel, for PLine® Systems with P-665 Motors

**C-866.D64**  
Piezomotor Controller with Drive Electronics, 1 Channel, for PLine® Systems with M-674 RodDrive

### Accessories

**C-843.ATS**  
Auto-Tuning Software Option

**Ask about custom designs!**

custom application programs is simplified, because the commands for all supported devices are identical in syntax and function. PI controllers for nanopositioning systems, for piezomotors and servo or stepper motors can be commanded with GCS.

### Advantages of PLine® Micropositioning Systems

The ultrasonic piezoceramic drives used in PLine® micro-positioners have a number of advantages over classical drives:

- Higher Accelerations, up to 10 g
- Speeds up to 500 mm/s
- Small Form Factor
- Self-Locking When Powered Down
- No Shafts, Gears or Other Rotating Parts
- Non-Magnetic and Vacuum Compatible Drive Principle

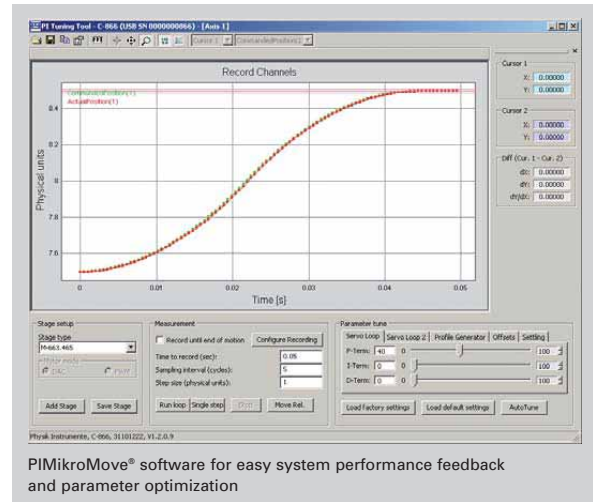
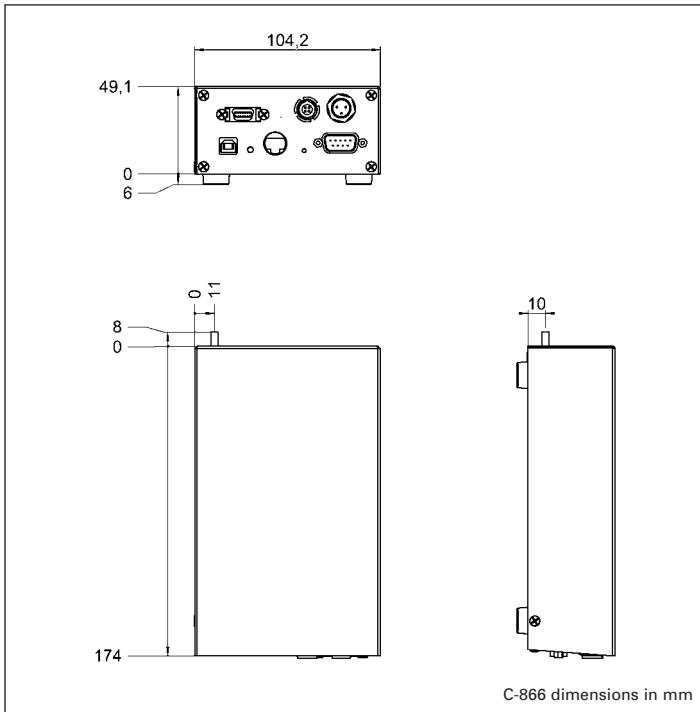
### Application Examples

- Biotechnology
- Fiber positioning
- Automation
- Photonics / integrated optics
- Quality assurance testing
- Testing equipment

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Piezo • Nano • Positioning



## Technical Data

	C-866.161	C-866.164	C-866.D64	C-866.165
Function	Controller / driver for PLine® piezomotor systems			
Drive type	PLine® P-661 motors	PLine® P-664 motors	PLine® RodDrive M-674	PLine® P-665 motors
Channels	1	1	1	1
<b>Motion and control</b>				
Servo characteristics	Programmable PID V-ff filters, parameter changes on-the-fly			
Trajectory profile	Trapezoidal, S-curve			
Processor	Motion chip, 2.5 kHz servo update rate			
Encoder input	A/B (quadrature) differential signals, 35 x 10 <sup>6</sup> counts/s			
Stall detection	Servo off, triggered by programmable position error			
Limit switches	2 TTL lines, programmable			
Reference switch	1 TTL line, programmable			
<b>Electrical properties</b>				
Operating voltage	12 VDC from external power supply (included in delivery)			
Output power/channel	3 W	8 W	18 W	5 W
Output voltage/channel	0 to 42 V <sub>rms</sub>	0 to 60 V <sub>rms</sub>	0 to 100 V <sub>rms</sub>	0 to 170 V <sub>rms</sub>
Current	300 mA w/o motor	300 mA w/o motor	300 mA w/o motor	300 mA w/o motor
<b>Interfaces and operation</b>				
Communication interfaces	USB 1.1, RS-232, max. 115,200 baud			
Motor connector	MDR14			
I/O ports	Mini DIN 9-pin socket with 3 TTL-inputs, 3 TTL-outputs, 1 analog input (0 to 5 V)			
Command set	PI General Command Set (GCS)			
User software	PIMikroMove®			
Software drivers	GCS-DLL, LabVIEW™ driver			
Manual control	Joystick on host PC			
<b>Miscellaneous</b>				
Temperature range	+10 °C to +50 °C			
Mass	780 g			
Dimensions	174 x 104 x 49 mm (w/o ground stud, w/o rubber feet, w/o rails)			