

Motors

3 kinds:

- Mg 995
- mg90D
- Simple servo

How to connect to raspberry pi:

Use servo shield:

The one we've got is adafruit motor shield v2.3, for arduino, could run on raspberry pi using I2c but can only control 4 dc motors at a time.

The one we need:

Adafruit 16-channel PWM / Servo Hat for raspberry pi - mini Kit

Allows us to control 16 servos

Item list:

- 10x mg996R servos or mg90D
 - mg996R 360 deg £9 each → recommended if we are scaling the hand
 - mg90D 90deg £7 each, most people say it moves in 180 degrees?
 - Note order from pi-hut, counterfeit servos are too common on amazon

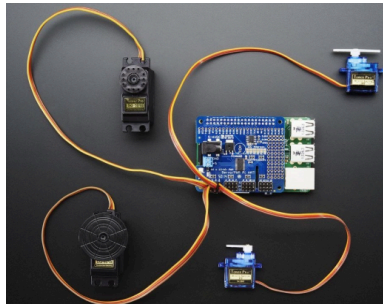


Recommended → MG996R

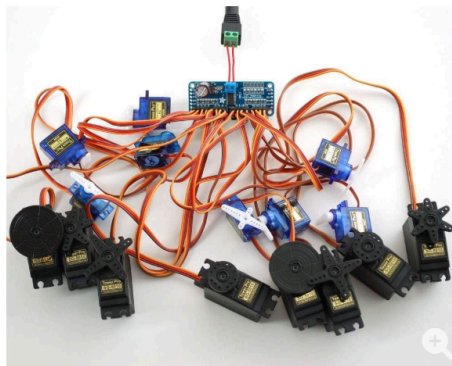
<https://thepihut.com/products/towerpro-servo-motor-mg996r-metal-gear-360>

- 16-channel PWM:
 - Waveshare 16-Channel Servo Driver HAT → £16.20
 - Pre assembled no need for soldering
 - Adafruit 16-Channel PWM/Servo HAT → £17.40 → recommended
 - Requires soldering

- More reliable brand
- Power adapter integrated

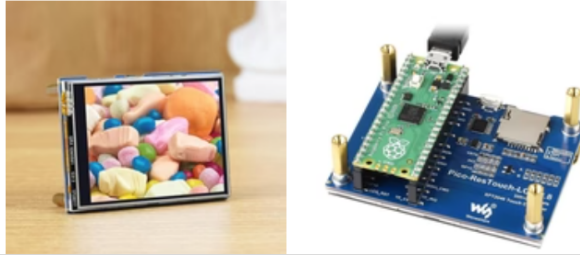


- Adafruit 16-Channel 12-bit PWM/Servo Driver - I2C interface (PCA9685): £14.70
 - Smaller
 - Connect power adapter through wiring (not built in)



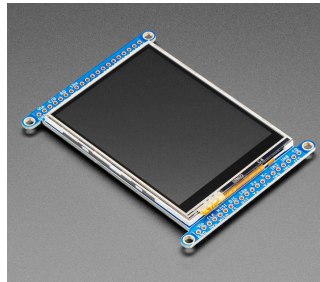
<https://thepihut.com/products/adafruit-16-channel-12-bit-pwm-servo-driver-i2c-interface-pca9685>

- 2 2.8" LCD screens:
 - Should use SPI TFT for faster response rate
 - Do we want to get it with breakout board or bare
 - Are we using screen with a pico or without
 - With pico cost $\rightarrow 17.6 + 4 = 21.6$
 - Boarded tft $\rightarrow 29.6$
 - Bare tft $\rightarrow 17$
 - Pico screen



[2.8" Touchscreen IPS LCD Display for Raspberry Pi Pico \(320x240\) | The Pi Hut](#)

- Spi tft screen boarded



[2.8" TFT LCD with Touchscreen Breakout Board with MicroSD Socket \(ILI9341\) | The Pi Hut](#)

- With pico:
 - Offloads image rendering from pi
 - Added weight on the end of the arm
 - More complex communication raspberry pi \longleftrightarrow pico x2
 - Less pins used on raspberry pi
 - Slight delay in rendering
- No pico:
 - Direct image rendering
 - Less complexity communication wise / code
 - Less complicated wiring

Face, 3.5",

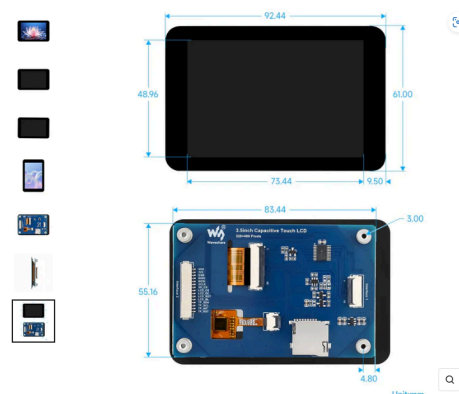
with pico, no need to worry about added weight face bigger than the hand, similar price and still small but more area to show the text

→ £27 + £4 = £31 (actual price £21.6 but out of stock in pi hut have to use amazon)



[Waveshare 3.5inch Touch Display Module for Raspberry Pi Pico 65K Colors 480×320 Pixels Resistive Touch Controller XPT2046 ILI9488 Driver Using SPI Bus : Amazon.co.uk: Business, Industry & Science](https://www.amazon.co.uk/Business-Industry-Science/WaveShare-3-5inch-Touch-Display-Module-for-Raspberry-Pi-Pico-65K-Colors-480x320-Pixels-Resistive-Touch-Controller-XPT2046-ILI9488-Driver-Using-SPI-Bus/dp/B07K9K9K9K)

Cheaper option and no pico, more complex:



[3.5" Capacitive Touch IPS LCD Display \(320 x 480\) | The Pi Hut](https://www.thepihut.com/products/3-5-inch-capacitive-touch-ips-lcd-display-320-x-480)

Final list:

- 10x mg996r 360 servos: £90
- 2x, 2.8" lcd ips pico screen: £35
- 1x, 3.5" display pico: £27
- 3x pico, £15:
- Adafruit PCA9685 pwm 16-channel, £14.60

£181.60

Owned items:

- Raspberry pi 4B
- Raspberry pi camera module v2