CARTEK
MOTORSPORT ELECTRONICS

POWER DISTRIBUTION MODULES

PDM-05 & PDM-4C

USER MANUAL **REV 1.0**

MOTORSPORT IS DANGEROUS.
THIS PRODUCT IS DESIGNED FOR MOTORSPORT USE ONLY AND SHOULD NOT BE USED ON ROAD/STREET VEHICLES OR ON PUBLIC HIGHWAYS.
NO WARRANTY IS MADE OR IMPLIED REGARDING ANY CARTEK PRODUCTS TO PROTECT USERS FROM INJURY OR DEATH.
USER ASSUMES ALL RISKS.

CONTENTS

INTRODUCTION

The **CARTEK PDM-4C** and **PDM-05** are small, 4 and 5 channel, electrical Power Distribution Modules (PDMs) that are specifically designed to replace relays, fuses and circuit-breakers thereby simplifying a vehicle's wiring system.
All outputs are fully protected against accidental short-circuits and over-current with user selectable current settings.
Outputs can be activated by the configurable input pins, or by receiving CAN messages (PDM-4C only).
Each channel has an Input and Output status LED with additional diagnostic data available through the CAN data stream.
All configuration is done through the integrated push button so no external software is required.

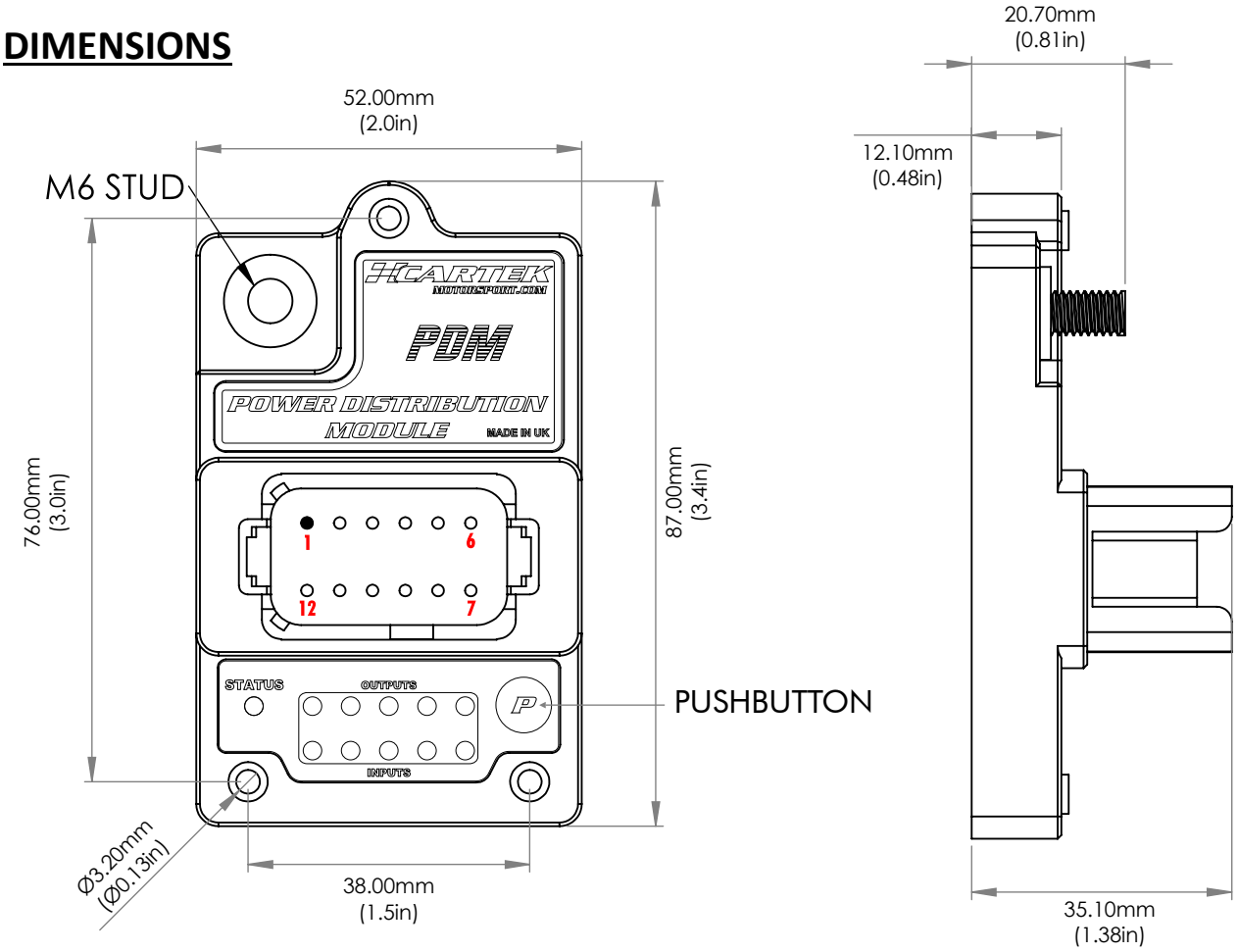
GENERAL SPECIFICATION

Size:	L = 87mm (3.4in), W = 52mm (2.0in)
Weight:	128g (0.28lbs)
Battery Positive terminal:	M6 stud
12 pin Connector:	TE/Amphenol DT06-12SB
Operational Voltage:	8v - 18v
Current consumption:	60-200mA typ.
Output current limits:	Selectable 5/10/15/20A current limits. Soft-Start available on each output.
Total current output	60A(PDM-4C) / 70A(PDM-5)
Input Types	4 x Input types: (Active low/Active High/Edge Triggered/PWM control)
CAN Bus	125/250/500/1000 kbps selectable baudrates. Selectable Input and Output stream addresses.
Operating temperature:	-25°C - +100°C
Storage temperature:	-40°C - +125°C

PDM COMPARISON TABLE

	CK-PDM-4C	**CK-PDM-05**
No. of Outputs:	4 x 20A outputs	5 x 20A outputs
Maximum total current:	60A	70A
No. Of Inputs:	4	5
CAN-Bus enabled:	Yes	No
Additional Lighting Functions:	No	Yes

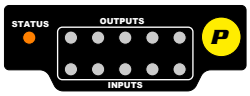
DIMENSIONS



PIN OUT

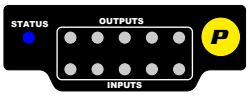
Pin Number	CK-PDM-4C	CK-PDM-05
1	Ground	Ground
2	CH1 Output	CH1 Output
3	CH2 Output	CH2 Output
4	CH3 Output	CH3 Output
5	CH4 Output	CH4 Output
6	CAN-Lo	CH5 Output
7	CAN-Hi	CH5 Input
8	CH4 Input	CH4 Input
9	CH3 Input	CH3 Input
10	CH2 Input	CH2 Input
11	CH1 Input	CH1 Input
12	Aux Input	Aux Input

OVERALL STATUS LED



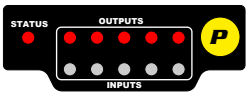
Status LED is Orange:

Power is applied but Ignition Input is OFF. All outputs will remain OFF.



Status LED is Blue:

Power is applied and Ignition Input is ON. All outputs can be activated.

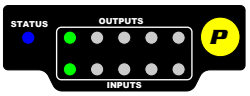


Status LED is flashing Red:

All Outputs have shutdown due to major error. See 'Fault Diagnostic' page for more information.

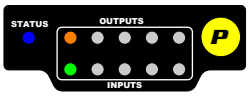
Status	LED Colour
PDM powered / Ignition input OFF.	Orange
PDM powered / Ignition input ON.	Blue
Low-Voltage detected (<8V)	Red (2-Flashes)
High Voltage detected (>18V)	Red (3-Flashes)
Over Temperature limit (>85°C)	Red (4-Flashes)
Maximum total current exceeded.	Red (5-Flashes)

INPUT/OUTPUT STATUS LED



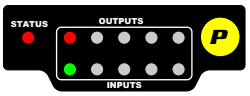
Channel 1 Input is active.

Channel 1 Output is ON.



Channel 1 Input is active.

Channel 1 output current is too high.

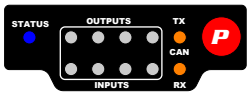


Channel 1 Input is active.

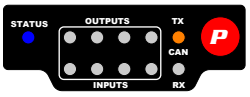
Channel 1 Output has shutdown due to Over-Current.

Status	LED Colour
Input/Output is Active	Green
Output is in Over-current phase	Amber
Output Shutdown	Red (flashing)

CAN-BUS STATUS LED (PDM-4C only)

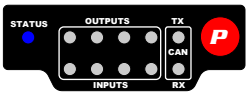


CAN Bus data is being transmitted and received.



CAN Bus data is being transmitted.

No CAN Bus data is being received.



No CAN Bus data is being transmitted or received. Possible connection error or baudrate mismatch.

Status	LED Colour
CAN Receive (RX) is Active	Amber
CAN Transmit (TX) is Active	Amber
No CAN Activity	Off

ERROR RESET

If an over-current error occurs on a channel then this error can be reset by simply turning that channel OFF then ON again via the Input pin or CAN Message. This error can also be reset by pressing Pushbutton 'P' or by turning Ignition Input OFF.

If a major error occurs then this can only be reset by turning all channels OFF, by pressing Pushbutton 'P', by turning Ignition Input OFF or sending CAN Bus reset message.

OVER-CURRENT PROTECTION

Each output on the Power Distribution Module has 8 available settings for over-current protection:

Setting	Current Limit	Setting	Current Limit
1	5 Amps	5	15 Amps
2	5 Amps with Soft Start	6	15 Amps with Soft Start
3	10 Amps	7	20 Amps
4	10 Amps with Soft Start	8	20 Amps with Soft Start

The Power Distribution Module will constantly monitor the current of each output while it is ON.

- If the output current is greater than 15% of the selected setting then the output will shut down. The Output Status LED (and CAN diagnostic data) will indicate that the output has shut down.
- If the output current is greater than the selected setting but under the 15% threshold then the output will remain on for a limited period of time (the higher the exceeded amperage, the quicker the shutdown). Therefore each output can accept moderate current spikes and inrush current. The Output Status LED (and CAN diagnostic data) will indicate when it is in the over-current phase. This provides users with an early warning if the current flowing through an output is close to the exceeded current (as set in the configuration).
- If the total current from all active channels exceeds 60 Amps then all outputs will shut down.

SOFT-START

If the connected load draws too much current at start up and causes the output to shut down then it is recommended to use the Soft Start settings. This feature will slowly turn on the load therefore reducing any inrush current it may have. Soft Start should be used for any inductive loads such as radiator fan, electric motor, electric pump, or xenon lights.

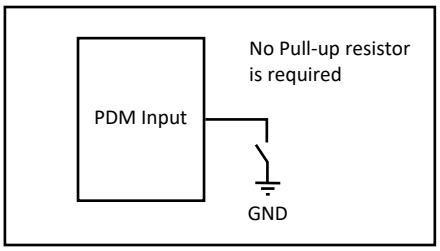
Note: Soft Start does not operate when Input Type is set to PWM.

INPUT TYPES

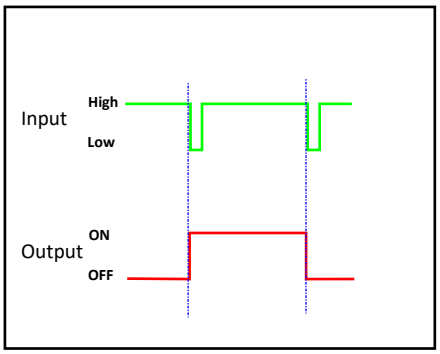
Each Input on the Power Distribution Module has 6 available options:

Setting	Input Type	Setting	Input Type
1	Active Low (default)	4	Active High
2	Edge Trigger (Without Memory)	5	Always On
3	Edge Trigger (With Memory)	6	PWM Input

1) Active LOW (default) GROUND SWITCHED SIGNAL
The channel output will be **ON** whenever the Input Signal is at a **low** level (less than 1.2V). When the input is left open-circuit the output will be **OFF**.
Note: A pull-**up** resistor is internally connected to each input pin.

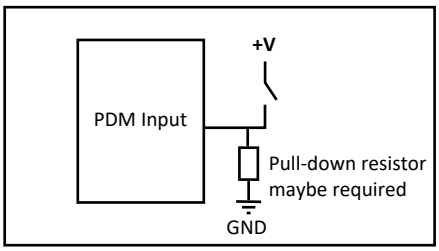


2) Edge Trigger (Without Memory). **GROUND SWITCHED SIGNAL**
The channel output will switch **ON** only when the Input Signal voltage falls from a high level to a low level and will switch **OFF** only on the next occurrence of a falling signal. This is for use with momentary pushbutton switch inputs where the output will 'latch' ON and OFF.
Note: A pull-**up** resistor is internally connected to each input pin.



3) Edge Trigger (WITH Memory). **GROUND SWITCHED SIGNAL**
Same as above (4) but the status of the output is saved to memory such that on power-up the Output will always return to the previous ON or OFF state.
Note: A pull-**up** resistor is internally connected to each input pin.

4) Active HIGH. **POSITIVE SWITCHED SIGNAL**
The channel output will be **ON** whenever the Input Signal is at a **high** level (higher than 1.2V). When the input is left open-circuit the output will be **ON**.
Note: If the output is required to be **OFF** when the input is left open-circuit then a pull-**down** resistor needs to be installed between the channel input pin and chassis/ground. This resistor value will need to be between 1Kohms and 3.3Kohms.



5) Always ON.
The channel output will be permanently **ON** except when the Ignition Input is OFF or when there is an over-current error. No input connection is required. An over-current error can be reset by pressing Pushbutton 'P', by turning Ignition Input OFF or sending CAN Bus reset message.

6) PWM Input/Output.
The Output will directly follow the Input without any filtering or switch debounce. This can be used for PWM input signals at maximum frequency of 200hz. **Note:** To manage heat build up it is recommended to drive the input at 100hz maximum and output current of 15A maximum if using for a long period of time.

CAN Inputs (PDM-4C only)

Channels can also be activated by receiving a CAN message. The Input type must be set to Active Low or Edge trigger.
For more information go to the CAN-Bus chapter.

OUTPUT FUNCTIONS

Each output on the Power Distribution Module has 6 available functions:

Setting	Function	Setting	Function
1	Input Controlled (default)	4	Timer ON (10 Mins)
2	Flashing (1Hz)	5	Overrun (5 Mins)
3	Timer ON (5 Mins)	6	Overrun (10 Mins)

1) Input Controlled (default) The channel output will switch ON and OFF according to the status of the Input.

2) Flashing (1Hz). When the channel output is switched ON it will flash at a rate of 1Hz.
Example use: Direction /indicators.

3) Timer On (5 Minutes). The channel output will switch ON and OFF according to the status of the Input but will only remain on for a maximum time of 5 minutes. Example use: Heated Screen

4) Timer On (10 Minutes). The channel output will switch ON and OFF according to the status of the Input but will only remain on for a maximum time of 10 minutes. Example use: Heated Screen

5) Overrun (5 Minutes). The channel output will switch ON and OFF according to the status of the Input but will remain on, after being switched off, for an additional 5 minutes. Example use: Radiator Fan.

6) Overrun (10 Minutes). The channel output will switch ON and OFF according to the status of the Input but will remain on, after being switched off, for an additional 10 minutes. Example use: Radiator Fan.

AUXILIARY INPUT MODES

The Power Distribution Modules have a dedicated Auxiliary Input pin (AUX) that offers the following functions:

Setting	Mode	Setting	Mode
1	No Function	4	Hazard Indicator Flashing
2	Ignition Input (High)	5	Car Lights Controller **(CK-PDM-05 only)**
3	Ignition Input (Low)	6	Spot Lamps Controller **(CK-PDM-05 only)**

1 = No Function. The AUX Input is disabled.

2 = Ignition Input - High. Outputs will be active only when the voltage on AUX Input pin is at a high level (greater than 3.0V). All outputs are shutdown while the AUX Input is at a low level (lower than 2.0V) or unconnected. A pull-**down** resistor is internally connected to the AUX Input pin with this function.
Note: With this configuration the AUX Input could be connected to +12V Ignition Switch.

3 = Ignition Input - Low (Default) All outputs are shutdown while the AUX Input is at a low level (lower than 2.0V). Outputs will only become active when the AUX Input is at a high level (greater than 3.0V) or unconnected. A pull-**up** resistor is internally connected to the AUX Input pin with this function.
Note: With this configuration the AUX Input can be connected to ground-switched Ignition OFF signal, e.g. Battery Isolator.

Note: The Engine Stop output signals from CARTEK Battery Isolators will work with either Ignition Input setting.

4 = Hazard Indicator Flashing. Any channels that are set to Flashing(1Hz) (see Menu 3) will automatically flash when the AUX Input is connected to 0V (chassis/ground). A pull-**up** resistor is internally connected to the AUX Input pin with this function.
Note: With this configuration the AUX Input can be used as a Hazard Indicator switch input by operating any channels that are set to Turn Signal Indicators (Flashing 1Hz).

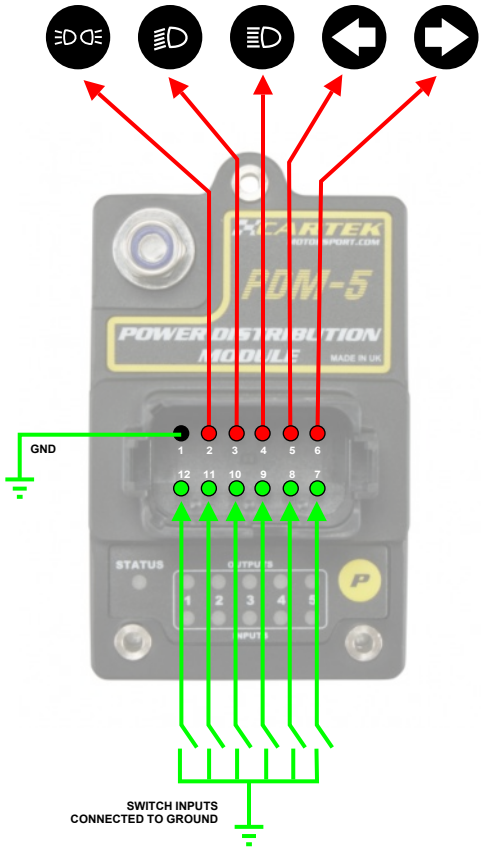
SPECIFIC CONTROLLER APPLICATIONS **(PDM-05 ONLY)**

When the Auxiliary Input pin is configured for Setting 5 or 6 (see Menu 4) then the Power Distribution Module becomes a specific controller where the Inputs and Outputs are specifically assigned with specific functionality. Output Current Protection and Input Types can still be configured.

Note: This only applies to the **PDM-05** and not the **PDM-4C**

CAR LIGHTS CONTROLLER (PDM-05 only)

When the AUX Input is set to Car Lights Controller (Menu 4, option 5) the Inputs and Outputs are automatically allocated for the purpose of controlling 5 lighting circuits:



Pin Number	Description
1	Ground
2	Side/Tail/Rain Light Output
3	Low Beam Output
4	High Beam Output
5	Left Indicator Output
6	Right Indicator Output
7	Right Indicator Input
8	Left Indicator Input
9	High Beam Input
10	Low Beam Input
11	Side/Tail/Rain Light Input
12	Hazard Indicator Input

NOTES FOR OPERATION:

Inputs must **only** be connected to ground and set to either:

1. Active Low - if using a 'latching' switch.
2. Edge Trigger (Without Memory) - if using a 'momentary' switch.
3. Edge Trigger (WITH Memory) - if using a 'momentary' switch.

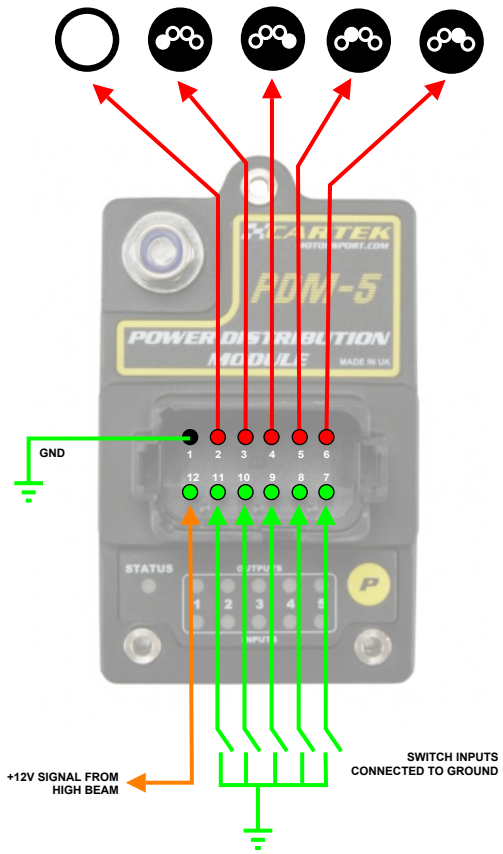
Pin 2 output (Side/Tail/Rain Lights) will turn ON when pin 11 input is active but will also automatically turn ON when either Low Beam or High Beam outputs are ON.

Low Beam will automatically turn OFF when High Beam is turned ON.

When Pin 12 is active (Hazard Indicator Input) both Indicator outputs will be active .

SPOT LIGHTS CONTROLLER (PDM-05 only)

When the AUX Input is set to Spot Lights Controller (Menu 4, option 6) the Inputs and Outputs are automatically allocated for the purpose of controlling Spot Lamps:



Pin Number	Description
1	Ground
2	'Spare' Output
3	Spot Light 1 Output
4	Spot Light 2 Output
5	Spot Light 3 Output
6	Spot Light 4 Output
7	Spot Light 'Flash' Input
8	Spot Light 'ALL' Input
9	Spot Light 3 & 4 Input
10	Spot Light 1 & 2 Input
11	'Spare' Input
12	Spot Light Enable Input (+12V)

NOTES FOR OPERATION:

Spot Light outputs only active when a +12V signal is applied to the Spot Light Enable input, pin 12. By connecting this to a headlamp high-beam circuit the spot lamp outputs will automatically extinguish when headlamps are dipped to low-beam.

Spot Light Flash Input must **only** be connected to a momentary action, ground connected pushbutton switch.

Input pins 8-11 must **only** be connected to ground connected switches and set to either:

1. Active Low - if using a 'latching' switch.
2. Edge Trigger (Without Memory) - if using a 'momentary' switch.
3. Edge Trigger (WITH Memory) - if using a 'momentary' switch.

The 'Spare' Output will work independently of the Spot Lights and so will not turn off if the Spot Light Enable Input is switched off. Therefore, this can be used for any purpose such as Navigator Light or Rain Light.

INSTALLATION

The PDM should be mounted in a cool area of the vehicle and secured in place using all three mounting holes. The PDM is designed to withstand a high degree of shock and vibration so it can be mounted direct to chassis without the need to use vibration absorbing rubber mounts.

BATTERY POSITIVE CONNECTION

Power to the PDM is via the M6 electrical stud base. This should be connected directly to the positive terminal of the car battery using cable that is capable of handling the maximum total output current when all channels are activated.

MAIN CONNECTOR

All other connections are via the 12pin Amphenol AT04-12PX connector. To connect to this, use the AT06-12SB housing and AT62-201 crimps supplied. The crimps are suited for 20-16 AWG wire only and can handle 20 Amps continuously at 60 degrees or less. The higher the temperature the less current the crimps can handle (manufacture specifies 13 Amps at 125 degrees). Wire size must be compatible with the crimps and capable of handling the maximum output current.
NOTE: When attaching the crimps onto the wires, always use the crimp manufacturer specific tool.

GROUND CONNECTION

Pin(1) must be connected to chassis/GND at all times. 16 AWG wire is recommended.
NOTE: If you are driving an output through PWM then you should make sure the connected load also shares the same ground connection as the PDM.

INPUT CONNECTIONS

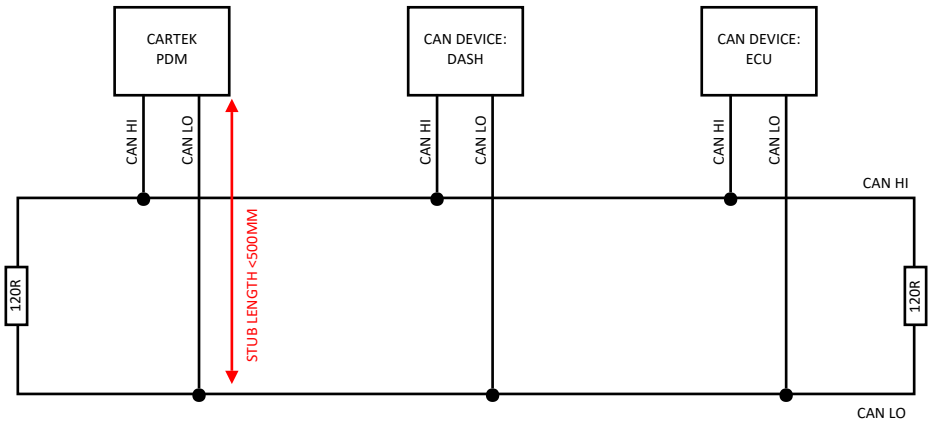
The inputs are only low current signals therefore 20 AWG wire can used.

OUTPUT CONNECTIONS

The output current will dictate the wire gauge used. Typically with high quality wire (TYCO spec 55):
5-10 Amps = 20AWG
15-20 Amps = 16AWG

CAN BUS WIRING

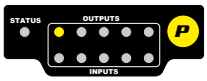
The CAN-Bus should consist of two wires twisted together (0.5-1 twist per cm), with 120R terminating resistors at each end of the bus. The PDM does not have an internal terminating resistor. The maximum length of the bus is 16 meters and maximum 'stub' length is 500mm.



CONFIGURATION

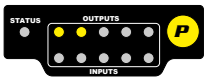
To enter Configuration Mode, press and hold the pushbutton '**P**' for 2 seconds. After this time, the user can select any one of five menus by observing the Yellow LEDs and releasing the pushbutton when the required menu is displayed. Configuration Mode can be exited by pressing and holding the pushbutton until all LEDs display Purple or by simply removing power from the device.

Menu 1 - 1 LED



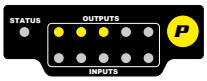
Current Protection

Menu 2 - 2 LEDs



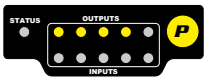
Input Type

Menu 3 - 3 LEDs



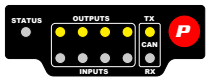
Output Function

Menu 4 - 4 LEDs



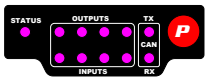
Aux Input Type

Menu 5 - 5 LEDs



CAN-Bus Configuration (CK-PDM-04C only)

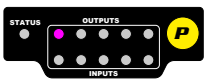
Menu Exit



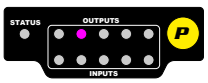
CURRENT PROTECTION (MENU 1)

On selecting Menu 1 the user should now select the required Channel by pressing and holding the pushbutton again and observing the LEDs:

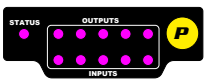
Output 1



Output 2



Menu Exit



When the LED of the required channel is lit then the pushbutton should be released. This LED will now flash to indicate the stored setting and subsequent presses will adjust and save the new setting.
There are 8 options:

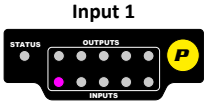
LED Pattern	Nominal current Limit	LED Pattern	Nominal current Limit
1 Flash	5 Amps	5 Flashes	15 Amps
2 Flashes	5 Amps with Soft Start	6 Flashes	15 Amps with Soft Start
3 Flashes	10 Amps (Default)	7 Flashes	20 Amps
4 Flashes	10 Amps with Soft Start	8 Flashes	20 Amps with Soft Start

When you have completed adjusting the setting for the channel press and hold down the pushbutton to scroll to the next channel, or keep pressing until all LEDs display purple to exit configuration.

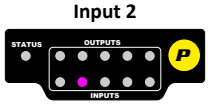
INPUT TYPE (MENU 2)

On selecting Menu 2 the user should now select the required Channel by pressing and holding the pushbutton again and observing the LEDs:

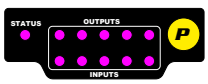
Input 1



Input 2



Menu Exit



When the LED of the required channel is lit then the pushbutton should be released. This LED will now flash to indicate the stored setting and subsequent presses will adjust and save the new setting.
There are 6 options:

LED Pattern	Input Type	LED Pattern	Input Type
1 Flash	Active Low (Default)	4 Flashes	Active High
2 Flashes	Edge Trigger (without memory)	5 Flashes	Always On
3 Flashes	Edge Trigger (with memory)	6 Flashes	PWM driven

When you have completed adjusting the setting for the channel press and hold down the pushbutton to scroll to the next channel, or keep pressing until all LEDs display purple to exit configuration.

OUTPUT FUNCTION (MENU 3)

On selecting Menu 3 the user should now select the required Channel by pressing and holding the pushbutton again and observing the LEDs:

When the LED of the required channel is lit then the pushbutton should be released. This LED will now flash to indicate the stored setting and subsequent presses will adjust and save the new setting.
There are 6 options:

LED Pattern	Output Function	LED Pattern	Output Function
1 Flash	Input driven (Default)	4 Flashes	Timer On (10 mins)
2 Flashes	Flashing (1Hz)	5 Flashes	Over-run (5 mins)
3 Flashes	Timer On (5 mins)	6 Flashes	Over-run (10 mins)

When you have completed adjusting the setting for the channel press and hold down the pushbutton to scroll to the next channel, or keep pressing until all LEDs display purple to exit configuration.

AUX INPUT TYPE (MENU 4)

On selecting Menu 4 the main STATUS LED will now flash to indicate the stored function and subsequent presses will adjust and save the new function .

There are 6 options:

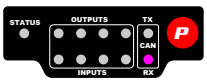
LED Pattern	Input Type	LED Pattern	Input Type
1 Flash	No Function	4 Flashes	Hazard Indicator Input
2 Flashes	Ignition Input (High)	5 Flashes	Car Lights Controller **(PDM-5 only)**
3 Flashes	Ignition Input (Low) Default	6 Flashes	Spot Lamps Controller **(PDM-5 only)**

When you have completed adjusting the setting for the channel press and hold down the pushbutton until all LEDs display purple to exit configuration.

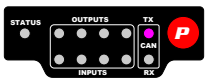
CAN BUS CONFIGURATION (MENU 5)

On selecting Menu 5 you will now go into a 'Sub menu' where there are 3 settings to choose from

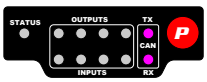
CAN RX Base ID



CAN TX Base ID



CAN Baud Rate



CAN BUS RECEIVE BASE ID

The RX LED will flash first indicating the Base ID setting for CAN Receive. Subsequent presses will adjust the setting. There are 6 Base ID options:

LED Pattern	CAN Receive Base ID	LED Pattern	CAN Receive Base ID
1 Flash	0x030 (Default)	4 Flashes	0x360
2 Flashes	0x140	5 Flashes	0x470
3 Flashes	0x250	6 Flashes	0x580

When you have completed adjusting the setting for the CAN Receive Base ID press and hold down the pushbutton to scroll to the next CAN setting or keep pressing until all LEDs display purple to exit configuration.

CAN BUS TRANSMIT BASE ID

The TX LED will flash indicating the Base ID setting for CAN Transmit. Subsequent presses will adjust the setting. There are 7 Base ID options:

LED Pattern	CAN Transmit Base ID	LED Pattern	CAN Transmit Base ID
1 Flash	0x038 (Default)	5 Flashes	0x478
2 Flashes	0x148	6 Flashes	0x588
3 Flashes	0x258	7 Flashes	No Data Transmissions
4 Flashes	0x368		

When you have completed adjusting the setting for the CAN Receive Base ID press and hold down the pushbutton to scroll to the next CAN setting or keep pressing until all LEDs display purple to exit configuration.

CAN BUS BAUD RATE

The TX LED and RX LED will flash indicating the CAN Baud Rate setting. Subsequent presses will adjust the setting. There are 4 options:

LED Pattern	CAN Baud Rate	LED Pattern	CAN Receive Base ID
1 Flash	125KB/s	3 Flashes	500KB/s
2 Flashes	250KB/s	4 Flashes	1 MB/s (Default)

When you have completed adjusting the setting for the CAN Receive Base ID press and hold down the pushbutton until all LEDs display purple to exit configuration.

CAN MESSAGING (RECEIVE)

To control the PDM through CAN you must send a message in this format:

ID	DLC	BYTE 0	BYTE 1	BYTE 2	BYTE 3	BYTE 4	BYTE 5	BYTE 6	BYTE 7
Base ID	4	CH1 control	CH2 control	CH3 control	CH4 Control				
Base ID+2	2	Trip Reset	Power Cycle						

Channels can be activated through CAN when you send a message in the above format. The channels will turn on when the PDM receives a data byte with a value greater than 00.

Example:
Channels 1 + 4 to be activated:

ID	DLC	BYTE 0	BYTE 1	BYTE 2	BYTE 3	BYTE 4	BYTE 5	BYTE 6	BYTE 7
0x030	4	01	00	00	01				

You can also send a CAN message to the PDM to reset any tripped outputs or to perform a Power cycle on Base ID+2

Example:
Trip Reset:

ID	DLC	BYTE 0	BYTE 1	BYTE 2	BYTE 3	BYTE 4	BYTE 5	BYTE 6	BYTE 7
0x032	2	01	00						

Note: If you have more than one CARTEK PDM-04C on the CAN line then you must make sure that each one has a different Base ID set for CAN receive and CAN transmit.

CAN MESSAGING (TRANSMIT)

The PDM will output these CAN messages:

ID	DLC	BYTE 0	BYTE 1	BYTE 2	BYTE 3	BYTE 4	BYTE 5	BYTE 6	BYTE 7
Base ID	4	CH1 Amp Setting	CH2 Amp Setting	CH3 Amp Setting	CH4 Amp Setting				
Base ID+1	4	CH1 Input Setting	CH2 Input Setting	CH3 Input Setting	CH4 Input Setting				
Base ID+2	4	CH1 Function Setting	CH2 Function Setting	CH3 Function Setting	CH4 Function Setting				
Base ID+3	4	CH1 Input Status	CH2 Input Status	CH3 Input Status	CH4 Input Status				
Base ID+4	4	CH1 Output Status	CH2 Output Status	CH3 Output Status	CH4 Output Status				
Base ID+5	4	CH1 Input Signal Voltage	CH2 Input Signal Voltage	CH3 Input Signal Voltage	CH4 Input Signal Voltage				
Base ID+6	4	CH1 Output Current	CH2 Output Current	CH3 Output Current	CH4 Output Current				
Base ID+7	8	Total Output Current	Battery Voltage	Internal Temperature	Aux Input Voltage	Aux Function Setting			Error Flag Status

CAN DATA FORMAT

The PDM will output these CAN messages:

Name	Type	Byteorder	Length	Multiplier	Offset	Data
CH() Amp Setting	Unsigned	Motorola	1	1	0	AMP Setting: 1-8 (as set by Configuration Menu 1)
CH() Input Setting	Unsigned	Motorola	1	1	0	INPUT Setting: 1-6 (as set by Configuration Menu 2)
CH() Function Setting	Unsigned	Motorola	1	1	0	FUNCTION Setting: 1-6 (as set by Configuration Menu 3)
CH() Input Status	Unsigned	Motorola	1	1	0	**0**=Inactive, **1**=Active
CH() Output Status	Unsigned	Motorola	1	1	0	**0**=Inactive, **1**=Active, **2**=High-Current, **3**=Over-Current Error.
CH() Input Signal Voltage	Unsigned	Motorola	1	1	0	Value = Volts e.g. 49 (0x31) = 4.9V
CH() Output Current	Unsigned	Motorola	1	1	0	Value = AMPs e.g. 12 (0x0Ch) = 12A
Total Output Current	Unsigned	Motorola	1	1	0	Value = AMPs e.g. 12 (0x0Ch) = 12A
Battery Voltage	Unsigned	Motorola	1	1	0	Value = Volts e.g. 49 (0x31) = 4.9V
Internal Temperature	Unsigned	Motorola	1	1	0	Value = °C (e.g. 20 = 20°C)
Aux Input Voltage	Unsigned	Motorola	1	1	0	Value = Volts e.g. 49 (0x31) = 4.9V
Aux Mode Setting	Unsigned	Motorola	1	1	0	Aux Mode Setting: 1-6 (As set by Configuration Menu 3)
Error Flag Status	Unsigned	Motorola	1	1	0	**1** (0x01h) = Battery Voltage is too Low. **2** (0x02h) = Battery Voltage is too High. **3** (0x04h) = Temperature is too High. **4** (0x08h) = Total output current is too High. **5** (0x10h) = Any individual output current is too High. **6** (0x20h) = Ignition input is OFF.

A DBC File with all the CAN Transmit information can be downloaded at **www.cartekmotorsport.com/downloads**

FACTORY RESET

The pushbutton can be pressed at anytime to reset any over-current errors.
The pushbutton can also be used to reset all configurations back to factory/default settings. This is done by firstly disconnecting power, then pressing and holding the pushbutton while power is then re-applied. Keep pressing the pushbutton until the LEDs all display Blue, then release the pushbutton.

The factory/default settings are:

Current Protection on all channels: 10A (Setting **3**).
Input Type on all channels: Active Low (Setting **2**).
Function on all channels: Input Driven (Setting **1**).
AUX input: Ignition Input (Low) (Setting **3**).

PDM-4C only:
CAN Receive Base ID: 0x030 (Setting 1)
CAN Transmit Base ID: 0x038 (Setting 1)
CAN Baudrate: 1Mb/s (Setting 4)