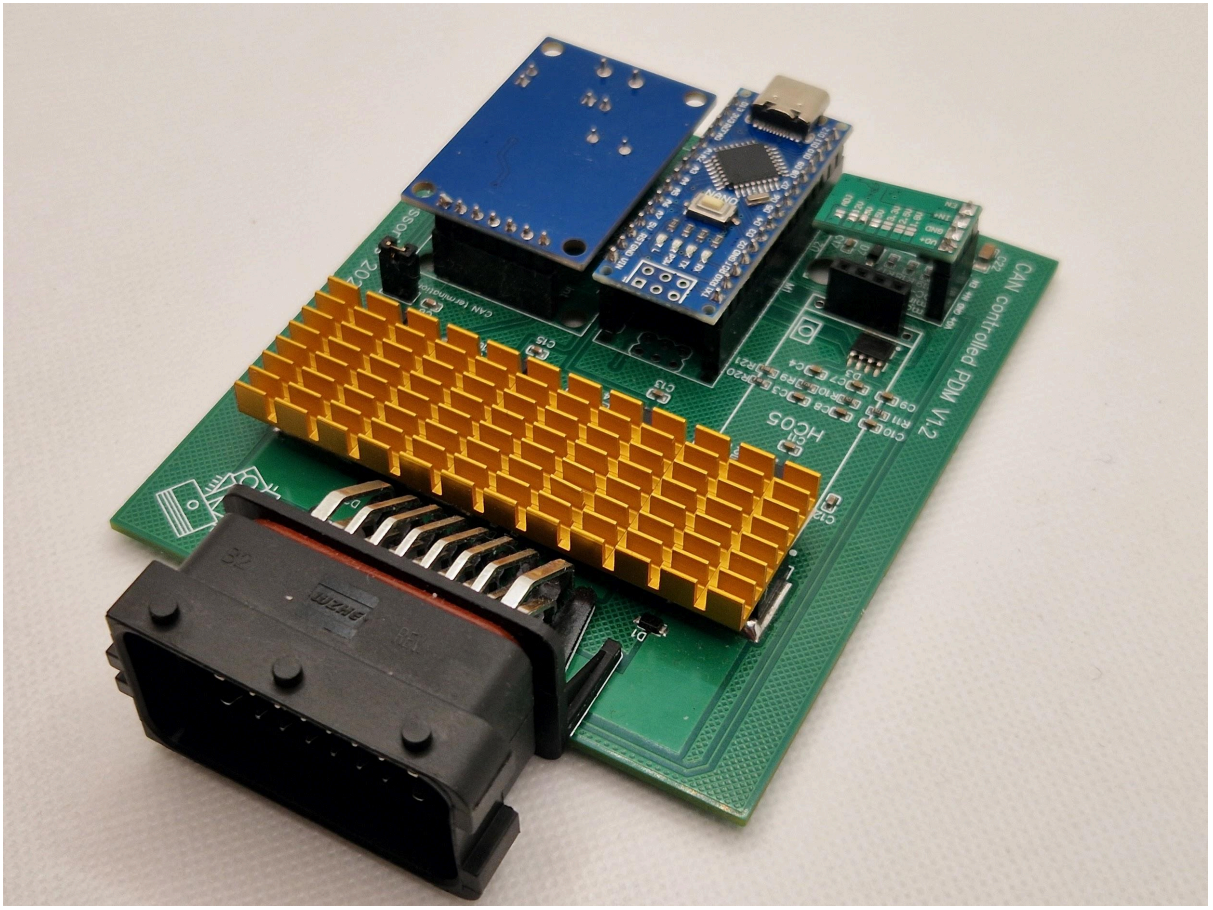
Manual for CAN-Controlled 4-Channel Power Distribution Module



EngineElectronicAccessories - 2025

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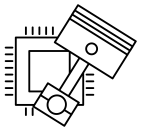
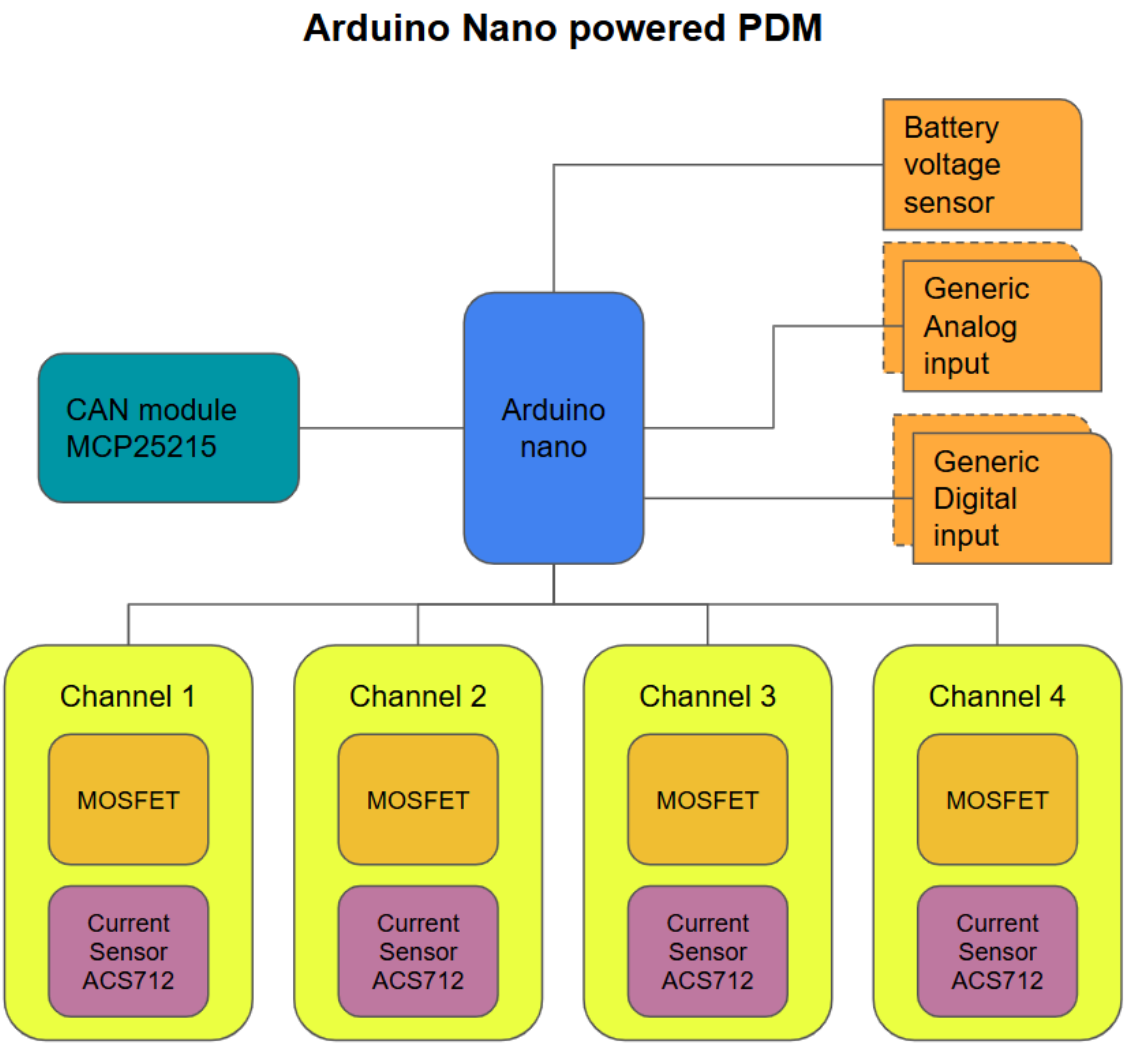


Introduction

The CAN-Controlled Power Distribution Module (PDM) is an open-source, Arduino-compatible device designed for automotive, industrial, and automation applications. This manual provides installation, configuration, and usage guidelines to ensure optimal performance and integration with your system

Features & Specifications



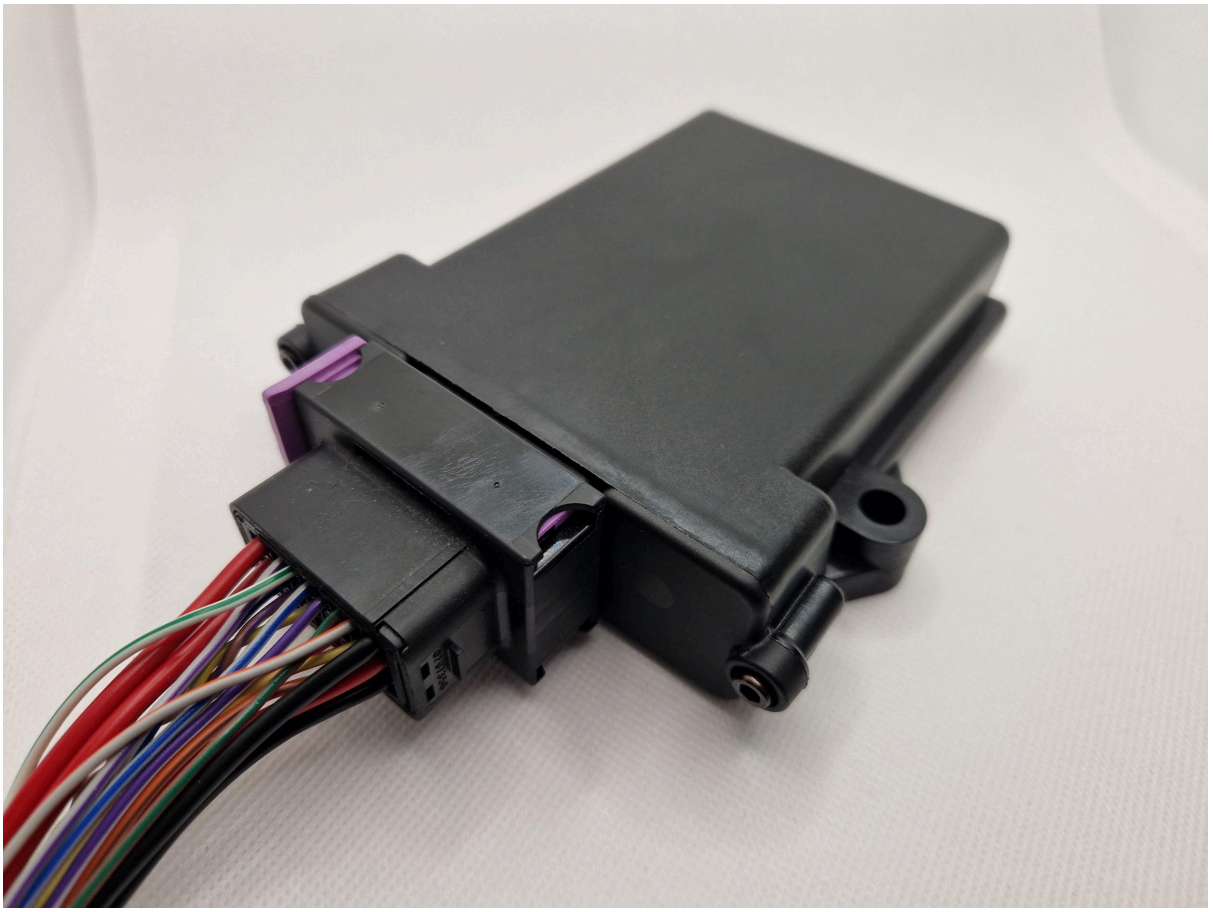
Key Features

- 4 High-Side Outputs (6A per Channel)
- Current Measurement on Each Channel
- 3 Analog Inputs (0-5V) for Sensors
- 2 Digital Inputs for Switches
- CAN Bus Communication for High-Speed Integration
- Arduino-Compatible for Customization
- Open-Source Hardware & Software
- Selectable CAN Termination via Pin-Header Jumper

Technical Specifications

- **Input Voltage:** DC 7V - 24V
- **Channel Current:** Up to 6A per output
- **CAN Bus Baud Rate:** Default 500 kbit/s (adjustable in software)
- **Power Consumption:** 0.25 W (20mA @ 12VDC)
- **Connector:** 24P FCI
- **Enclosure Dimensions:** 140x120x35mm
- **Microcontroller:** Arduino Nano

Installation & Wiring



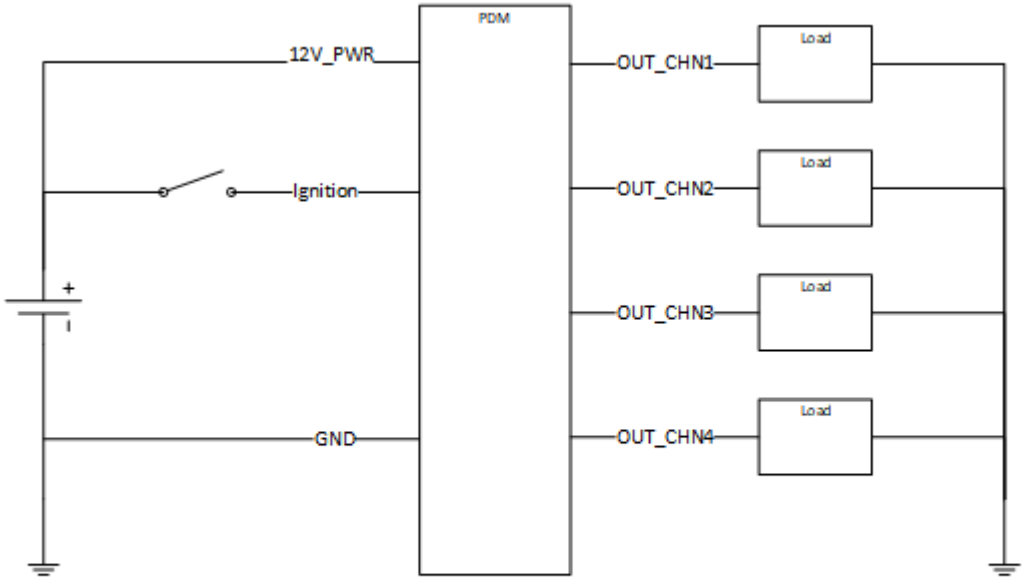
Power Supply Connection

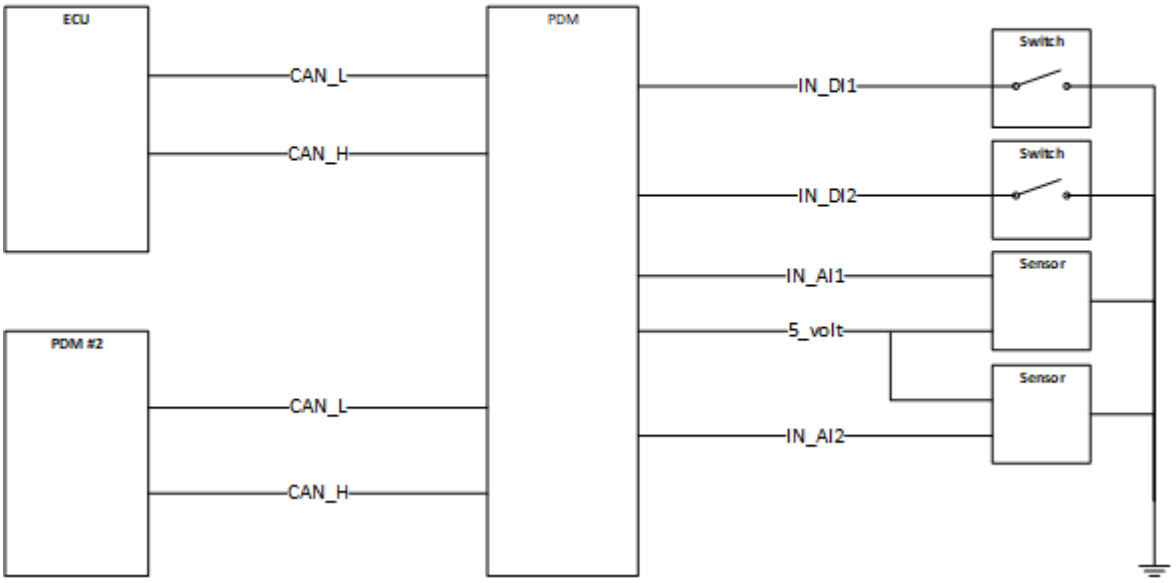
Ensure a stable DC power source within the 7V - 24V range is used. Connect the power input to the designated terminals. 12 volt plus to B1, B8 and C1 Labeled “12V_PWR. Ground to A8 labeled “GND” .

Pinout

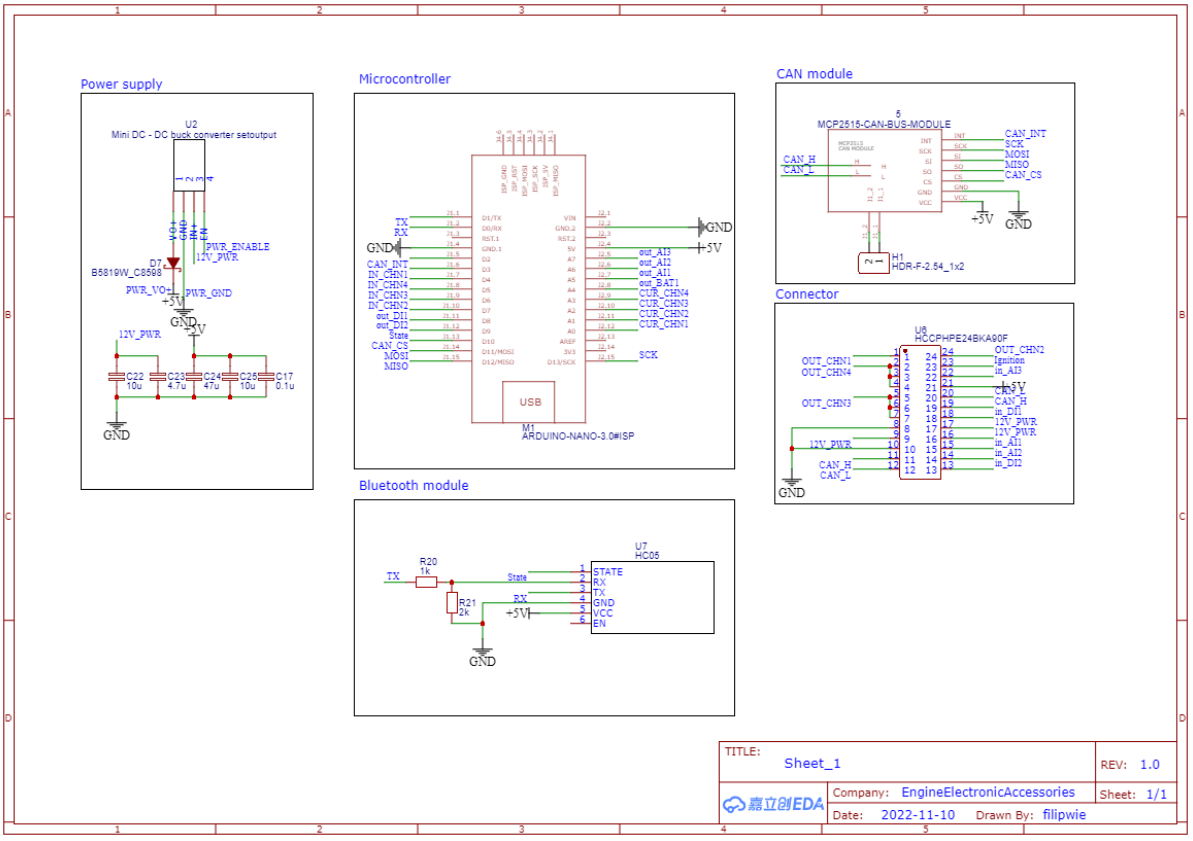
24 pin FCI connector			
	A	B	C
1	OUT_CHN1	12V_PWR	12V_PWR
2	OUT_CHN4	GND	IN_DI1
3	OUT_CHN4	CAN_H	CAN_H
4	OUT_CHN4	CAN_L	CAN_L
5	OUT_CHN3	IN_DI2	5_volt
6	OUT_CHN3	IN_AI2	IN_AI3
7	OUT_CHN3	IN_AI1	Ignition
8	GND	12V_PWR	OUT_CHN2

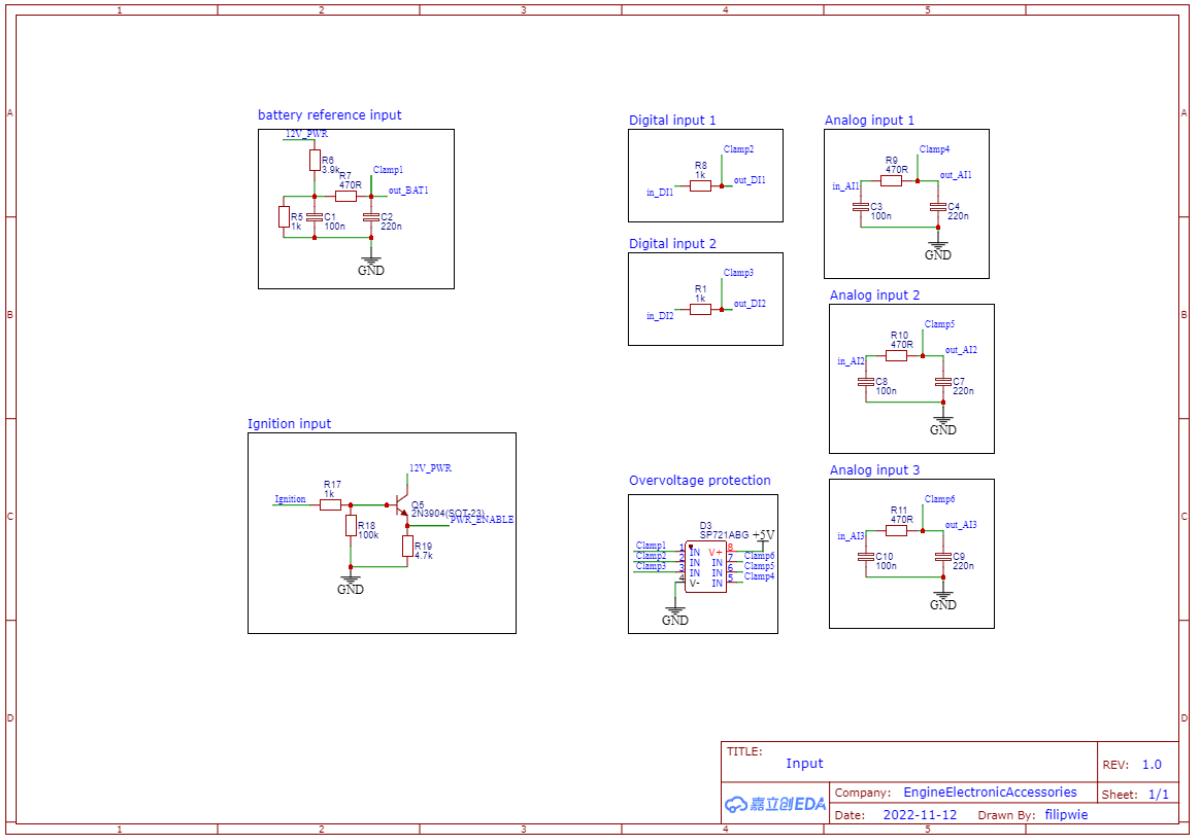
Wiring Diagram

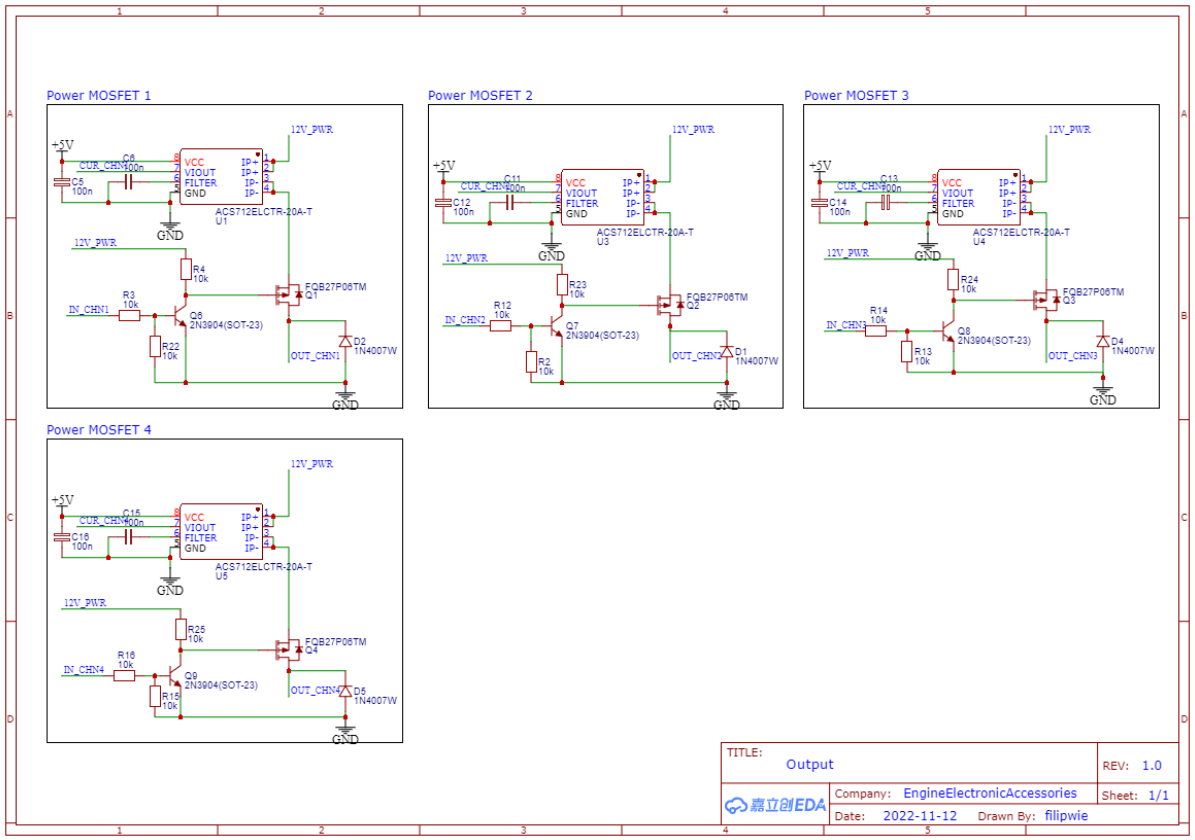




Schematics


Power supply
U2
Mini DC - DC buck converter setoutput
PWR_ENABLE
12V_PWR
D7
B5819W_C8598
PWR_VO
PWR_GND
+5V
GND
12V_PWR
C22 10u
C23 4.7u
C24 47u
C25 10u
C17 0.1u
Microcontroller
TX
RX
GND
CAN_INT
IN_CHN1
IN_CHN4
IN_CHN3
IN_CHN2
out_DI1
out_DI2
State
CAN_CS
MOSI
MISO
USB
M1
ARDUINO-NANO-3.0#ISP
out_AI3
out_AI2
out_AI1
out_BAT1
CUR_CHN4
CUR_CHN3
CUR_CHN2
CUR_CHN1
SCK
CAN module
5
MCP2515-CAN-BUS-MODULE
CAN_H
CAN_L
CAN_INT
SCK
MOSI
MISO
CAN_CS
+5V
GND
H1
HDR-F-2.54_1x2
Connector
U8
HCCPHPE24BKA90F
OUT_CHN1
OUT_CHN4
OUT_CHN3
12V_PWR
CAN_H
CAN_L
OUT_CHN2
Ignition
in_AI3
+5V
CAN_H
in_DI1
12V_PWR
in_AI1
in_AI2
in_DI2
Bluetooth module
U7
HC05
R20
1k
R21
2k
STATE
RX
TX
GND
VCC
EN
TITLE:
Sheet_1
REV: 1.0
Company: EngineElectronicAccessories
Sheet: 1/1
Date: 2022-11-10
Drawn By: filipwie


battery reference input
12V_PWR
R6 3.9k
R7 470R
Clamp1
out_BAT1
R5 1k
C1 100n
C2 220n
GND
Digital input 1
Clamp2
R8 1k
in_DI1
out_DI1
Digital input 2
Clamp3
R1 1k
in_DI2
out_DI2
Analog input 1
Clamp4
R9 470R
in_AI1
out_AI1
C3 100n
C4 220n
GND
Analog input 2
Clamp5
R10 470R
in_AI2
out_AI2
C8 100n
C7 220n
GND
Analog input 3
Clamp6
R11 470R
in_AI3
out_AI3
C10 100n
C9 220n
GND
Ignition input
Ignition
R17 1k
R18 100k
R19 4.7k
Q6 2N3904(SOT-23)
PWR_ENABLE
GND
Overvoltage protection
D3 SP721ABG
+5V
Clamp1
Clamp2
Clamp3
Clamp6
Clamp5
Clamp4
GND
TITLE: Input
REV: 1.0
Company: EngineElectronicAccessories
Sheet: 1/1
Date: 2022-11-12
Drawn By: filipwie


Power MOSFET 1
+5V
12V_PWR
CUR_CHN1
C6 100n
C5 100n
VCC
VIOUT
FILTER
GND
IP+
IP-
ACS712ELCTR-20A-T
U1
R4 10k
R3 10k
IN_CHN1
Q1 FQB27P06TM
Q8 2N3904(SOT-23)
R22 10k
D2 1N4007W
OUT_CHN1
Power MOSFET 2
CUR_CHN2
C11 100n
C12 100n
U3
R23 10k
R12 10k
IN_CHN2
Q2 FQB27P06TM
Q7 2N3904(SOT-23)
R2 10k
D1 1N4007W
OUT_CHN2
Power MOSFET 3
CUR_CHN3
C13 100n
C14 100n
U4
R24 10k
R14 10k
IN_CHN3
Q3 FQB27P06TM
Q8 2N3904(SOT-23)
R13 10k
D4 1N4007W
OUT_CHN3
Power MOSFET 4
CUR_CHN4
C15 100n
C16 100n
U6
R25 10k
R16 10k
IN_CHN4
Q4 FQB27P06TM
Q9 2N3904(SOT-23)
R15 10k
D5 1N4007W
OUT_CHN4
GND
TITLE: Output
REV: 1.0
Company: EngineElectronicAccessories
Sheet: 1/1
Date: 2022-11-12
Drawn By: filipwie

CAN Bus Connection

Connect the CAN High (CANH) and CAN Low (CANL) wires to the respective terminals. If necessary, enable termination using the jumper (120 ohm).

Both CAN_H and CAN_L have two terminals on the 24 pin connector for daisy chain connection.

Input & Output Connections

- **Outputs:** Connect loads to the high-side outputs, ensuring they do not exceed 6A per channel.
- **Analog Inputs:** Accepts 0-5V signals, ideal for sensors.
- **Digital Inputs:** Suitable for switches and logic signals.

Software Configuration

Programming with Arduino

The module is fully compatible with the Arduino IDE. To modify the firmware:

1. Download and install the Arduino IDE.
2. Connect the module via USB.
3. Open the provided source code (https://github.com/filip-w/PDM).
4. Adjust CAN settings and logic as needed.
5. Upload the sketch to the Arduino Nano, make shur to select board “Arduino nano“ and processor “ATmega328P Old bootloader”.

CAN Bus Configuration

Refer to the **PDM.dbc** file for CAN message structure.

CAN baudrate is default set to 500 kbits/s. The speed can be changed by changing the variable “**BaudRate**” in the PDM.ino file.

CAN base ID is 0x500 (1820 deciamal) by default. The CAN base ID can be changed by changing the variable “**BaseCanID**” in the PDM.ino file.

Operation & Testing

1. Power up the module.
2. Verify CAN communication using a compatible tool.
3. Send test signals to control outputs and monitor current measurements.
4. Integrate with your automation or vehicle system.

Troubleshooting

- **No Power:** Verify the power source and connections.
- **CAN Communication Issues:** Check wiring, baud rate settings, and termination.
- **Output Not Functioning:** Ensure correct wiring, check for overload conditions.

Support & Community

For additional support, firmware updates, and community discussions, visit our open-source repository or contact us.

Link to GitHub Repository:
filip-w/PDM: Power Distribution Module (PDM) CAN controlled Arduino based