

# PhidgetMotorControl 1-Motor



**Note:** This revision of the 1065 comes with a built-in heatsink for the driver chip to prevent it from overheating.

The 1065 lets you control the direction, velocity and acceleration of one DC Motor. The motor is powered by an external power supply (9 to 28VDC).

Brushed DC Motors are very simple to understand, but very difficult to control precisely. By applying a voltage, or pulsing a voltage rapidly, at the terminals of the motor, current flows through the motor, and it will begin rotating. Depending on the direction of the current, the motor will rotate clockwise or counterclockwise. The 1065 changes the effective voltage by changing the percentage of time the full supply voltage is applied to the motor. By switching the voltage very quickly (a technique called PWM), the controller is made smaller, more efficient, and cheaper.

Rough control of actual motor speed can be achieved automatically in software by using the Back EMF property, or current sensing.

Precise control of DC motors can be achieved by using encoders. You can implement control loops through software by using the data provided by the on-board digital inputs, analog inputs and encoder input. There is an event that triggers every 16 ms that returns the back-EMF value for the attached motor, which can be very useful for PID control. For more information, see the API in the [User Guide](#).

The 1065 also provides over-current, over-voltage, and over-temperature protection to insure that the board and motor is not damaged.

## **Comes Packaged with**



- Hardware mounting kit:

- 4x M3 Bolts (2cm Length)
- 4x Plastic spacers (5mm Length)
- 4x M3 Nuts

## Product Specifications

### Controller Properties

|                         |                     |
|-------------------------|---------------------|
| API Object Name         | MotorControl        |
| Motor Type              | DC Motor            |
| Number of Motor Ports   | 1                   |
| Velocity Resolution     | 0.39 % Duty Cycle   |
| Acceleration Resolution | 24.5 % Duty Cycle/s |
| Acceleration Min        | 24.5 % Duty Cycle/s |
| Acceleration Max        | 6250 % Duty Cycle/s |
| Acceleration Time Min   | 31.3 ms             |
| Acceleration Time Max   | 8.2 s               |

### Board Properties

|                 |                |
|-----------------|----------------|
| Controlled By   | USB (Mini-USB) |
| API Object Name | DCMotor        |

### Encoder Interface

|                                |                 |
|--------------------------------|-----------------|
| Number of Encoder Inputs       | 1               |
| Count Rate Max                 | 500000 cycles/s |
| Encoder Interface Resolution   | x1              |
| Update Rate                    | 125 samples/s   |
| Time Resolution                | 0.33 ms         |
| Encoder Input Low Voltage Max  | 800 mV DC       |
| Encoder Input High Voltage Min | 2.1 V DC        |
| Encoder Pull-up Resistance     | 2.4 kΩ          |

### Electrical Properties

|                              |            |
|------------------------------|------------|
| Supply Voltage Min           | 9 V DC     |
| Supply Voltage Max           | 28 V DC    |
| Continuous Motor Current Max | 5 A        |
| Overcurrent Trigger          | 8 A        |
| Current Consumption Min      | 20 mA      |
| Current Consumption Max      | 100 mA     |
| USB Speed                    | Full Speed |

### Physical Properties

|                                        |             |
|----------------------------------------|-------------|
| Recommended Wire Size (Power Terminal) | 12 – 24 AWG |
| Operating Temperature Min              | 0 °C        |
| Operating Temperature Max              | 70 °C       |

#### **Voltage Inputs**

|                          |               |
|--------------------------|---------------|
| Number of Voltage Inputs | 2             |
| Input Impedance          | 900 kΩ        |
| 5V Reference Error Max   | 0.5 %         |
| Update Rate              | 125 samples/s |

#### **Digital Inputs**

|                                 |               |
|---------------------------------|---------------|
| Number of Digital Inputs        | 2             |
| Pull-up Resistance              | 15 kΩ         |
| Low Voltage Max (True)          | 800 mV DC     |
| High Voltage Min (False)        | 2.1 V DC      |
| Low Voltage Trigger Length Min  | 4 s           |
| High Voltage Trigger Length Min | 16 s          |
| Digital Input Voltage Max       | ± 15 V DC     |
| Digital Input Update Rate       | 125 samples/s |
| Recommended Wire Size           | 16 – 26 AWG   |