

# Motor Reference Guide

Learn how to control motors on your Spike robot!

## Import the Library

```
import runloop
from hub import port, motion_sensor
import motor
import motor_pair
```

## Single Motor Basics

### Connect to a Motor

```
# Motor plugged into port A
# Use port.A, port.B, port.C, port.D, port.E, or port.F
```

### Run the Motor

```
# Run forward for degrees (async)
async def main():
    await motor.run_for_degrees(port.A, 360, 500) # 360 degrees at 500 speed

runloop.run(main())

# Or run to absolute position
async def main():
    await motor.run_to_absolute_position(port.A, 0, 500) # Go to 0 degrees

runloop.run(main())
```

### Motor Direction

```
async def main():
    # Run forward
    await motor.run_for_degrees(port.A, 360, 500)

    # Run backward (use negative degrees)
    await motor.run_for_degrees(port.A, -360, 500)
```

```
runloop.run(main())
```

## Check Motor Position

```
# Get current position
position = motor.relative_position(port.A)
print(position)

# Reset position to 0
motor.reset_relative_position(port.A, 0)
```

## 🚗 Motor Pair (Two Motors Together)

Perfect for driving robots with two wheels!

### Connect Motor Pair

```
# Pair motors in ports A and B
motor_pair.pair(motor_pair.PAIR_1, port.A, port.B)
```

### Drive Forward/Backward

```
async def main():
    # Move forward for degrees
    await motor_pair.move_for_degrees(motor_pair.PAIR_1, 360, 0)  # 360 degrees, 0
steering

    # Move backward (use negative degrees)
    await motor_pair.move_for_degrees(motor_pair.PAIR_1, -360, 0)

runloop.run(main())
```

### Turn the Robot

```
async def main():
    # Turn right (positive steering)
    await motor_pair.move_for_degrees(motor_pair.PAIR_1, 360, 100)

    # Turn left (negative steering)
    await motor_pair.move_for_degrees(motor_pair.PAIR_1, 360, -100)

    # Gentle curve (steering -100 to 100)
```

```
await motor_pair.move_for_degrees(motor_pair.PAIR_1, 720, 50)

runloop.run(main())
```

## Start/Stop Motor Pair

```
# Start moving (non-blocking)
motor_pair.move(motor_pair.PAIR_1, 0) # 0 steering, default velocity

# Move with specific steering
motor_pair.move(motor_pair.PAIR_1, 50, velocity=500) # 50 steering, 500 velocity

# Stop moving
motor_pair.stop(motor_pair.PAIR_1)
```

## Quick Examples

### Example 1: Make Motor Spin

```
import runloop
from hub import port
import motor

async def main():
    await motor.run_for_degrees(port.A, 360, 500) # One full turn

runloop.run(main())
```

### Example 2: Drive Forward and Back

```
import runloop
from hub import port
import motor_pair

motor_pair.pair(motor_pair.PAIR_1, port.A, port.B)

async def main():
    await motor_pair.move_for_degrees(motor_pair.PAIR_1, 720, 0) # Forward
    await motor_pair.move_for_degrees(motor_pair.PAIR_1, -720, 0) # Backward

runloop.run(main())
```

### Example 3: Square Drive Pattern

```
import runloop
from hub import port
import motor_pair

motor_pair.pair(motor_pair.PAIR_1, port.A, port.B)

async def main():
    for i in range(4):
        await motor_pair.move_for_degrees(motor_pair.PAIR_1, 360, 0)    # Forward
        await motor_pair.move_for_degrees(motor_pair.PAIR_1, 180, 100)   # Turn
    right

runloop.run(main())
```

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**Happy Building!** 🎉