

PDM-5 Instructions and setup

IDR Performance

WARNING: Use at your own risk. This device is not designed to be used in safety systems or other systems that may cause harm due to failure. Large amounts of power can flow from a battery and cause sparks or fires, a battery quick disconnect is recommended and keep a fire extinguisher nearby. To avoid causing harm, damage the unit or other devices connected to it, follow instructions carefully, check wiring and cover any loose or exposed wires before applying power.

MOUNTING: While in operation, this PDM Generates heat based on the load being switched. It is important to mount the PDM in a place that has cool airflow and away from hot components such as the exhaust or radiator. It is also recommended to have at least 1/2" gap behind the unit to have more airflow for 40 amps combined or more. Under a combined load of 40 amps this gap is not necessary and the PDM will not produce as much heat.

POWER: The PDM must be grounded before connecting to a battery or any power is applied. Battery Ground must be attached directly to the negative terminal of the battery or to a central grounding point for all devices. This connection carries more current so larger gauge wires and a secure connection is needed. The control ground is used for the internal controller and is for sensitive PWM signals. This can be attached to the battery ground or, for PWM; connect this ground close to your ECU/Controller.

The red 8mm Battery Positive post on the face of the unit should be connected directly to the positive terminal on the battery. This wire should be 4AWG to handle 80 amps and have an SC25-8 terminal. Keep this wire short so PWM switching is more efficient and less heat is generated. Tighten to 8ft-lbs then test and heat cycle, retighten after unit has cooled.

OUTPUTS: These wires will connect the PDM to the devices that will be controlled. It is important that each wire/pin does not exceed a maximum of 10 amps. For channels with a maximum higher than 10 amps, (CH4, CH5) two or three wires/pins from that channel can be connected together. 14AWG wire is the maximum size that can fit in the 24 pin connector and is recommended for 10 amps.

There is also one output that has a mechanical 1 amp fuse and is directly connected to the Battery Positive terminal. This output is always on and is used for small loads like power for the ignition switch or wireless key fob units.

INPUT: The Ignition input is used to turn the unit on or off. This should be a steady 5v-12v to keep the unit on and enable all channels. When power is applied to the ignition, the status light will turn red briefly and then stay solid green. When the PDM is switched on, there is a 1/2 second delay before the channels are enabled, no delay when the unit is turned off.

The Signal Input for each channel is used to switch on and off the load. They can be configured to be a positive voltage 3.3v-12v to switch it on (positive switching) or connected to ground to switch it on. (ground switching) Although the inputs are disabled when the ignition is off, they can draw small amounts of power with positive switching if the input remains on. This may drain the battery after long periods of time. It's best to wire any input switches to the ignition switch, so the inputs can only be turned on when the unit PDM is powered on. These inputs are very low current <10mA and thinner wire is recommended.

PWM INPUT: Each channel is PWM capable to control the power of the load on that channel. This can be used to regulate the brightness of a light or the speed of a fan. This PDM has a built in filter to remove any interference or weak signal and output a perfect square wave. The PDM can support 0-5KHz frequencies from 1%-99% duty cycle. Higher frequencies are less efficient and generate more heat therefore a sine wave or square wave input at 1KHz is recommended. To reduce interference and increase efficiency, it is recommended to use thinner shielded cables (with the shield grounded) that aren't near any high current wires or spark plug coils. The Control ground should be wired close to the ECU ground or PWM controller ground. Many ECUs are ground switching.

SENSOR OUTPUTS: The sensor outputs can be used for diagnostics or wired to a data logger for tuning. Each channel has a current sensor that will output 0-5v proportional to the current the load is using. ~2.5v for no load, above 2.5v the load is using current, below 2.5v the load is supplying current back to the vehicle's battery. (ex. small generator or charger) The sensor output measures instantaneous/peak current, when using PWM, it is recommended to use a 1uF capacitor from the sensor output to ground to measure average/RMS current.

The Temperature Sensor Output measures the case temperature and outputs a 0-5v signal. (Refer to voltage-temp graph on page 2) The sensor outputs are <15mA max and thinner wire is recommended.

CONNECTOR: The included 24 pin locking connector supports all connections apart from Battery Positive. There are 18 small pins and 6 large pins. The large pins will only fit into the holes towards the side of the connector. To make necessary connections, first strip 1/8" off the wire and insert it into the pin. Second, crimp or solder the wire so its securely attached to the pin. (SN-28B crimper) Next, remove the inner yellow retainer on the connector by prying at the side with a small screwdriver. Then remove the separator and rubber gasket from the back of the connector using the same method. Next push the wire and pin firmly into the desired hole, it should clip in and not be able to be pulled out. Also make sure the wires are fed through the gasket and separator as you go. Once all the wires are installed and everything has been tested, reinstall the yellow retainer, and slide the gasket with the separator up to the connector and clip it in.

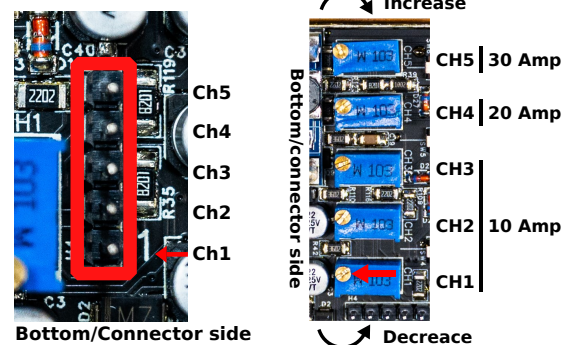
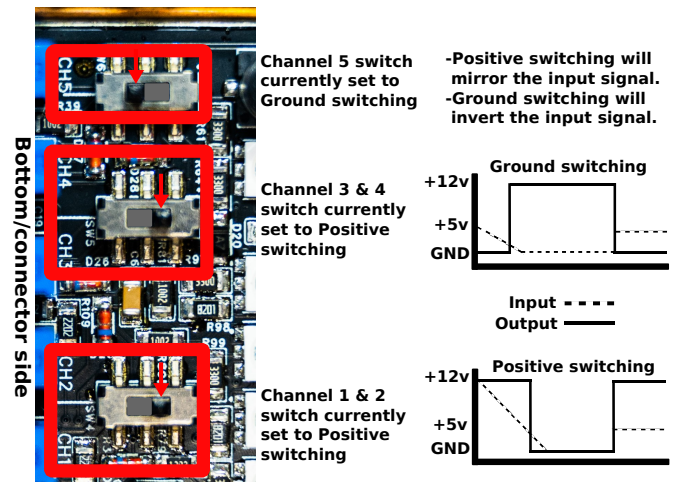
LIGHTS: The indicator LEDs display the status of the PDM and each channel. The STATUS LED will flash red and stay green when the Ignition input is turned on. STATUS-OFF: The ignition is off and the PDM is disabled. STATUS-RED: The PDM is too hot and the outputs are disabled. STATUS-GREEN: The PDM is on and operating normally.

CH#-OFF: That channel is off. CH#-GREEN: That channel is enabled and turned on.

CH#-RED: The fuse has been tripped on that channel and the output is disabled.

FUSES: The 12v Output is protected with a single-use 1 amp fuse and must be replaced when its blown with the spare included. (1808, 1A)

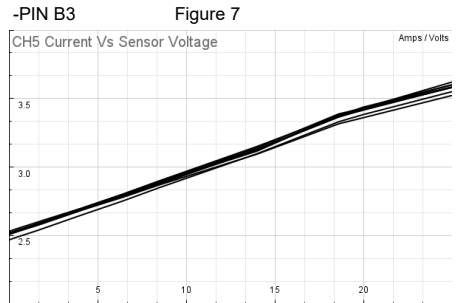
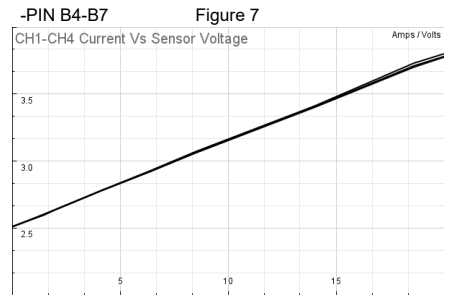
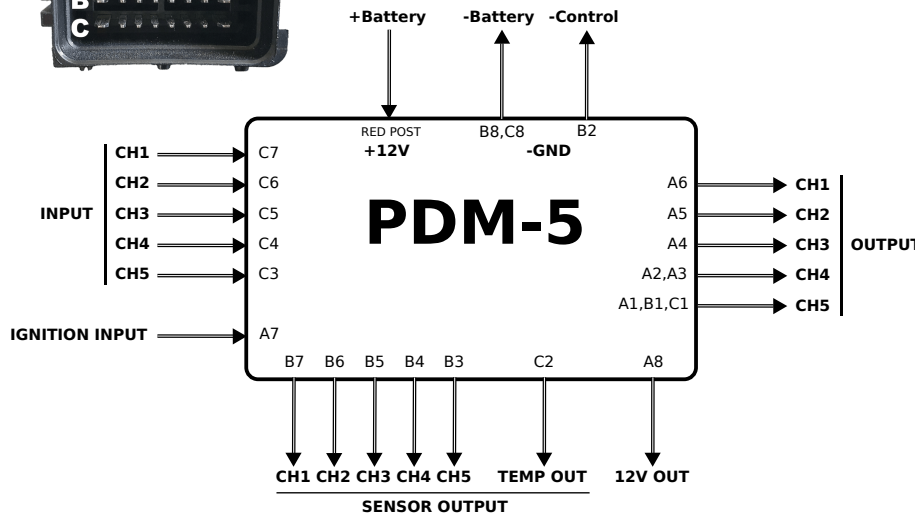
Each channel is protected with a solid state resettable fuse. The fuses are set to the rated current out of the box however they can be lowered to set the maximum current for each channel. To configure the fuse, open the PDM and connect a voltmeter to the desired pin on the header shown on the right and to ground. Turn the screw on the blue potentiometer to increase or decrease the voltage. Refer to the Voltage-Current chart on P2 to find the desired voltage to set the max current.



PDM-5 Analog Schematics and Pin Definition



Pin Diagram



Pin Definition

PIN	TYPE	@12v	@5v	CURRENT NAME	DESCRIPTION
A1	Output	6.6A	----	CH5 Output	One of the output pins for CH5, 6.6A per Pin for a total of 20A. Connect to the device you want to supply controlled power to.
A2	Output	8A	----	CH4 Output	One of the output pins for CH5, 8A per Pin for a total of 16A. Connect to the device you want to supply controlled power to.
A3	Output	8A	----	CH4 Output	One of the output pins for CH5, 8A per Pin for a total of 16A. Connect to the device you want to supply controlled power to.
A4	Output	8A	----	CH3 Output	Output pin for CH3, Connect to the device you want to supply controlled power to.
A5	Output	8A	----	CH2 Output	Output pin for CH2, Connect to the device you want to supply controlled power to.
A6	Output	8A	----	CH1 Output	Output pin for CH1, Connect to the device you want to supply controlled power to.
A7	Input	25mA	10mA	Ignition	Ignition (5v-12v) Input to turn the PDM ON, when its off the unit will not provide power or enable any outputs. (except A8, 12v Output)
A8	Output	1A	----	12v Output	A constant connection to Battery Positive with a mechanical 1A fuse, used for the Ignition.
B1	Output	6.6A	----	CH5 Output	One of the output pins for CH5, 6.6A per Pin for a total of 20A. Connect to the device you want to supply controlled power to.
B2	Output	1A	----	Control Ground	Ground connection for the PDM internal circuit. Connect close as possible to your controller ground. This ground connections is critical.
B3	Output	----	15mA	CH5 Sensor Output	Current sensor output for CH5, outputs an analog voltage based on how much current is flowing to that channel. No current= ~2.5v
B4	Output	----	15mA	CH4 Sensor Output	Current sensor output for CH4, outputs an analog voltage based on how much current is flowing to that channel. No current= ~2.5v
B5	Output	----	15mA	CH3 Sensor Output	Current sensor output for CH3, outputs an analog voltage based on how much current is flowing to that channel. No current= ~2.5v
B6	Output	----	15mA	CH2 Sensor Output	Current sensor output for CH2, outputs an analog voltage based on how much current is flowing to that channel. No current= ~2.5v
B7	Output	----	15mA	CH1 Sensor Output	Current sensor output for CH1, outputs an analog voltage based on how much current is flowing to that channel. No current= ~2.5v
B8	Output	10A	----	Battery Ground	Connect directly to the negative post of the battery. Primary use for inductor and DC Motor flyback.
C1	Output	6.6A	----	CH5 Output	One of the output pins for CH5, 6.6A per Pin for a total of 20A. Connect to the device you want to supply controlled power to.
C2	Output	----	15mA	Temp Sensor Output	Temperature sensor output for the PDM aluminum case, this temperature does not always reflect the circuit temperature.
C3	Input	7mA	3mA	CH5 Signal Input	Signal input for tuning on and off CH5, can be configured to High Logic or Low Logic input. 3.3v-12v tolerance, 5KHz 1%-99% PWM
C4	Input	7mA	3mA	CH4 Signal Input	Signal input for tuning on and off CH4, can be configured to High Logic or Low Logic input. 3.3v-12v tolerance, 5KHz 1%-99% PWM
C5	Input	7mA	3mA	CH3 Signal Input	Signal input for tuning on and off CH3, can be configured to High Logic or Low Logic input. 3.3v-12v tolerance, 5KHz 1%-99% PWM
C6	Input	7mA	3mA	CH2 Signal Input	Signal input for tuning on and off CH2, can be configured to High Logic or Low Logic input. 3.3v-12v tolerance, 5KHz 1%-99% PWM
C7	Input	7mA	3mA	CH1 Signal Input	Signal input for tuning on and off CH1, can be configured to High Logic or Low Logic input. 3.3v-12v tolerance, 5KHz 1%-99% PWM
C8	Output	10A	----	Battery Ground	Connect directly to the negative post of the battery. Primary use for inductor and DC Motor flyback.
RED POST	Input	60A	----	Battery Positive	Connect directly to the positive post of the battery. This supplies all the current for the PDM and its outputs. 4AWG wire recommended

Control ground and Battery grounds are vital to the operation of the unit. Unstable or poor ground connection will cause severe damage to the unit and safety features may be dissabled.

This is an example diagram for wiring the PDM-5 to an engine. This wiring schematic might not work for your setup or application.

