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Inchworm Controllers

Burleigh offers a family of controllers to harness the high-resolution capabilities of Inchworm motors in a variety of applications. These Controllers use sophisticated PZT drive electronics that provide the voltage, current and timing required for rapid actuation of the drive elements. They are designed for high-speed operation while maintaining the highest possible resolution. They are programmable and can operate from one to three axes (or more) independently or simultaneously in open or closed-loop mode. You can control the Inchworm Motors manually or remotely with TTL signals or RS-232 protocols.

Need Open or Closed-Loop?

Open loop control is the operation of an Inchworm Motor without the benefit of feedback integrated with the controller. All that's needed to operate an Inchworm Motor open loop is to add a simple interface, such as a handset or joystick for manual control or TTL signals for automated control.

For closed loop operation, encoder counting circuitry is coupled with the motion control electronics to provide the ability to set step size and display position. This gives the additional feature of setting a zero point, stepping, movement to a targeted position, and position maintenance.

6000ULN Controller

The 6000ULN is an open loop controller with simple forward and reverse limit switch LED display. Typical applications include:

- Those that will run the motors manually (via handset or joystick) or by TTL input from another device
- Those where actual position measurement is not important
- Those where the position feedback will be integrated in another control device, like your computer.

The 6000ULN Controller can control motor direction, change relative speed, start and stop motion, and actuate a single step.

For manual control, you can use either the 6005 Handset or 6003 Joystick. For remote control, you can operate the 6000ULN with the new 670 Series Computer Interface. This gives direct PC control via LabVIEW in Windows95 or through RS-232 protocols.

6200ULN Controller

The 6200ULN Controller includes all the functions of the 6000ULN, with the addition of closed loop capability. This controller is designed for use with IW-700 Series Inchworm
Motors with integral shaft encoders, TSE Series Integral Encoder Stages, or a user-supplied position measuring device using TTL quadrature signals. These allow the additional capabilities of displaying position, taking steps, and maintaining position.

In manual mode, the 6200ULN operates much like the 6000ULN. Using the 6005 Handset, you can take advantage of the STEP function, which allows the motor to move in predetermined range of motion increments as small as the encoder resolution. Plus, the 6200ULN Controller can reference the Inchworm position to a predetermined zero or home position, and return to that position. Pressing the GO HOME button moves the motor to the zero position.

For remote operation, the 6200ULN can be used in unidirectional or bidirectional communications modes. The unidirectional interface is similar to the 6000ULN. You can access the RUN/HALT, FWD/REV, SPEED, and SINGLE STEP functions and by setting step size on the front panel.

The 6200ULN Controller also provides a bidirectional mode of communication for control of encoded Inchworm Motors. This interface allows the 6200ULN to receive motor control instructions from a system controller and to send position and motor status information. For remote control, you can operate the 6000ULN with the new 670 Series Interfaces. These gives direct PC control via LabVIEW in Windows 95 or through RS-232 protocols. The bidirectional interface allows the user to:

- Load an absolute target value
- Load a step size
- Set motor speed
- Read the current motor position
- Read the status of motor and controller
- Control position maintenance (On/Off)
- Perform motor stall test
- Set zero reference and clear counter

ARIS-950ULN Controller
The ARIS-950ULN is specifically designed to control Inchworm Motors for the rigors of probe-to-sample positioning in Scanning Probe Microscope applications.

The ARIS-950ULN provides several enhancements over other Inchworm Motor Controllers. The force of the piezoelectric clamps can be individually adjusted to maximize the efficiency of motion. The clamping signals are shaped to provide the smoothest possible motion. The ARIS-950ULN allows the user to totally isolate the Inchworm Motor from the electrical controller while holding position with the clamps fully charged. This assures the highest possible imaging resolution. A special ARIS-1010 Handset is used to control the Inchworm motor.
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