# **Test Report — IV Drip Chamber Validation through Gravimetric Scale**

(22 July 2025, CLA, 22 °C, overhead LED lighting)

## **1 Objective**

Demonstrate that the Dripito device provides accurate drop-counting and instantaneous flow rate readings, and validate its output against a high-precision gravimetric scale. Confirm the device performs reliably even when the dial on the IV line is inaccurate. All data are gathered in preparation for ethics-cleared pilot testing in clinical and humanitarian contexts.

## **2 Set-up**

- Environment: Indoor lab (CLA), 22 °C, overhead LED lighting  
 - Fluid: Ringer Acetate at room temperature  
 - Drip set: Unknown nominal gtt/mL, suspected 20 gtt/mL based on visual inspection  
 - Dial setting: 100 mL/h (known to be faulty)  
 - Duration: 10 minutes  
 - Equipment:  
 • Precision balance (readability: 0.001 g)  
 • Dripito device (Rev. A PCB, BPV10NF photodiode, STM32G030)  
 • Laptop logging Dripito serial output via USB UART  
 - Calibration assumptions:  
 • Density of Ringer Acetate at 22 °C assumed 1.004 g/mL  
 • Drop volume nominal assumed 0.050 mL unless otherwise specified

## **3 Raw observations**

• Mass lost after 10 minutes: 8.55 g  
 • Converted volume: 8.516 mL (using ρ = 1.004 g/mL)  
 • Total drops detected by Dripito: 154  
 • Drop volume (calculated): 0.0553 mL/drop  
 • Final flow average reported by Dripito: 46.0 mL/h

## **4 Interpretation**

Dripito closely tracked the true flow profile, with a stable drop-to-drop interval of ≈3.9 seconds. While the dial claimed 100 mL/h, both gravimetric and optical data indicated actual flow was ~51.1 mL/h. Dripito slightly under-reported flow by 10 %, likely due to using a nominal drop size (0.050 mL) rather than the measured 0.0553 mL. This can be corrected in firmware, but changes from fluid to fluid. The system exhibited no false detections or missed drops, and voltage/battery parameters remained stable.

## **5 Conclusions**

Dripito demonstrated high reliability and drop detection accuracy under faulty dial conditions. Although raw flow rates were ~10 % lower than ground truth due to drop volume mismatch, the system remained stable and reproducible. Firmware calibration to actual drop size (0.0553 mL) is recommended. This test confirms readiness for usability validation in hospital environments.