

C-170

RedStone Open-Loop Controller/Driver for PLine® Ultrasonic Piezo Linear Motors



C-170 RedStone controller with two M-662.470 micro positioning stages.

- Drives 2 PLine® Open-Loop Piezo Linear Motor Stages
- Integrated Programmable Motion Sequencer and Ultrasonic Driver for 2 Axes (No External Driver Required)
- Single 12 VDC Operation
- Stand-Alone Functionality
- Analog Joystick Option
- Network Option for Multi-Axis Applications
- Flash Memory for Motion Sequences and Parameters
- 8 Programmable TTL Input/Output Lines
- 4 Analog Inputs

C-170 RedStone controllers are compact and cost-effective units for the operation of open-

loop PLine® piezo linear motors and stages.

They incorporate programmable microsecond timers and ultrasonic drivers to operate one or two motors and/or micropositioning stages under computer control or in an autonomous stand-alone mode.

Integrated Drive Electronics, Optimized for PLine® Stages and Motors

To assure the best possible system performance, the integrated drive electronics is fine-tuned to the connected stage at the factory. Micropositioning systems such as the M-661/M-662 miniature-stages can then achieve speeds of

500 mm/s and more with minimum incremental motion of 50 nm.

The integrated piezomotor driver electronics is also available as a separate product for use with external pulse generators (ordering number C-181).

Driving PLine® Motors in Open-Loop

The distance and velocity traveled corresponds to the width, frequency and number of motor-on pulses. By varying the pulse width, the step length and thus the motor velocity can be controlled. As the mechanical environment also influences the motion, the size of single steps is not highly repeatable. For precise position control, a system with a position feedback device is recommended (closed-loop operation).

In addition to the single step and step sequence operating modes, RedStone controllers provide a high-speed CW mode with acceleration to 20 g and velocities to 500 mm/s and more. The CW mode is practical for applications where fast end-to-end motion is required, such as shutter or switching applications.

Complete Software Package and Macro Command Language

RedStone controllers come with a complete software package, consisting of DLL and LabView™ drivers and turnkey operating software for all Windows™ systems.

The RedStone high-level command language was derived from the successful C-862 Mercury DC-Motor controller. Motion sequences can be stored in non-volatile memory for execution on demand by software commands or external

Ordering Information

- C-170.161**
RedStone Open-Loop Piezomotor Controller/Driver, 1 Channel, for PLine® Systems with P-661 Motors
- C-170.261**
RedStone Open-Loop Piezomotor Controller/Driver, 2 Channels, for PLine® Systems with P-661 Motors
- C-890.PS**
Wide-Range Power Supply
- C-862.CN**
Network Connecting Cable
- C-862.PB3**
Software-Accessible Push Button Box
- C-819.20**
Analog Joystick

TTL-trigger signals. An auto-start macro can be defined to call macro commands at power-up without the need for computer communications.

Advantages of PLine® Micropositioning Systems

The piezoceramic drives used in PLine® devices have a number of advantages over classical drives:

- Higher accelerations, up to 20 g
- Velocities up to 500 mm/s and more
- Small form factor
- Self-locking when at rest
- No shafts, gears or other rotating parts

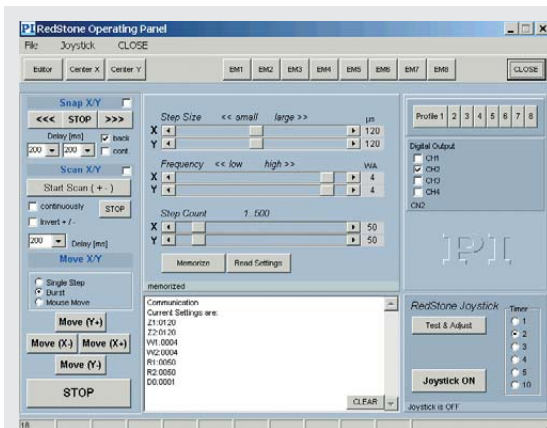
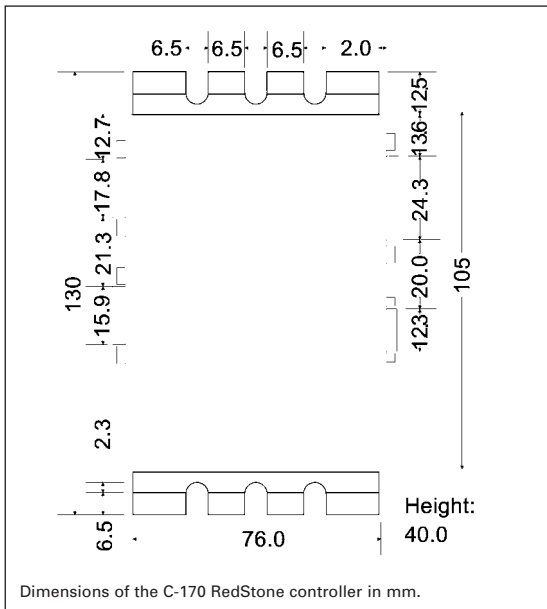
Notes

To reduce the number of components in the system, the piezomotor drive electronics has been integrated in the C-170 controller. The model C-170.161 is optimized for positioners with piezomotors P-661.

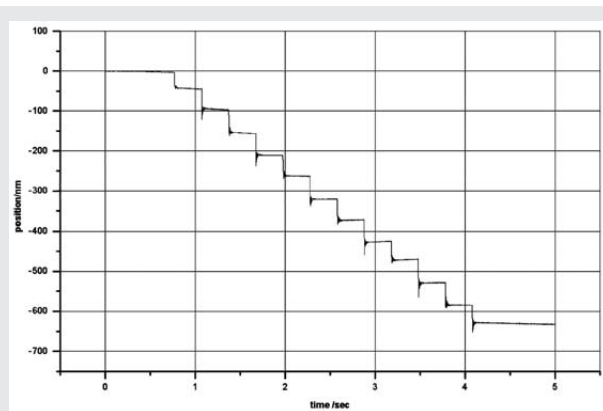
The products described in this document are in part protected by the following patents: US-Patent No. 6,765,335

Application Examples

- Test equipment
- Micromachining
- Scanning applications
- Life sciences
- Metrology
- Quality control
- Switches, shutters, sorters
- R&D
- Photonics packaging automation
- Fiber optic instrumentation



RedStone operating software allows easy setting of the open-loop motion parameters step size, frequency and number of steps within a move (burst).



50 nm steps created with a system consisting of C-170.161 RedStone and PILine® M-662.470 open-loop piezo linear motor stage.

Piezo Actuators

Nanopositioning & Scanning Systems

Active Optics / Steering Mirrors

Tutorial: Piezo-electrics in Positioning

Capacitive Position Sensors

Piezo Drivers & Nanopositioning Controllers

Hexapods / Micropositioning

Photonics Alignment Solutions

Motion Controllers

Ceramic Linear Motors & Stages

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Technical Data

Models	C-170.1xx; C-170.2xx RedStone
Function	Controller/driver for open-loop PILine® piezo linear motors / stages
Axes	1 (C-170.1xx); 2 (C-170.2xx)
Supply voltage	12 V DC from external power supply (included in delivery)
Power	0.6 W idle, 6 W per channel max.
Interface/communication	RS-232, 9600 baud
Network	Daisy-chain up to 8 units, address setting via dip switch
Analog & digital I/O connector	9-pin socket
Command set	40 high-level ASCII commands; 32 macro commands; 1 autostart macro
Weight	310 g
Size	130 x 76 x 40 mm
Firmware	EEPROM resident
Firmware update	via serial port