Force Sensor Calibration (HX711 + 100kg Load Cell)

Date: 13.02.2026

Reference Weights

Barbell plates, weighed with kitchen scale.

Weight Set	Mass
Point 1 (full)	30.9 + 30.5 + 2475 + 2422 + 2446 + 2478 + 2439 + 2442 + 2462 + 608 g = 17.8334 kg
Point 2 (reduced)	10.4834 kg

Procedure

1. Stepper driver unpowered (no motor movement, sensor acquisition only).
2. Full reference weight (17.8334 kg) hung from sensor.
3. Measurement started via Python script, raw values recorded.
4. Mean raw value determined: ~800,200.
5. Calibration factor calculated: F / raw = 174.9 N / 800,200 = 2.186E-04.
6. Verification with full weight: reading 172.455 N instead of 174.9 N → factor corrected to 2.217E-04.
7. Second verification after correction: 174.642 N (target: 174.9 N).

Results

Test Point	Target	Measured	Deviation
17.8334 kg (174.9 N)	174.9 N	174.642 N	-0.15%
10.4834 kg (102.84 N)	102.84 N	102.27 N	-0.56%

Calibration Constant

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FORCE_CALIBRATION = 2.217E-04
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