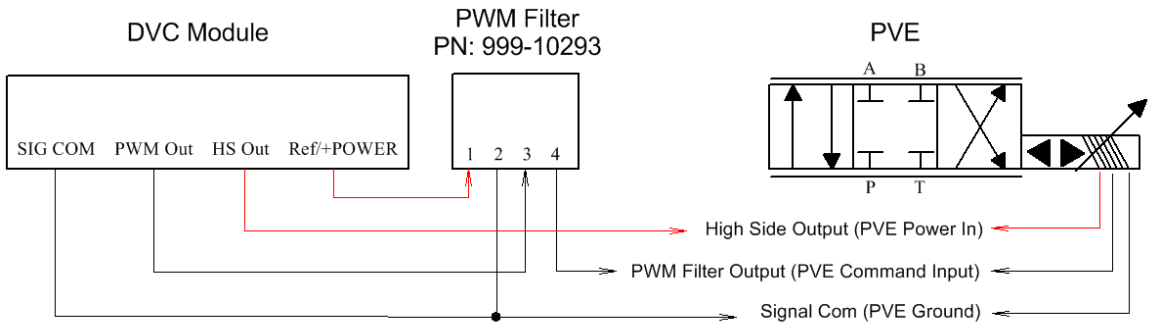
Using the PWM Filter, 999-10293

Introduction

The 999-10293, PWM Filter may be used with a DVC710, DVC707, DVC750 or similar DVC proportional module to convert a sinking PWM output to a sourcing DC voltage output that has a range of 0 Volts to its input supply voltage. It is typically used to drive PVE type valves but may be used as a 0V to 5V output by simply using the DVC's Reference output voltage as the power input to the PWM Filter. The PWM Filter will supply up to 4mA on a 24 volt system and 2ma on a 12 volt system.

Simplified Wiring for PVE Valve



Programming the DVC to Drive the PVE Valve

The following points should be considered when programming the DVC to drive the filter output.

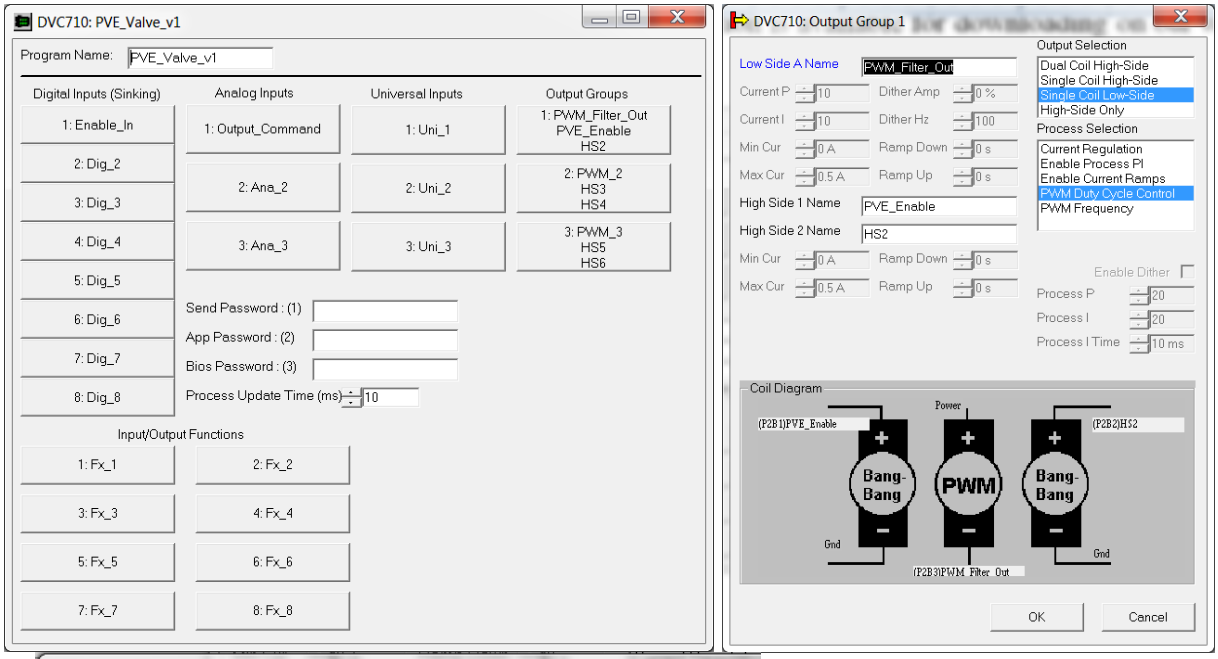
1. When commanding a device such as a PVE type valve using the PWM Filter, the output command to the device will be inversely proportional to the command to the PWM output. Therefore you must invert commands to the output in order to obtain standard directional outputs from the cylinder, motor, etc.
2. To prevent unexpected mechanical operation when initializing a system, enable and set the PWM output to a neutral setting (typically 50%) before enabling (applying power to) the PVE Valve with the HS output.
3. Run the PWM output group in Single Coil High Side, PWM Duty Cycle Mode.
4. When using a High Side Output to provide power to a PVE valve, set the variable *HSname*.opendisable to true to prevent false open detection on the High Side Output.

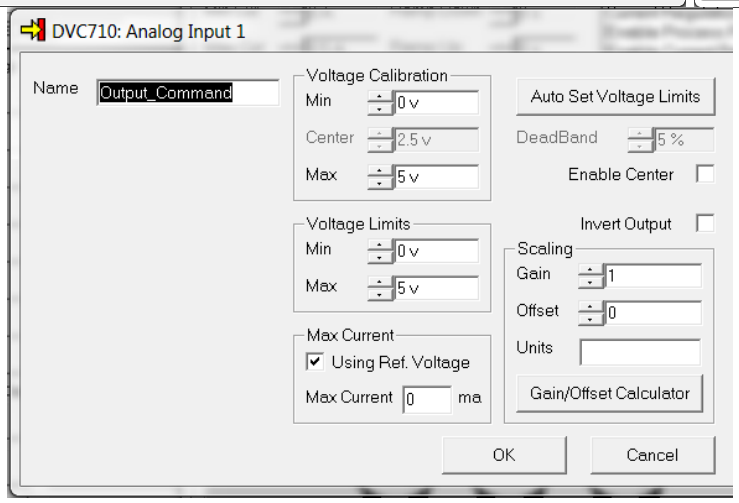
Sample DVC Code

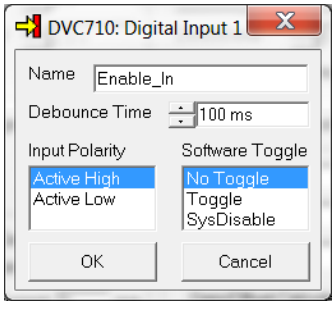
This code example includes all considerations listed above as well as a Ramp feature that may be adjusted through EEMEM. Valid settings for the EEMEM variable, Ramp_Scaler are, 0 – 100. The program will automatically clamp this at 100. This corresponds to about 5 seconds per side or 10 seconds end to end.

The sample application is attached to this PDF file.

Module I/O Settings







Always Code

```
Output_Demand = 1023 - Output_Command
PWM_Filter_Out.enable = Enable_In
PVE_Enable.opendisable = 1

if (Enable_In = True) then
   if ((Output_Command < 460) OR (Output_Command > 563)) AND (Input_Ready = 0) then
      PWM_Filter_Out = 512
   else
      if (Output_Demand > PWM_Filter_Out) then
         if (Output_Demand > (PWM_Filter_Out + Ramp_Scaler)) then
            PWM_Filter_Out = PWM_Filter_Out + Ramp_Scaler
         else
            PWM_Filter_Out = Output_Demand
         end if

         if (PWM_Filter_Out > 1023) then
            PWM_Filter_Out = 1023
         end if
      else
         if (Output_Demand < (PWM_Filter_Out - Ramp_Scaler)) then
            if (PWM_Filter_Out > Ramp_Scaler) then
               PWM_Filter_Out = PWM_Filter_Out - Ramp_Scaler
            else
               if (PWM_Filter_Out > 0) then
                  PWM_Filter_Out = PWM_Filter_Out - 1
               end if
            end if
         else
            PWM_Filter_Out = Output_Demand
         end if
      end if

      Input_Ready = 1

   end if
else
   Output_Demand = 512
   Input_Ready = 0
end if

PVE_Enable = Input_Ready

if (Ramp_Scaler > 100) then
   Ramp_Scaler = 100
   eecommand = eewrite
else
   eecommand = 0
end if

'***** Program Variables *****
dim Ramp_Scaler as eemem

dim Input_Ready as uint
dim Output_Demand as uint
```