

Picard Industries

Specializing in Miniature Smart Motors and Sensors

Programmable Solenoid (PPS-2)

- Small 1.0" diameter motor
- Simple Control Interface – only 3 wires: Power, Ground and CMD signal
- Constant Current / Force
- Ball bearing brushless stepper (for longer life)
- .001" position resolution
- +/-0.0005" position repeatability
- Onboard programming
- Status LEDs to verify solenoid motion
- Wide operating voltage (12 volts to 28 volts)
- Self-contained electronics



The new Picard Programmable Solenoid (PPS-2) delivers the motion capability of a sophisticated stepper motor system with the simplicity of a linear solenoid. A solenoid can now have a smooth motion without the need for an expensive motor control system. The PPS-2 provides the motion of a linear solenoid without the non-linear force and erratic banging motion against a hard stop. The electronics of the PPS-2 allows the user to program and store the desired motion profile using the simple user interface. Three buttons and two LEDs are used to set the distance of motion and velocity. After programming, the PPS-2 operates as a linear solenoid. The PPS-2 requires power, ground, and a control signal. The control signal extends or retracts the solenoid. Any device that can connect a wire to ground (switch, sensor, PLC, an open-collector or open-drain transistor output, etc.) can control the PPS-2. The innovative PPS-2 gives programmability to the motion of a linear solenoid without the expense of a costly motor control system.

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Servo Designs[™]

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Mating Connector Pin Outs

- PIN 1 **Power** (12-28 volts at 0.5 amps maximum)
- PIN 2 **Ground** (power return path)
- PIN 3 **CMD** signal (commands the solenoid to extend when connected to ground, to return to home when open)
- PIN 4 **ACK** signal (optical feedback, logic Hi when in the home position. Logic Lo when in the extended position)
- PIN 5 **Reset** (optional signal used to remotely reset an error condition, resets the PPS-2 when connected to Ground, runs normally when left open)

Molex P/N 50-57-9405 Pins P/N 16-02-0103

Operation

The PPS-2 has two modes of operation, **RUN** and **PGM** (program). The PPS-2 defaults to **RUN** mode on power up. In this mode, the PPS-2 operates as a linear solenoid. The PPS-2 is controlled through the five pin latch connector. This connection supplies power, ground and the **CMD** (command) signal. Optional is an **ACK** (acknowledge) signal. This signal provides feedback and motion status. To extend the solenoid, the **CMD** signal is connected to ground. This will cause the **CMD** LED (red) to be lit. The **ACK** signal will sink to ground when the solenoid is fully extended, causing the **ACK** LED (yellow) to light. When the **CMD** signal is open (not grounded), the **CMD** LED will go out and the solenoid will begin retracting to its home position. When it reaches home position, the **ACK** signal will go to a 5-volt level, and the **ACK** LED will turn off. This signifies the completion of the motion. The motions (both extending and retracting) will use the motion profiles programmed by the user. The **MODE** LED (green) is not lit when in the **RUN** mode.

The **MODE** LED (green) will be lit when in the **PGM** mode. To enter this mode, both the **INC** and **DEC** switch should be depressed and held until the **MODE** LED becomes lit (approximately 3 seconds). You are now in the programming mode. The **SEL** button is now used to select which of the two parameters you can program. They are "Position" and "Velocity." By momentarily pushing the **SEL** button, the **MODE** LED will begin to blink differently. One blink denotes the Position parameter, and two blinks denote Velocity. When the LED is lit but not blinking, the user can leave the programming mode by holding both the **INC** and **DEC** button until the **MODE** LED extinguishes.

Programming

When entering the "Position" parameter mode (one blink), the solenoid will extend to its current programmed position. The up and down buttons on the solenoid control board are used to move (signal step) the solenoid to a new position. Push the **SEL** button to store this new position. The solenoid will now return to its home (retracted) position.

When entering the "Velocity" parameter programming mode (two blinks), the **ACK** LED will also blink to indicate which velocity value is currently selected (there are over ten selectable velocity values). One blink of the **ACK** LED is the fastest speed value. The more it blinks, the slower it moves. Use of the up and down buttons can change the blinking of the LED until the desired speed is reached. Pushing the **SEL** button will store your new velocity and move on to the beginning of the **PGM** mode (**MODE** LED on without blinking.)

At the beginning of the **PGM** mode (**MODE** LED on steady), it is optional to continue reprogramming the two parameters or leaving the **PGM** mode back to the **RUN** mode. To continue reprogramming, push the **SEL** button and follow the instructions above. To leave the **PGM** mode, depress and hold both the **INC** and **DEC** button until the **MODE** LED extinguishes (approximately 3 seconds). Now it returns to the **RUN** mode. Pushing the **SEL** button can now test your new motion profile. If the new motion is correct, you have completed the programming and the PPS-2 will now operate using the new stored parameters. If the motion is still not correct, re-enter the **PGM** mode and select new parameters to achieve the desired motion profile.

Customization

The parameter values available with the PPS-2 should satisfy the vast majority of applications. If your needs are specialized, a custom solenoid may be necessary. Picard Industries can customize the software for your specific application. We can scale the PPS-2 design to bigger or smaller sized motors. Please contact us to discuss your needs.

The cost of the PPS-2 unit is \$145.00 or \$135.00 for orders of 10 or more, plus additional shipping and handling.