# Brief

These are the documentation of EMS firmware.

# Procedural Firmware

The firmware consist of multiple modes:

1. Registration
2. Operational
3. WiFi and GPRS Setting
4. Remote Discovery

Global initialization:

1. Init peripheral and iface (e.g. TFT)

## Registration Mode

Single loop:

1. Update LCD display
2. Init panel parameter (e.g. SSID, PASS)
3. Connect to network
4. Check connection
5. Get panel parameter (based on WiFi MAC address) from cloud server
   * getCmdURL, getCmdKey, cmdExecURL, cmdExecKey, sendDataURL, sendDataKey
6. Update LCD display with getCmdKey
7. Verify registration with getCmdKey
8. Save panel parameter

Notes:

1. Get panel parameter from cloud server
   * Cmd:

**192.168.128.69/emma/data/register18fe349936be.json** (18fe349936be is WiFi MAC address)

* + Response:

**[{"getCmdURL":"(/talkbacks/887/commands/last?api\_key=)","getCmdKey":"(ACM8XW24UDVY1GTV)","cmdExecURL":"(/execute?api\_key=)","cmdExecKey":"(2)","sendDataURL":"(/update?api\_key=)","sendDataKey":"(99N5T6AH3NY4UKNA)"}]**

1. Verify registration with getCmdKey
   * Cmd:

**192.168.128.69/emma/data/verifyACM8XW24UDVY1GTV.json** (ACM8XW24UDVY1GTV is getCmdKey)

* + Response:
    1. Success: **[{"status":"registered"}]**
    2. Failed: **[{"status":"failed"}]**

## Operational Mode

Initialization:

1. Init list of Remotes ✓
2. Init panel parameter (e.g. SSID, PASS) ✓
3. Connect to network ✓
4. Check connection ✓
5. Check firmware update from server 🗶
6. Execute command for switch 🗶

In loop:

1. Update LCD display
   1. Interface ✓
   2. Energy consumption 🗶
   3. State of switch 🗶
2. Connect to network ✓
3. Check connection ✓
4. Check device (IR remote, RF switch) connection 🗶
5. Get command from server ✓
6. Process command
   1. Parse command ✓
   2. Execute command
      1. Command for remote ✓
      2. Command for switch 🗶
   3. Save command for switch 🗶
   4. Send execution status 🗶
7. Send energy data to server 🗶

Notes:

1. Command types:
   * Remote Control
     + Example: **[{“type”:0},{"id":”234”,"mac":"00262903424E","cmd":1},{"id":”345”,"mac":"00262903424F","cmd":2}]**
     + Means run CMD1 file to device with mac = 00262903424E…
   * Switch Control
     + Example:

**[{“type”:1},{"id":”234”,"sw":”1”,"cmd":1},{"id":345,"sw":”2”,"cmd":0}]**

* + - Means switch sw 1 to 1 (ON) and sw 2 to 0 (OFF)
  + Notes
    - Command service should be consumed only once
    - Combine command remote control and switch control

1. Energy data
   * Example:

[**http://api.thingspeak.com/update?api\_key=99N5T6AH3NY4UKNA&field1=90**](http://api.thingspeak.com/update?api_key=99N5T6AH3NY4UKNA&field1=90)

**(POST command)**

**(Server IP address)**

## WiFi and GPRS Setting

Initialization:

1. Init panel parameter ✓
2. Init WiFi Server ✓

In loop:

1. Update LCD display ✓
2. Receive data ✓
3. Parse data ✓
4. Save SSID and PASS setting ✓
5. Save GPRS setting 🗶

## Remote Discovery

Single loop:

1. Update LCD display (this mode only support ETH) ✓
2. Clear remote list (optional) -
3. Init ETH ✓
4. Discover remotes ✓
5. Update LCD display with number of remote found ✓
6. Save remote list ✓
7. Send remote list to cloud 🗶