PWM CONTROLS INC.

PVD4R11

Proportional Valve Driver, two PWM solenoid outputs, DIN rail mount

BENEFITS AND FEATURES:

- Versatile digital design
- WiFi user interface for complete control and status information
- Compatible with most internet enabled devices and browsers
- Wide range of supply voltage
- Electronic limiting circuit / short circuit proof
- Load can be connected & disconnected live
- Protected against wrong connection
- Energy-efficient PWM circuit, no heat sink is required
- Current sensing maintains output regardless of changes in supply voltage and coil resistance
- Simple control with analog input, 5V/200mA supplied for joystick or other accessories
- Can be used either for one dual solenoid valve or for two independent single solenoid valves

SPECIFICATIONS:

- Operating voltage: 9 - 36VDC
- Maximum output current: 4A
- Ramp time: 0.0 to 1000.0s
- Linearity: 0.5%
- PWM / Dither frequency: 33-1000Hz
- Operating temperature: -40° to +80° Celsius
- Input signals: up to (+/-)10V and/or 20mA
- Contains FCC ID: 2AHMR-ESP12S
- Size: 3.5"H x 1.4"W x 1.3"D

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PWM Controls User Interface

| Data Sheet | Monitor | Setup | Save | Reserved |

	A	B	
IN1 input	15.87	OFF	mA
IN2 input	ON	5.68	V
Target	1.35	0.54	A
Output	1.35	0.54	A
Duty Cycle	40.9	17.3	%
Impedance	3.7	3.8	Ω
Supply Voltage		11.7	V
Temperature		48.0	°C

CONFIGURATION. The driver can be used:

for two single solenoid valves, controlled by two independent analogue signals or

for one dual solenoid valve, controlled by one analogue signal or by the difference between two analogue signals.

INPUTS:

milliamp signal 0 to 21.99mA or any subrange thereof, applied to IN1(A or B)
while IN2(A or B) accepts ON/OFF signal

voltage signal 0 to 10.99V or any subrange thereof, applied to (IN2 - IN3)(A or B)
while IN1(A or B) accepts ON/OFF signal

ON/OFF signal functions: Alternate Output Range, Enable Output or Disable Ramps

See wiring diagrams to the right

OUTPUTS:

two PWM outputs with frequency adjustable from 33 to 1000Hz
current or duty cycle proportional to the analogue input
the return is connected to ground for most versatility

The output is disabled when the signal applied to the input is outside set range. If output needs to remain enabled, the input range must be set within the expected signals applied.

RAMPS:

Rate of rise or fall of output can be independently adjusted.
The setting is the amount of time it takes for output to ramp through the full range.

USER INTERFACE:

WiFi, compatible with most internet enabled devices and browsers. It allows the user to monitor the status and change the settings of the driver.

INDICATOR LIGHTS:

WiFi: flashing - ready to connect / solid - connected
Power: green
Fault: red

FAULT CONDITIONS:

load is less than 0.1Ω (short) or more than 199Ω (open) or
output exceeded 4A or
milliamp input exceeded 22mA.

Fault status is reset as soon as fault condition is removed.

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input configurations:

milliamp input

positive Volts input

negative Volts input
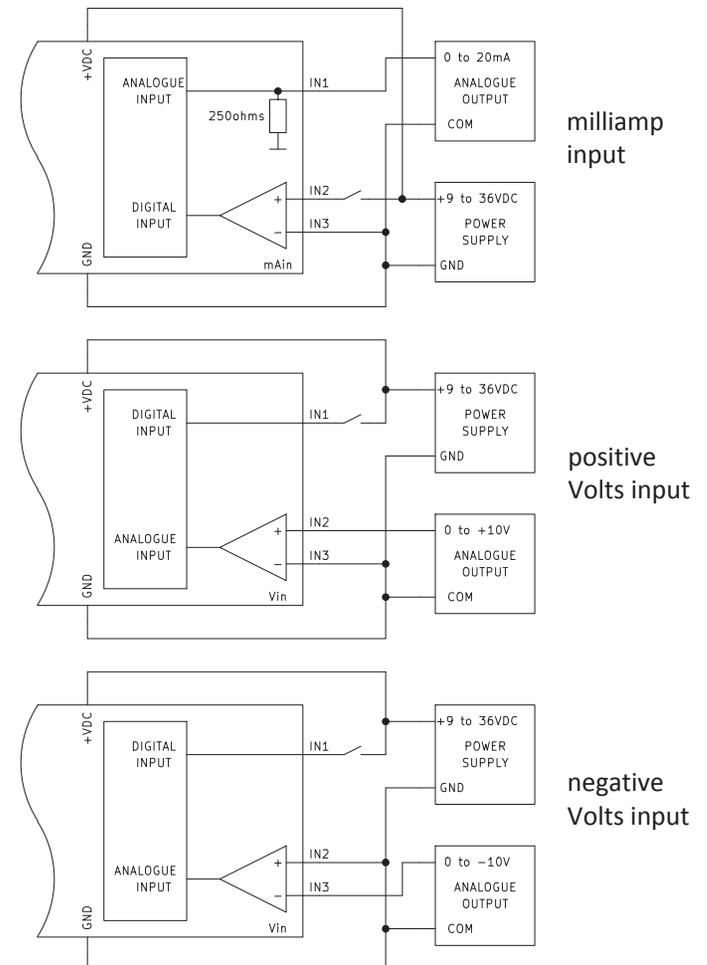
configuration and wiring diagram example 1.4 for

two independent single solenoid valves:

potentiometer and output enable switch for valve A

4-20mA signal and ramp disable switch for valve B

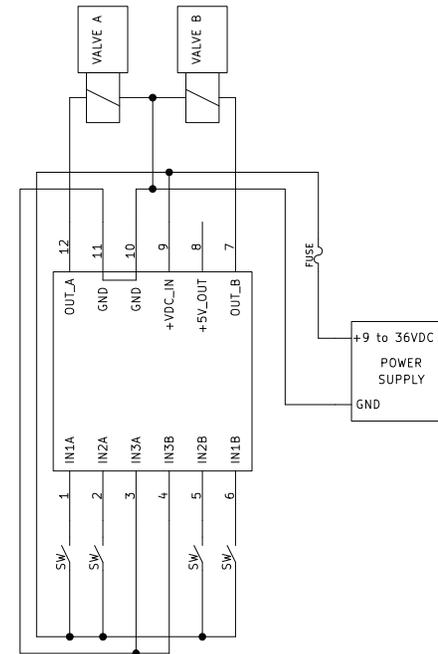| IN2A Range	0.10	to	5.10	V
Solenoid A				
Input selection	IN A			
Output Range	0.20	to	0.80	A
Alternate Output Range	0.40	to	1.60	A
Ramp Up			4.0	s
Ramp Down			2.0	s
PWM Frequency			180	Hz
IN1A Function	Enable Output			
IN1B Range	3.90	to	20.10	mA
Solenoid B				
Input selection	IN B			
Output Range	0.50	to	3.50	A
Alternate Output Range	0.40	to	1.60	A
Ramp Up			20.0	s
Ramp Down			10.0	s
PWM Frequency			140	Hz
IN2B Function	Disable Ramps			
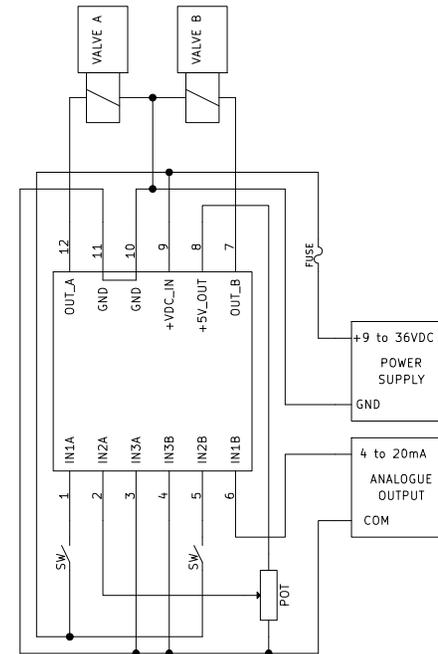
configuration and wiring diagram example 1.5 for

two independent single solenoid valves:

two switches to select one of four presets for each valve

IN1A	IN2A	OUT_A
OFF	OFF	0.20
OFF	ON	0.40
ON	OFF	0.60
ON	ON	0.80

IN1B	IN2B	OUT_B
OFF	OFF	0.50
OFF	ON	1.50
ON	OFF	2.50
ON	ON	3.50

| IN2A Range	0.00	to	10.99	V
Solenoid A				
Input selection	IN A			
Output Range	0.20	to	0.40	A
Alternate Output Range	0.60	to	0.80	A
Ramp Up			0.1	s
Ramp Down			0.1	s
PWM Frequency			180	Hz
IN1A Function	Alternate Output Range			
IN2B Range	0.00	to	10.99	V
Solenoid B				
Input selection	IN B			
Output Range	0.50	to	1.50	A
Alternate Output Range	2.50	to	3.50	A
Ramp Up			30.0	s
Ramp Down			15.0	s
PWM Frequency			140	Hz
IN1B Function	Alternate Output Range			

configuration and wiring diagram example 2.4 for

dual solenoid valve:

-10V to +10V signal and low/high range switch

IN2A Range	0.10	to	10.10	V
Solenoid A				
Input selection	IN A – IN B			
Output Range	0.20	to	0.80	A
Alternate Output Range	0.40	to	1.60	A
Ramp Up			1.0	s
Ramp Down			1.0	s
PWM Frequency			150	Hz
IN1A Function	Alternate Output Range			
IN2B Range	0.10	to	10.10	V
Solenoid B				
Input selection	IN B – IN A			
Output Range	0.20	to	0.80	A
Alternate Output Range	0.40	to	1.60	A
Ramp Up			1.0	s
Ramp Down			1.0	s
PWM Frequency			150	Hz
IN1B Function	Alternate Output Range			
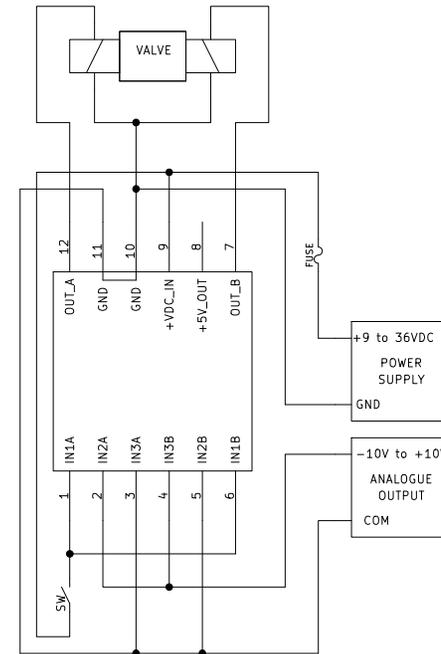
configuration and wiring diagram example 3.4 for

dual solenoid valve:

0-10V signal and enable switch

duty cycle output

| IN2A Range	5.10	to	10.10	V
Solenoid A				
Input selection	IN A			
Output Range	15.0	to	75.0	%
Alternate Output Range	5.0	to	95.0	%
Ramp Up			1.0	s
Ramp Down			1.0	s
PWM Frequency			33	Hz
IN1A Function	Enable Output			
IN2A Range	0.00	to	4.90	V
Solenoid B				
Input selection	IN A			
Output Range	75.0	to	15.0	%
Alternate Output Range	95.0	to	5.0	%
Ramp Up			1.0	s
Ramp Down			1.0	s
PWM Frequency			33	Hz
IN1B Function	Enable Output			
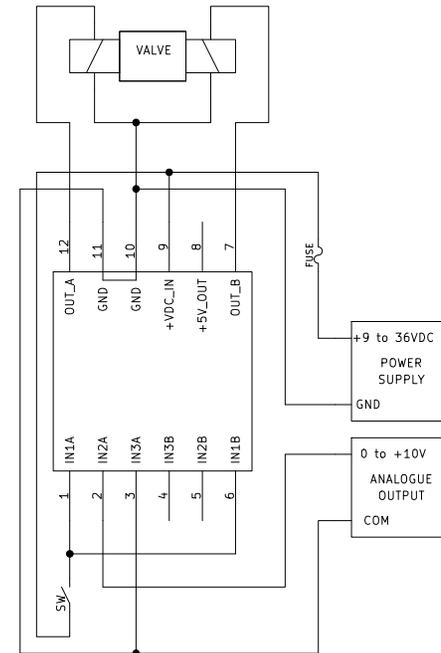
configuration and wiring diagram example 4.4 for

two dual solenoid valves:

two-axis hall effect joystick and low/high range switch

IN2A Range	2.60	to	4.60	V
Solenoid A				
Input selection	IN A			
Output Range	0.20	to	0.80	A
Alternate Output Range	0.40	to	1.60	A
Ramp Up			0.5	s
Ramp Down			0.5	s
PWM Frequency			200	Hz
IN1A Function	Alternate Output Range			
IN2A Range	0.40	to	2.40	V
Solenoid B				
Input selection	IN A			
Output Range	0.80	to	0.20	A
Alternate Output Range	1.60	to	0.40	A
Ramp Up			0.5	s
Ramp Down			0.5	s
PWM Frequency			200	Hz
IN1B Function	Alternate Output Range			
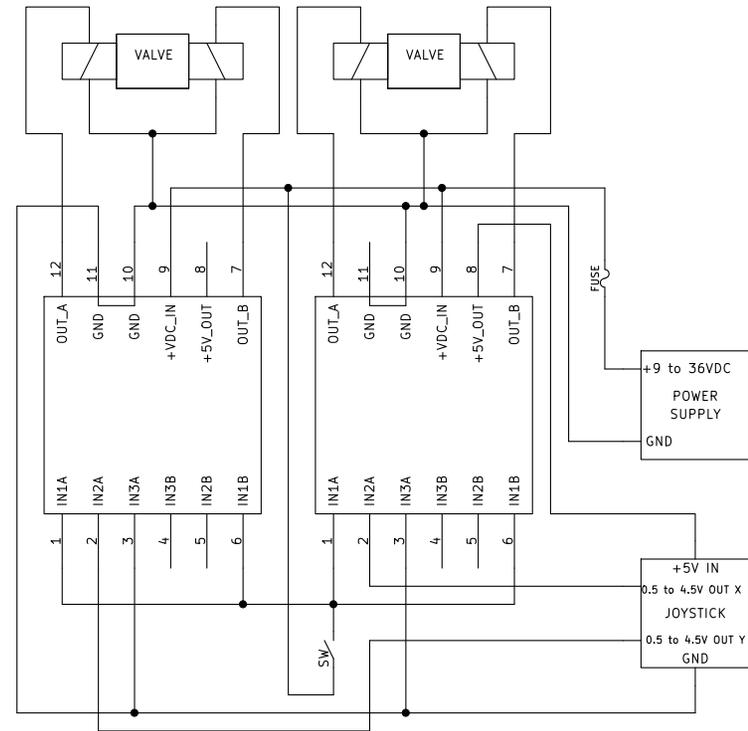
configuration and wiring diagram example 5.4 for

bipolar voice coil / servovalve:

potentiometer and ramp disable switch

IN2A Range	2.51	to	5.00	V
Solenoid A				
Input selection	IN A			
Output Range	0.01	to	3.00	A
Alternate Output Range	0.40	to	1.60	A
Ramp Up			0.0	s
Ramp Down			0.0	s
PWM Frequency			999.9	Hz
IN1A Function	Disable Ramps			
IN2A Range	0.00	to	2.49	V
Solenoid B				
Input selection	IN A			
Output Range	3.00	to	0.01	A
Alternate Output Range	1.60	to	0.40	A
Ramp Up			0.0	s
Ramp Down			0.0	s
PWM Frequency			999.9	Hz
IN1B Function	Disable Ramps			
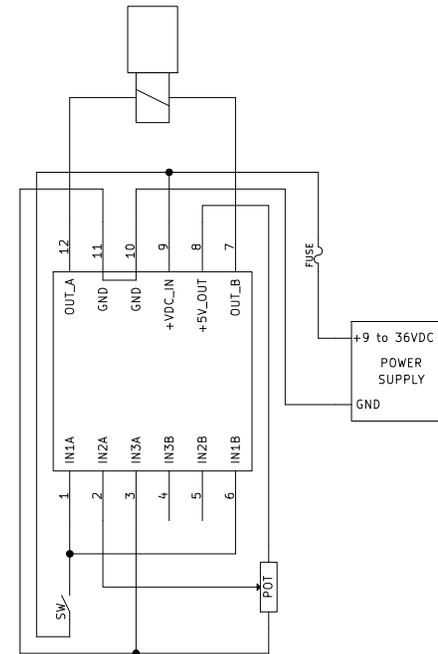
configuration and wiring diagram example 6.5 for

basic closed loop with single solenoid valve

potentiometer signal and 2-wire transmitter feedback

one enable switch

IN2A Range	0.01	to	4.99	V
Solenoid A				
Input selection	IN A – IN B			
Output Range	0.01	to	3.00	A
Alternate Output Range	0.40	to	1.60	A
Ramp Up			10.0	s
Ramp Down			10.0	s
PWM Frequency			220	Hz
IN1A Function	Enable Output			
IN1B Range	4.00	to	20.00	mA
Solenoid B				
Input selection	IN B – IN A			
Output Range	0.01	to	3.00	A
Alternate Output Range	2.50	to	3.50	A
Ramp Up			10.0	s
Ramp Down			10.0	s
PWM Frequency			220	Hz
IN2B Function	Unused			