

Project Modules

Hardware:

- Raspberry Pi 3 model B (1 GB RAM).
- Raspberry Pi 3 heatsinks.
- SD Card.
- Raspberry Pi 3 case and adapter.
- RTC Module (DS3231 RTC Breakout).
- LEDs (optional).

Software:

- **Raspberry Pi (Hub):**
 - 1- Core app (Central brain of the system) that responsible for communication with other devices and sync data with cloud.
 - 2- Embedded web server for configuration purposes.
 - 3- Database.
- **Mobile App:**

For user control, can be used locally or remotely.
- **MQTT Broker:**

For remote actions between the hub and the mobile app.
- **Cloud Rest API:**

For syncing data and logs with cloud side.
- **Web Dashboard (Optional):**

For reporting and analytical purposes.

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Protocols:

- **HTTP:**
 - Communication between the hub and placed units.
 - Communication between the hub and cloud API (logging/reporting).

- **MQTT:**
 - Communication between the mobile app and broker (for remote control).
 - Communication between the mobile app and the hub (for local control).