Motorized Valve Control

A typical scenario where a motorized valve is used is to regulate the flow of fluid which in turn impacts the loop process value. A valve is opened or closed by closing contacts to drive the value in the intended direction. Motorized Valves come in a number of configurations.

Some valves have a position feedback mechanism that allows the control to measure the valve's position via an internal potentiometer called slide-wire. The controller can measure the potentiometer resistance to determine the initial valve position on power up.

This method may not be desirable for three reasons:
1) It requires a second input on the controller to measure valve position.
2) The controller and the valve are more expensive.
3) Additional wiring is required for the slide-wire feedback.

Other valves take an analog signal and have a localized control mechanism that regulates the valve position. These are typically more expensive valves because of the control mechanism built-in plus it requires an analog signal which is not always available. The actual valve position is not critical because it is a part of a closed loop control.

The Motorized Valve control algorithm is designed to work with another type of valve.

To use the motorized feature, the user programs the Special Output Function to Motorized Valve. Then the Source Function A is selected to either Heat or Cool Power and Source Instance A is set to match the control loop, typically 1.

Next the user enters the amount of time in seconds that the valve requires power to go from a closed state to an open state. The user enters the dead band in percent PID power to prevent the valve from excessive cycling. Larger numbers reduce activity on the valve and smaller numbers improve controllability. Select a value that compromises on these two competing goals.

Lastly, assign an output to Special Output Function 1 that is wired to close the valve. Assign an output to Special Output Function 2 that is wired to open the valve. Typically, these two outputs are normally open mechanical relays but solid state relays or switch DC outputs may be programmed in the same manner.

Current Position is an approximation of the valve's position as it relates to a power level (0 - 100%) where 0% is fully closed and 100% is fully open.
Dead Time is the minimum on time that the valve will travel once it is turned on in either the closed or open direction. **Dead Time** = **Valve Dead Band** / 100 * **Valve Travel Time**.
OnTime is the amount of time the valve needs to be turned on (either open or close) to eliminate the error between the estimated valve position and the desired power level. A positive **OnTime** value indicates the

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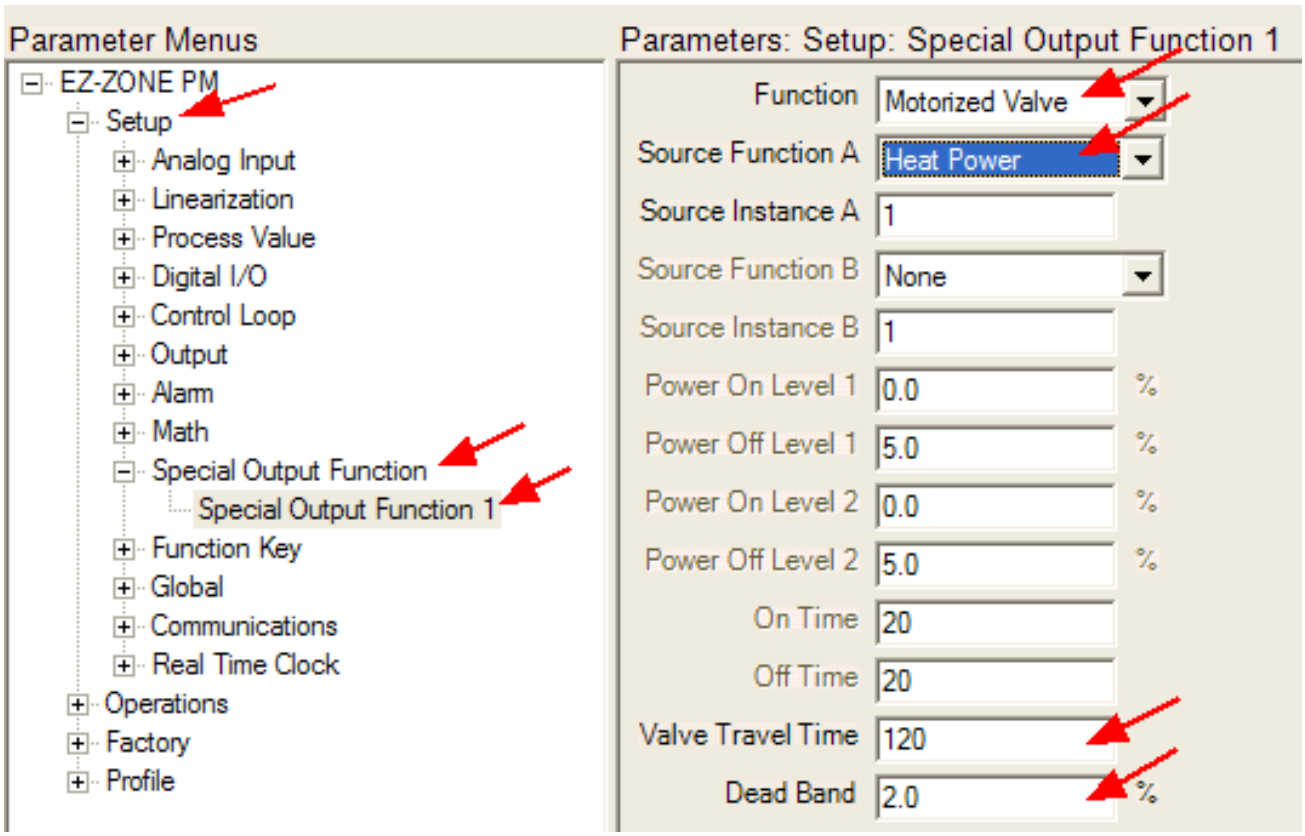
need to open the valve while a negative value indicates the need to close the valve. **OnTime** = (**Input 1 Value - Current Position)** / 100 * **Valve Travel Time**
When power is applied to the controller, the valve is closed and time is set to 0.
Special Output Function 1 is the close signal to the valve.
Special Output Function 2 is the open signal to the valve

The following screen shots draw attention to the required settings of an EZ-ZONE PM using EZ Configurator software. Only those parameter labels in black lettering require settings.



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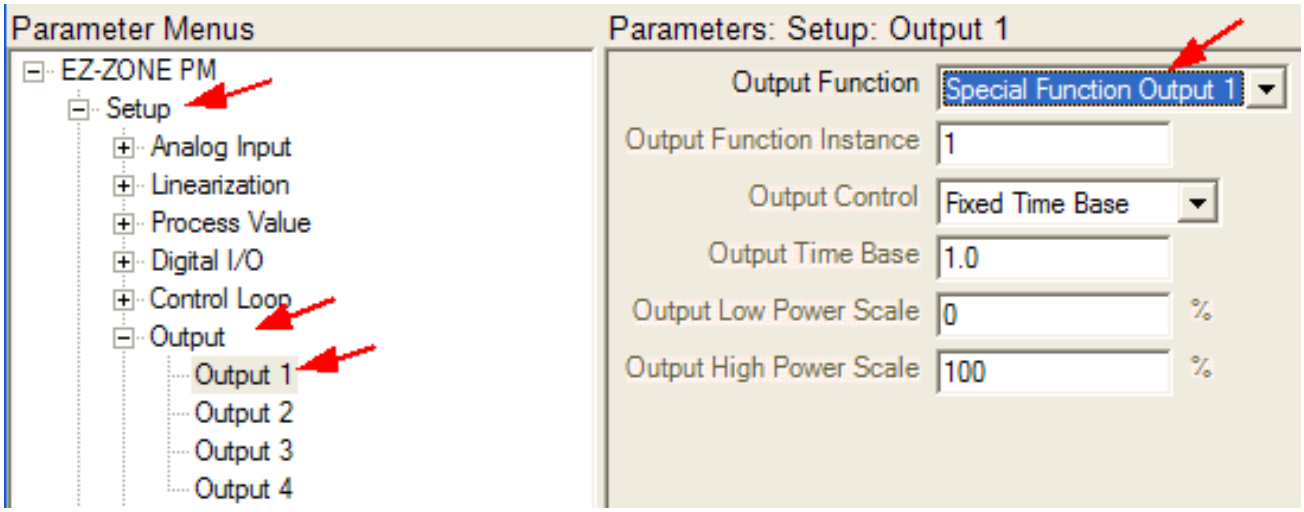

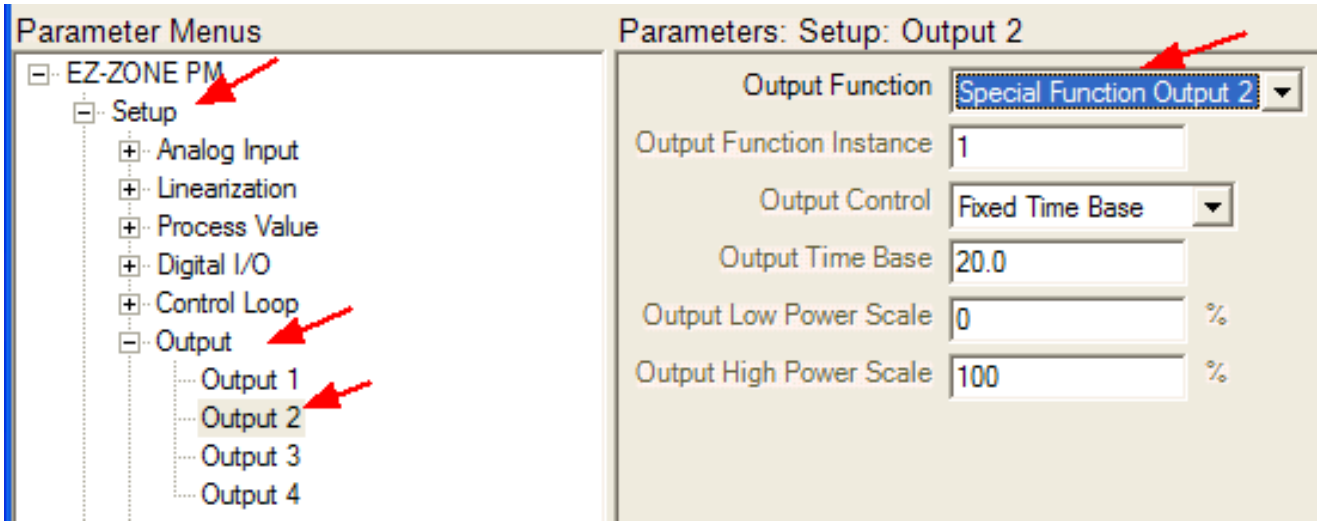

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