



Azkoyen Hopper U-II — Wemos D1 Mini — Raspberry Pi Wiring Diagram

Control Mode: PULSES (Standard) | 12V DC Power | USB Serial Communication

Hopper Connector Pinout (2x5 Molex, Parallel Mode)

| Pin | Name | Direction | Function | Connects To |
|-----|---------|-----------|-----------------------------------|--------------------------------|
| 1 | VCC | Power In | +12V motor & logic power | 12V supply + |
| 2 | VCC | Power In | +12V (both pins required) | 12V supply + |
| 3 | GND | Power GND | Ground reference | 12V supply - & Wemos GND |
| 4 | GND | Power GND | Ground (both pins required) | 12V supply - & Wemos GND |
| 5 | Control | Input | Dispense command (mode-dependent) | BC547 collector via R2 pull-up |
| 6 | Coin | Output | Pulse per coin dispensed (~18ms) | PC817 LED via R3 |
| 7 | H Level | Output | Hopper full detection | Not connected (optional) |
| 8 | Error | Output | Jam / motor error | Wemos D5 via R5/R6 divider |
| 9 | Empty | Output | Coin bay empty | Wemos D6 via R7/R8 divider |

Wemos D1 Mini Pin Mapping

| Wemos Pin | GPIO | Signal | Interface | Logic |
|-----------|--------|------------|-----------------------------------|---|
| D1 | GPIO5 | Control | NPN open-collector + 10kΩ pull-up | HIGH = hopper active (inverted by transistor) |
| D2 | GPIO4 | Coin | 10kΩ / 3.3kΩ voltage divider | Pulse HIGH (~2.98V) = coin dispensed |
| D5 | GPIO14 | Error | 10kΩ / 3.3kΩ voltage divider | HIGH (~2.98V) = error active |
| D6 | GPIO12 | Empty | 10kΩ / 3.3kΩ voltage divider | HIGH (~2.98V) = hopper empty |
| GND | - | Common GND | Direct wire to 12V supply GND | Shared ground reference |

Important Notes

1. POWER: Hopper requires 12V DC. Motor startup surge is ~3A for ~100ms. A 2200µF 25V capacitor across the 12V rail absorbs this surge with a 2A supply.
2. COMMON GROUND: The 12V supply GND MUST be connected to the Wemos GND pin. Without this, transistor and voltage dividers have no reference.
3. CONTROL MODE: Set hopper jumpers to STANDARD + PULSES. Each pulse on Control = one coin dispensed. The hopper handles motor timing internally.
4. TRANSISTOR (Q1): BC547 NPN in open-collector config. R2 (10kΩ) pulls Control to 12V when transistor is OFF. Wemos HIGH → transistor ON → Control pulled to GND = active.
5. VOLTAGE DIVIDERS: All three signals (Coin, Error, Empty) use identical 10kΩ + 3.3kΩ dividers. This converts 12V to ~2.98V, safely under the 3.3V GPIO max.
6. COIN SIGNAL: The Coin pin pulses briefly (~18ms) each time a coin exits. Use an interrupt on D2 (RISING or FALLING edge depending on hopper logic setting).
7. USB SERIAL: Wemos connects to Raspberry Pi via USB. This provides both 5V power and serial communication (/dev/ttyUSB0 at 115200 baud).
8. BC547 PINOUT: Flat side facing you, pins left to right = E (Emitter), B (Base), C (Collector). Double-check with your datasheet!

Connection Details, Pin Mapping & Notes

9. TIME OUT: Implement a 5s timeout counter. If no coin pulse received within 5s of starting, stop dispensing to prevent motor damage.

10. ACTIVE HIGH/LOW: Check your hopper's logic jumper setting. The Coin, Error and Empty signals may be active HIGH or LOW depending on configuration.