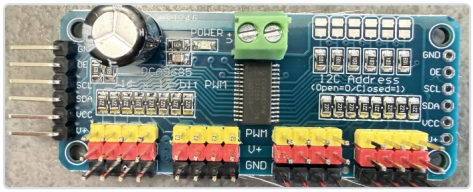
PCA9685 Servo Driver Quick Start

Wire four pins to your board, give the servos their own supply, install one library and move your first servo.

SERVO POWER ON V+ ONLY | I2C ADDRESS 0x40 | V+ 6 V MAX | 50 HZ FOR SERVOS

1 WIRE IT UP



Control header on the left, top to bottom: GND, OE, SCL, SDA, VCC, V+. **Servo headers** along the bottom edge, rows from the edge: GND (black), V+ (red), PWM (yellow). **Screw terminal** at the top: V+ next to the POWER LED, GND on the right.

YOUR BOARD	GND	SDA	SCL	VCC	OE
Uno, Nano	GND	A4	A5	5V	GND
Mega 2560	GND	20	21	5V	GND
ESP32	GND	GPIO21	GPIO22	3V3	GND

Leave the V+ pin on the control header unconnected to your board. Servo power goes in through the screw terminal.

Plug the servo into channel 0, the first column at the control-header end, with its brown or black wire on the GND row at the board edge.

Give the servos their own 5 V or 6 V supply on the screw terminal, V+ to the screw next to the POWER LED. Never feed servos from VCC or from your board's 5V pin: a moving servo pulls enough current to reset it. Check polarity before switching on, and never go above 6 V.

2 FIRST START

1. **You need** one servo, five female-to-male jumper wires, a 5 V supply of 1 A or more for the servo, a USB cable and the Arduino IDE.
2. **Wire the four pins and OE** from the table, with everything unplugged.
3. **Connect the servo supply** to the screw terminal and plug the servo into channel 0.
4. **Install the library.** Open **Tools > Manage Libraries**, search **PCA9685** and install **Adafruit PWM Servo Driver Library**. Click **Install all** when it asks about Adafruit BusIO.
5. **Upload the test sketch** on the right and open the Serial Monitor at **115200** baud.
6. **Switch on the servo supply.** The POWER LED lights and the servo starts to move.

3 TEST SKETCH

```
// PCA9685 first test: move a servo on channel 0
#include <Wire.h>
#include <Adafruit_PWMServoDriver.h>

Adafruit_PWMServoDriver pwm(0x40);

void setup() {
  Serial.begin(115200);
  if (!pwm.begin()) {
    Serial.println("PCA9685 not found");
    while (1) delay(10);
  }
  pwm.setOscillatorFrequency(27000000);
  pwm.setPWMFreq(50);  // 50 Hz for servos
  Serial.println("PCA9685 ready");
}

void loop() {
  pwm.writeMicroseconds(0, 1000);  // one end
  delay(1000);
  pwm.writeMicroseconds(0, 1500);  // centre
  delay(1000);
  pwm.writeMicroseconds(0, 2000);  // other end
  delay(1000);
}
```

Expected result: PCA9685 ready prints once, then the servo on channel 0 moves to one end, the centre and the other end, one second apart, over and over. Change the first number in **writeMicroseconds** to drive channels 1 to 15.

4 NOT WORKING?

WHAT YOU SEE	TRY THIS
PCA9685 not found	Check VCC, GND, SDA and SCL, and that SDA and SCL are not swapped. Run an I2C scanner: it should report 0x40.
PCA9685 ready, but the servo does not move	The servo has no power. Check the supply on the screw terminal and that OE is on GND.
Your board resets or the servo twitches	The servo is on the wrong supply, or the supply is too weak. Use a separate 5 V supply with about 1 A for each micro servo moving at once, more for larger servos.
Servo buzzes at the ends	Change 1000 and 2000 in the sketch to 1100 and 1900.
Two boards clash	Bridge an address jumper on one board so each has its own address.

5 NEXT STEPS

- **Sixteen servos:** plug them into channels 1 to 15 and size the supply for all of them moving at once.
- **LEDs and dimming:** the same outputs drive LED dimmers and MOSFETs. Use **setPWM** and a higher frequency.
- **More boards:** bridge an address jumper (0x41, 0x42 and up) and chain them from the six holes at the far end.
- **Mounting:** four holes for M2.5 screws. The datasheet has the positions and the I2C address table.

This guide and the datasheet online

Scan for this guide and the full datasheet on the product page. Stuck? Email **support@nznelectronics.co.nz**

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