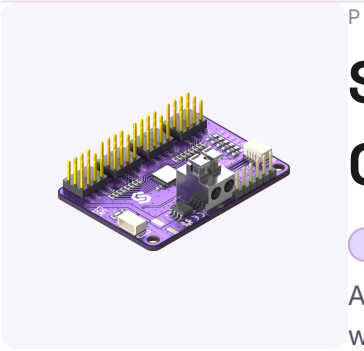


PRODUCT DATASHEET

Soldered PWM & Servo Driver 16-Channel 12-bit PCA9685 breakout

333191

A 16-channel, 12-bit PWM driver that runs up to 16 servos over one I2C bus, with a separate screw terminal for servo power.

Full product documentation, files and tutorials: **solde.red/333191**

CORE ATTRIBUTES

SKU	333191
DIMENSIONS	54.0 × 38.0 × 7.2 mm
ORIGIN	HR
BARCODE	732388638307

DESCRIPTION

This breakout drives up to 16 hobby servos or PWM-controlled outputs from a single I2C connection, so you do not have to tie up sixteen timer-capable pins on your microcontroller. It is built around the NXP PCA9685, which generates all sixteen signals from its own 25 MHz oscillator: once you have written a channel's on and off times, the board keeps that pulse running without further attention from your code.

Each channel has 12-bit resolution, meaning 4096 steps across the period, and the PWM frequency is shared by all sixteen outputs and programmable from roughly 24 Hz to 1526 Hz. At the 50 Hz hobby servos expect, that resolution gives you fine positioning; at higher frequencies the same outputs work for LED dimming or for feeding the inputs of a motor driver.

Servo power comes in through the 5 mm screw terminal on its own rail, so motor current never travels through your microcontroller's supply. A P-channel MOSFET on that input protects the board if you wire the supply backwards, and a 100 µF bulk capacitor next to it absorbs the current spikes servos produce as they start moving.

You connect over I2C through either of the two Qwiic connectors, with no soldering and the second one free for chaining the next board, or through the header, which also breaks out the output enable pin and the servo power rail. Six solder jumpers set address bits so the board can sit anywhere from 0x40 to 0x7F.

Arduino and MicroPython libraries are both available. Each gives you a setServoAngle() call that takes a channel and an angle in degrees, with the pulse range configurable, plus raw setPWM() access when you would rather work in tick counts yourself.

TECHNICAL DETAILS

- **Channels:** 16, individually programmable
- **Resolution:** 12-bit, 4096 steps per channel

- **PWM frequency:** 24 Hz to 1526 Hz, shared by all channels. 200 Hz at IC power-on; the Soldered libraries set 50 Hz on init
- **Interface:** I2C, PWM
- **Default I2C address:** 0x40
- **Address range:** 0x40 to 0x7F
- **Logic supply:** 3.3 V
- **Logic supply current:** 6 mA typical, 10 mA maximum
- **Output drive:** 25 mA sink, 10 mA source per channel at 5 V; 400 mA total for the package
- **Qwiic connectors:** 2 x Qwiic
- **Output enable:** OE pin, active LOW, pulled low on board so outputs are enabled by default
- **Mounting:** 2 × 3.2 mm holes
- **Board dimensions:** 54 × 38 mm
- **Operating temperature:** -40 °C to +85 °C

SPECIFICATIONS

INTERFACE	I2C, Pwm
QWIIC COMPATIBLE	Yes
I2C ADDRESS DEFAULT	0x40
I2C ADDRESS CHANGEABLE	Yes
BREADBOARD COMPATIBLE	Yes
IC PART NUMBER	PCA9685BS,118
SUPPLY VOLTAGE MIN V	3.3
SUPPLY VOLTAGE MAX V	3.3
LOGIC LEVEL	3V3 Only
OPERATING CURRENT (MA)	6 mA
SLEEP CURRENT UA	3.2
MAX OUTPUT CURRENT A	400

DOCUMENTS

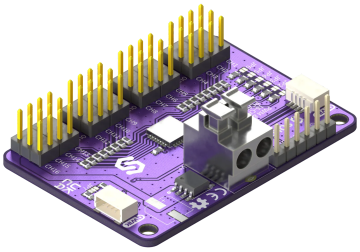
Main IC Datasheet · EN	https://cms.soldered.com/products/333191/documents/ic-datasheet/333191_ic-datasheet_8ccb32.pdf

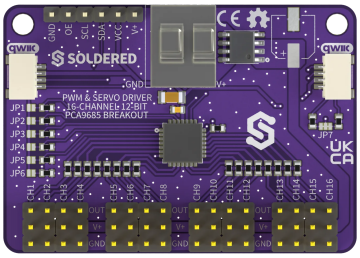
LINKS

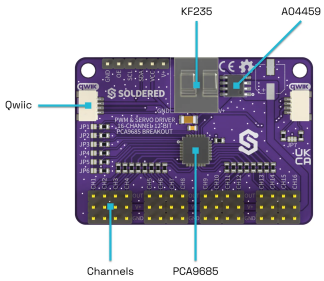
Full Documentation	https://docs2.soldered.com/soldered-pwm-servo-driver-16-channel-12-bit-pca9685-breakout/
Arduino Library	https://github.com/SolderedElectronics/Soldered-PCA9685-PWM-Servo-Driver-Arduino-Library

MicroPython: Get Started	https://github.com/SolderedElectronics/Soldered-PCA9685-MicroPython-Library
MicroPython Module	https://github.com/SolderedElectronics/Soldered-PCA9685-MicroPython-Library
Pinout	https://cms.soldered.com/products/333191/media/333191_pinout-png_3f4c80.png

GALLERY







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