

4.2 Payment Subsystem

Goal: Retrieve license plate and balance from RFID card, calculate dues, process payment, and update payment status.

Steps:

1. **RFID Data Retrieval:**

- RFID PCD module reads:
 - Plate number (Block 2)
 - Balance (Block 4)

2. **Data Forwarding to PC:**

- process_payment.ino sends this data via serial to process_payment.py.

3. **Payment Logic in process_payment.py:**

- Parses serial message for plate and balance.
- Searches for plate in plates_log.csv.
- Calculates parking duration: $\text{current_time} - \text{entry_time}$
- Computes due amount (e.g., RWF 200/hour).
- Logs amount in the amount column; keeps payment_status = 0.

4. **Transaction Execution:**

- Sends required amount back to Arduino.
 - Arduino deducts amount from PICC and rewrites new balance.
 - Sends “done” signal to PC upon success.
 - Python script updates payment_status = 1.
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