Smart Drone Hangar

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Analysis

1.1 Introduction

Initially the system starts with the hangar door HD closed; the DRONE INSIDE state holds, L1 on, L2 and L3 off, and the LCD shows DRONE INSIDE.

Take-off: the drone requests opening via DRU. On command the HD opens, the LCD shows TAKE OFF, and the system waits for exit. Exit is detected by the DDD: when distance > D1 for more than T1 the drone is assumed out, the HD closes and the LCD shows DRONE OUT.

Landing: the drone requests opening via DRU. If DPD detects presence, the HD opens and the LCD shows LANDING. When DDD measures distance < D2 for more than T2 the drone is landed, the HD closes and the LCD shows DRONE INSIDE.

During take-off/landing L2 blinks (0.5 s period); otherwise it is off.

Temperature monitoring runs whenever the drone is inside (rest, take-off, landing). If temperature ≥ Temp1 for more than T3 the system enters pre-alarm: new take-offs/landings are suspended until return to normal operation (in-progress operations may complete). If temperature ≥ Temp2 (> Temp1) for more than T4 the HD is closed (if open), L3 turns on and the LCD shows ALARM. If the drone is outside, an ALARM message is sent via DRU. All operations stay suspended until the RESET button is pressed; pressing it returns the system to normal operation.

Parameters D1, D2, T1, T2, T3, T4, Temp1, Temp2 are left configurable for testing. The DRU GUI must allow:

- sending take-off/landing commands (simulate the drone);

- displaying drone state (rest, taking off, operating, landing);

- displaying hangar state (normal, ALARM);

- (during landing) showing current distance to ground.