



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

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

Sheet 1 of 2

Rev 1.0 — Feb 2026

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!

9. TIMEOUT: Implements a 5-second timeout in software. 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.