PiHome – home automation done with Raspberry PI and Python

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PyMalta 5th December ‘17, Sliema
wojtek.sznapka Hello Raspberry pi :-)
Features

• Steering (switches):
  – Floor heating steering (on / off / delayed)
  – Hot water pump steering
  – Lights
  – Window blinds
  – Garage gate
  – Main entrance gate

• Scheduling:
  – Define schedules for any switch (with delay), eg. blinds up every 6AM

• Sensors:
  – Current temperature
  – Charts

• History:
  – Switches state
  – Temperatures
Hardware

• Raspberry PI B

• Switches module (230V) controlled via Ethernet (ready-made board)

• Switches module RM8 5V controlled via GPIO

• 12V relays for switching 230V in window blinds

• Dallas ds18b20 one wire temperature sensors

• Bread-board and bunch of wires
Software

- **Raspbian**
  - with GPIO modules
  - Supervisord
  - Apache + WSGI

- **Pihome-api**
  - Python
  - REST API built with Flask
  - Python-crontab

- **PiHome**
  - AngularJS as a SPA frontend
  - Twitter Bootstrap
  - optimized for mobile

- **CLI tasks**
  - Queue consumers
  - Celery tasks
Software

- **RabbitMQ** – relay “store” requests (failover)
- **Celery** - “delayed” on / off
- **MongoDB** – history of sensors and switches
- **Memcached** – cache switches status
- **Crontab module** to setup schedule (via internal curl to API)
<table>
<thead>
<tr>
<th>Switch</th>
<th>Duration</th>
<th>Schedule</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lampa hall</td>
<td>5 hours</td>
<td>Every: Day at 0 : 30</td>
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</tr>
<tr>
<td>Lampa schody</td>
<td>5 hours</td>
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<td>Roleta parter up</td>
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<td>Every: Day at 5 : 55</td>
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<tr>
<td>Roleta parter down</td>
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<td>Every: Day at 23 : 0</td>
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<tr>
<td>Led przód</td>
<td>6 hours</td>
<td>Every: Day at 21 : 10</td>
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<td>6 hours</td>
<td>Every: Day at 21 : 10</td>
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Lesson learned

• Don't rely much on WiFi (have fallback / queue)
• Don't play around with higher voltages unless you're pretty sure what you're doing...
• Be prepared for frequent and random restarts (and SD cards failures…)
• Don't use GPIO pins which have different initial (on boot) state than you like to use with your peripheral device
• There plenty of ready made components, soldering is often last thing, if you want to get things fast
Thanks :-)

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