# Tasmota-Plus
# Expansion Temperature Sensor

# ES-DS18
# User Guide

V20210315

Latest Version of this document available at:
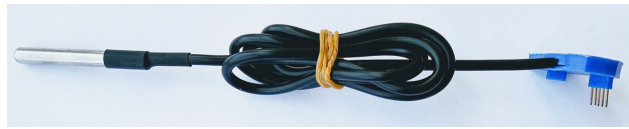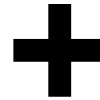https://github.com/UBWH/ubwh.github.io/blob/master/assets/UserGuides

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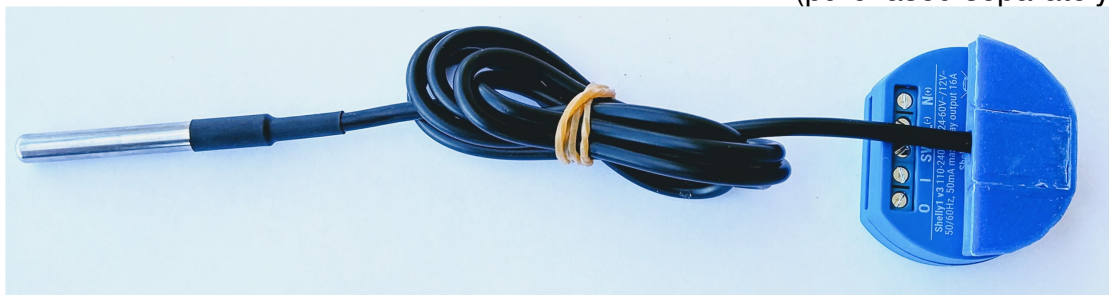
# Introduction

The ES-DS18 is an expansion sensor designed to be used with a **SS-1CHPro**[1] interface.



**ES-DS18**                    **SS-1CHPro**
(purchased separately)



When combined with an **SS-1CHPro** the available features include:

| | |
|---|---|
| **Temperature monitoring** | Locally, or from anywhere in the world, accessible by any web browser. |
| **Temperature logging** | When combined with an openHAB/MQTT[2] server |
| **Manual relay control** | Locally, or from anywhere in the world, accessible by any web browser. |
| **Automatic relay control based on temperature** | The relay (16 A / 240 V) in the **SS-1CHPro** can be switched ON/OFF based on temperature limits defined by the installer.<br><br>Example:<br>Temperature above 25 C → turn relay ON<br>Temperature below 24 C → turn relay OFF |
| **Contact Switch monitoring** | The **SS-1CHPro** reports the state of an external contact switch. |

**Table 1 – Available Features**

The **SS-1CHPro** provides to the EP-DS18:

- Power
- WiFi interface

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[1] https://ubwh.com.au/SS-1CHPro
[2] https://openhab.org &  https://mqtt.org

## Hardware
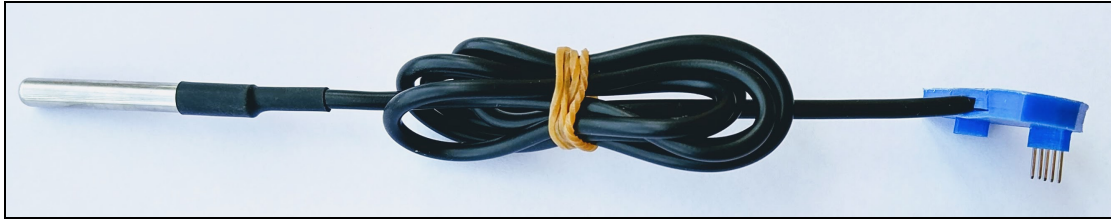
The **ES-DS18** comes pre-assembled and tested. It consists of:

- a weatherproof temperature sensor,

- a weatherproof cable, and

- a custom expansion plug that is compatible with the SS-1CHPro interface device.

## Requirements

The SS-1CHPro requires:

- **Initial Setup**
  - A device with a Web Browser & WiFi interface, located close to the SS-1CHPro. A smart-phone, or tablet will usually be sufficient.
- **Operation**
  - A WiFi Access Point (AP) connected to the local LAN[3], within the WiFi Range[4] of the SS-1CHPro.
  - A DHCP[5] server on the LAN.
- **Ongoing Management**
  - Any device with a Web browser and connected to the same LAN as the SS-1CHPro.

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[3] Local Area Network. See https://en.wikipedia.org/wiki/Local_area_network
[4] See Specifications, page 17
[5] Dynamic Host Configuration Protocol: See
https://en.wikipedia.org/wiki/Dynamic_Host_Configuration_Protocol

## Safety Warning



**AC Power can kill.**
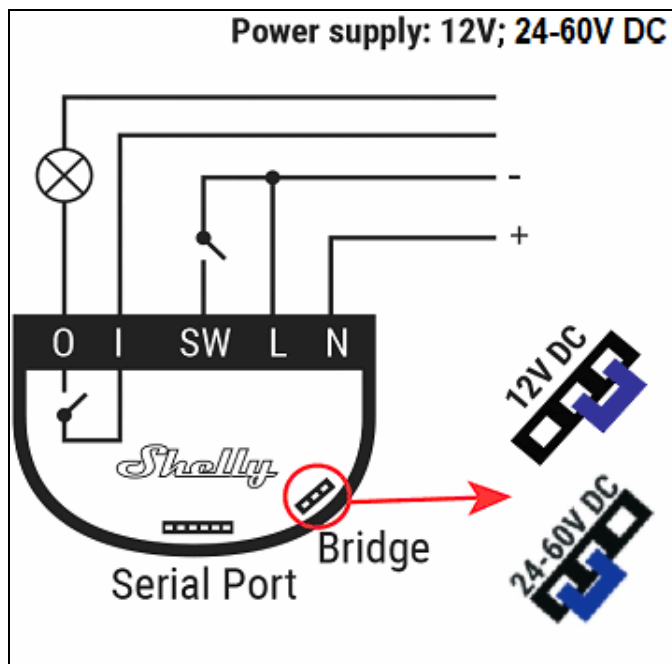
***Never*** power the **SS-1CHPro** with AC power when using this expansion sensor.

The sensor will be at AC Live voltage.

## Power and Wiring

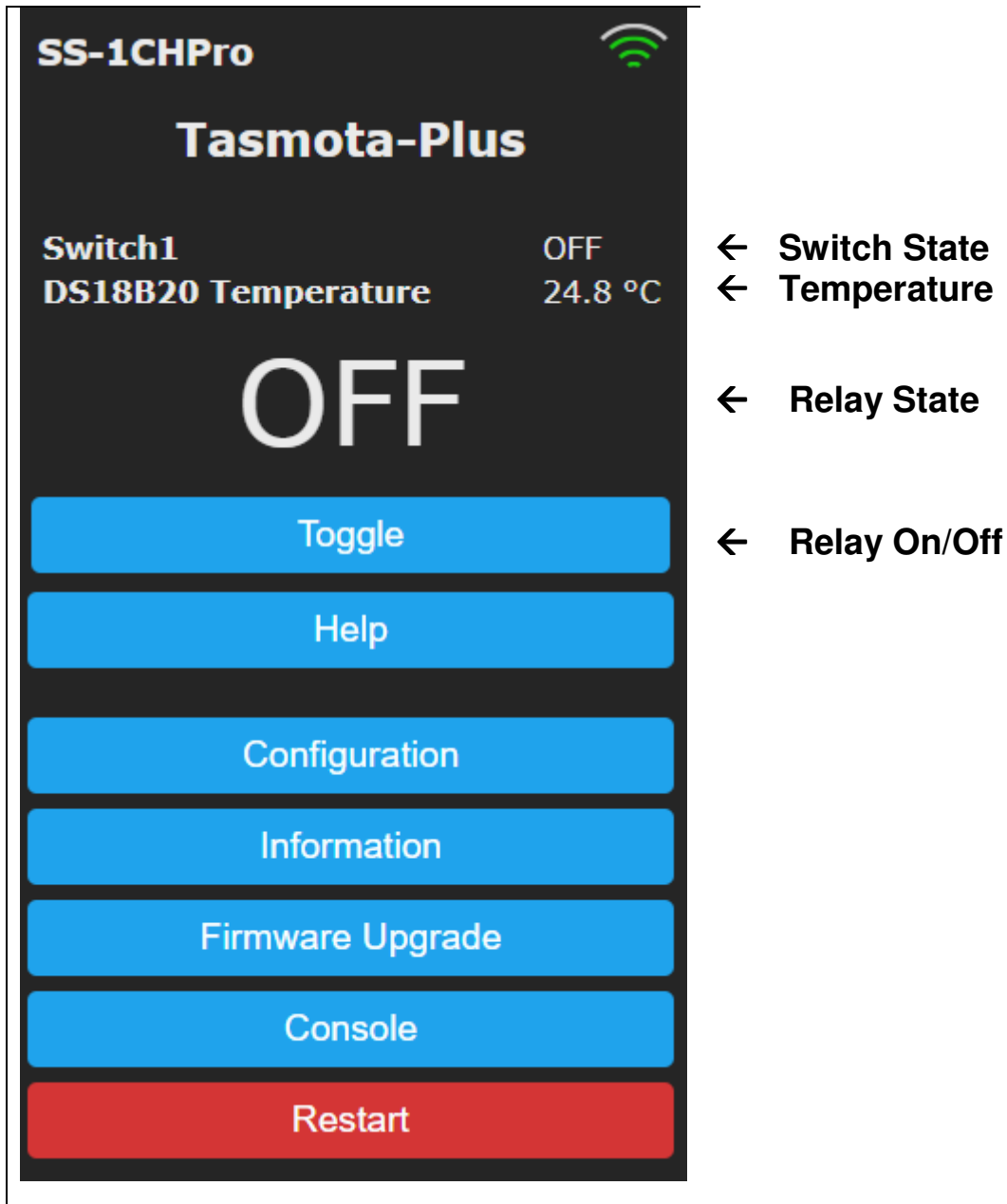The **SS-1CHPro** should be powered ONLY by a DC supply.

| | | | |
|---|---|---|---|
| Relay Terminals: | **0** | & | **I** |
| Switch Terminals: | **SW** | & | **L** |
| Power Terminals: | **L(-)** | & | **N(+)** |



**Figure 1 - Bridge Jumper**

# Web Browser Interface

| SS-1CHPro | |
| --- | --- |
| **Tasmota-Plus** | |
| Switch1 | OFF | ← **Switch State** |
| DS18B20 Temperature | 24.8 °C | ← **Temperature** |
| **OFF** | ← **Relay State** |
| Toggle | ← **Relay On/Off** |
| Help | |
| Configuration | |
| Information | |
| Firmware Upgrade | |
| Console | |
| Restart | |

**Figure 2 - The Tasmota Web Interface is available from any Web browser**

Simply use any web browser to open the web page
`http://<device.ip.address>/`

See documentation here: `https://tasmota.github.io/docs/WebUI/`

# Getting Started

1. Remove the two small covers on the top of the SS-1CHPro



2. **WARNING! Check the position of the BRIDGE jumper (See Power and Wiring, page 5) of the SS-1CHPro before applying power.**

> **Don't forget – Never power with AC voltage with the ES-DS18 connected.**
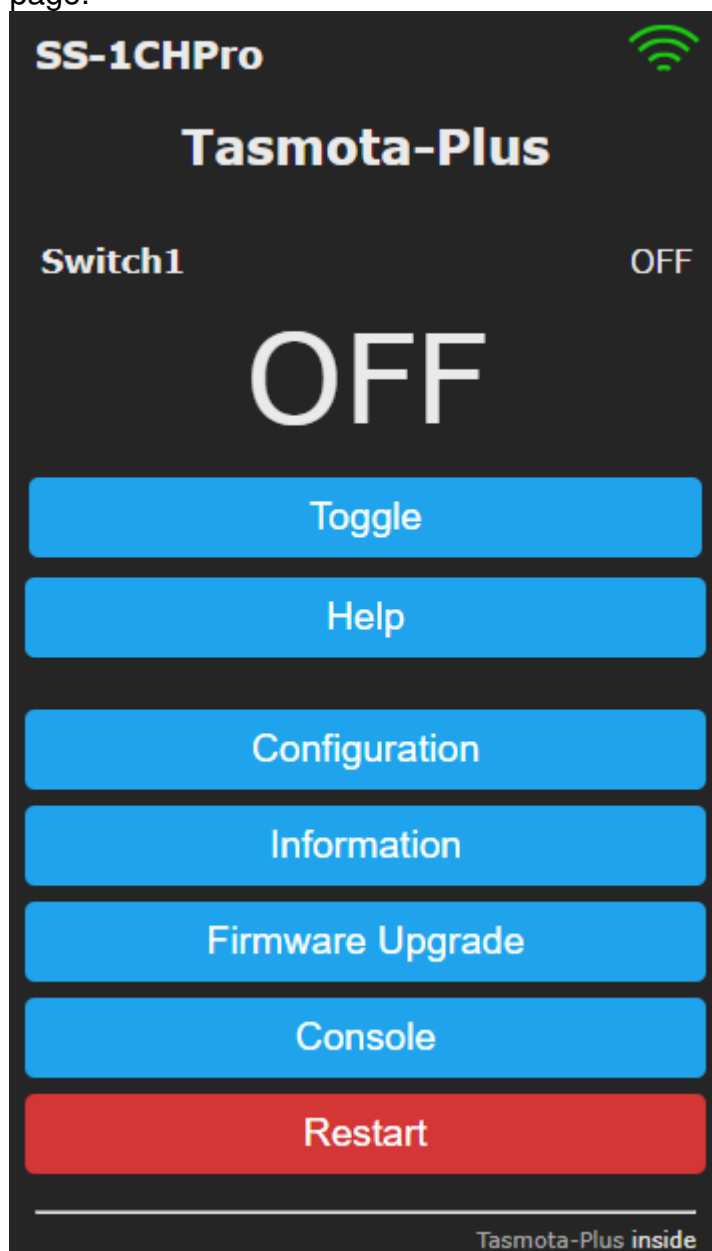
   If you need to change the BRIDGE jumper position, lever the two halves of the enclosure apart.

3. Wire your DC power supply to the screw terminals:
   DC +  to  **N(+)**
   DC -  to  **L(-)**

4. Do not apply power yet.

5. Insert the ES-DS18 plug onto the top of the SS-1CHPro.



6. Power the ES-DS18.

7. Follow the instructions in the **SS-1CHPro User Guide**[6] until you see this page.



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[6] https://tinyurl.com/28nybtzx
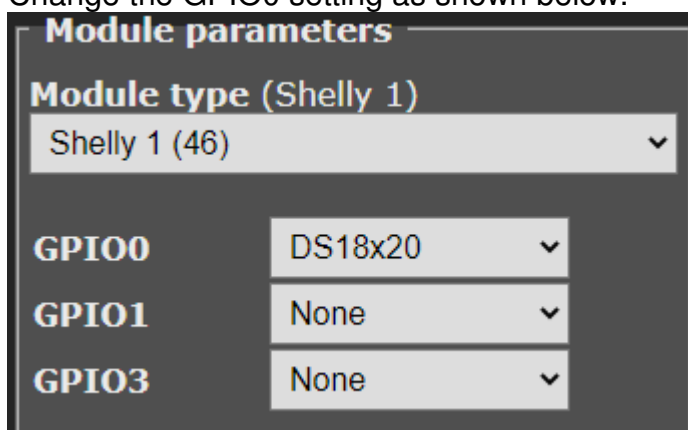
# Enabling the ES-DS18 Sensor

1. From the SS-1CHPro main page, click

   | Configuration |
   |:---:|

   then

   | Configure Module |
   |:---:|

2. Change the GPIO0 setting as shown below.

   **Module parameters**

   **Module type** (Shelly 1)

   Shelly 1 (46)

   | GPIO0 | DS18x20 |
   | GPIO1 | None |
   | GPIO3 | None |

3. Click

   | Save |
   |:---:|

   then

   | Main Menu |
   |:---:|

4. You should now see

   **SS-1CHPro**

   **Tasmota-Plus**

   | Switch1 | OFF |
   | DS18B20 Temperature | 24.1 °C |

   OFF
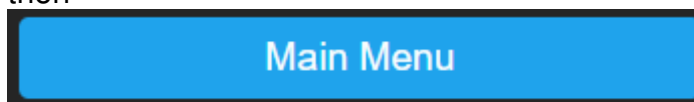
# Relay Control based on Temperature

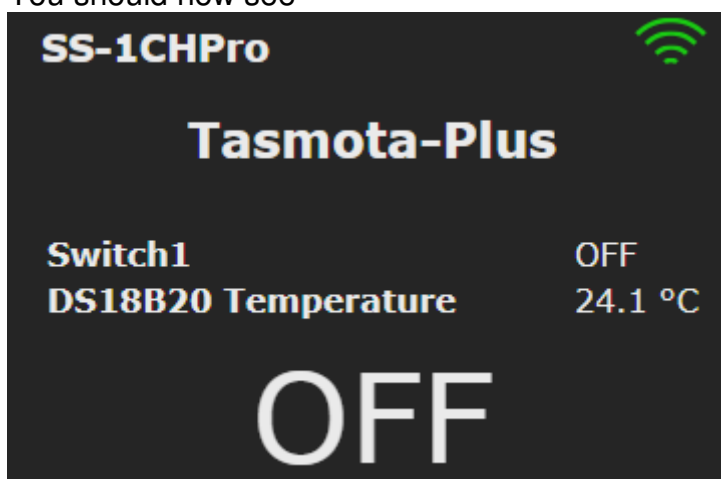Using the Tasmota Rules[7] feature, the relay can be controlled by temperature.
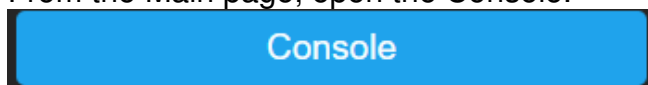
This is done by setting two values:
- Relay ON   set-point temperature
- Relay OFF set-point temperature

Note: Do not set these two values the same, as the relay may switch ON/OFF rapidly.

In the steps below you will define 3 *Rules*. These rules remain active after a reboot or power cycle.

**Step 1 – Common Configuration**

From the Main page, open the Console.



Enter these 2 commands, followed by the [Enter] key on your keyboard.

```
RULE2 ON system#boot DO BACKLOG VAR3 %VAR1%; VAR4 %VAR2%
ENDON
```

```
BACKLOG RULE1 ON;  RULE2 ON;  RULE3 ON
```

Continue to next page.

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[7] https://tasmota.github.io/docs/Rules/

Two cases are given below. Follow Step 2a or Step 2b:

**Step-2a – Relay ON when Temperature is HIGH**

Enter these 2 commands, followed by the [Enter] key on your keyboard.

```
RULE3 ON DS18B20#temperature>%VAR4% DO BACKLOG POWER1 ON;
VAR4 1000; VAR3 %VAR1% ENDON
RULE3 + ON DS18B20#temperature<%VAR3% DO BACKLOG POWER1
OFF; VAR3 -1000; VAR4 %VAR2% ENDON
```

**Step-2b – Relay ON when Temperature is LOW**

Enter these 2 commands, followed by the [Enter] key on your keyboard.

```
RULE3 ON DS18B20#temperature>%VAR4% DO BACKLOG POWER1
OFF; VAR4 1000; VAR3 %VAR1% ENDON
RULE3 + ON DS18B20#temperature<%VAR3% DO BACKLOG POWER1
ON; VAR3 -1000; VAR4 %VAR2% ENDON
```

**Step 3 – Changing the Set-point Temperatures**

The set-point temperatures are set in RULE1.

| VAR2 must be higher than VAR1 |
| --- |

To change the set-point temperatures to (e.g.) 21 & 22 , enter these 2 commands, followed by the [Enter] key on your keyboard.

```
RULE1 ON system#init DO BACKLOG VAR1 21; VAR2 22 ENDON
RESTART 1
```

## http:// Command Interface



Simple commands as below will (e.g.) turn the Relay ON.

> **Note: %20** in a URL = Space character

**From Web Browser**
```
http://<device.ip.address>/cm?cmnd=power1%20on
```

**From Windows or Linux command/terminal window**
```
curl http://<device.ip.address>/cm?cmnd=power1%20on
```

**From a Windows Batch file (*.bat file)**
```
curl http://<device.ip.address>/cm?cmnd=power1%%20on
```

> **Note**: need double **%** characters if in a batch file

**From a PHP script (*.php file)**
```
file_get_contents(
 'http://<device.ip.address>/cm?cmnd=power1%20on');
```

You can retrieve the **Switch and Temperature Status** as below.
```
http://<device.ip.address>/cm?cmnd=status%208
```
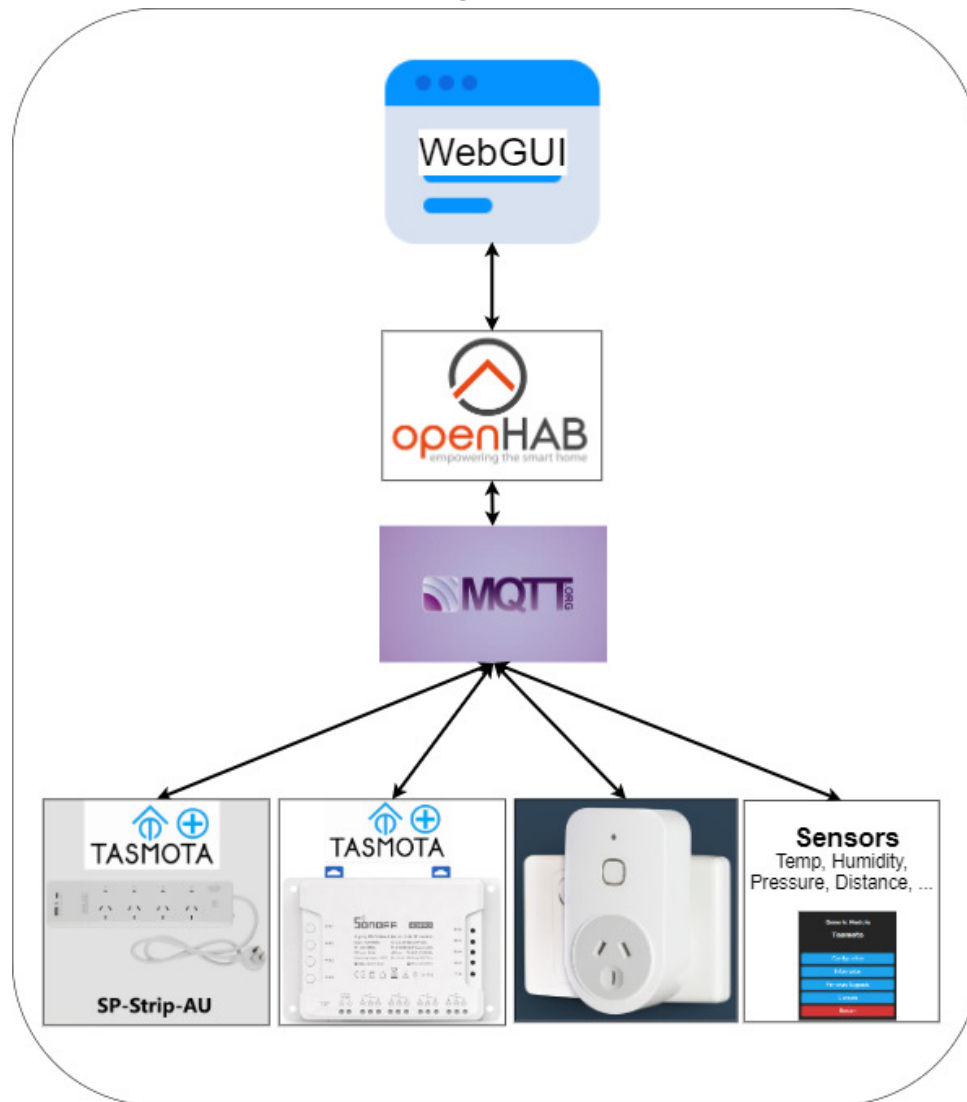
A typical JSON response looks like:
```
{
   "StatusSNS":{
      "Time":"2021-01-18T02:06:53",
      "Switch1":"OFF",
      "DS18B20":{
         "Id":"011937A99651",
         "Temperature":24.4
      },
      "TempUnit":"C"
   }
}
```

**More information:**
https://tasmota.github.io/docs/Commands/#management

# Centralised Monitoring & Control



While this device can operate 100% stand-alone, it can also be monitored and controlled, along with multiple other devices, from a single management platform.

One popular management platform is **openHAB**[8].

In simple terms:

- MQTT compatible devices (e.g. Tasmota) connect to an **MQTT Broker**[9] .
  Status information sent TO the MQTT broker.
  Commands received FROM the MQTT broker.

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[8] https://www.openhab.org/    (Freeware, Open source)
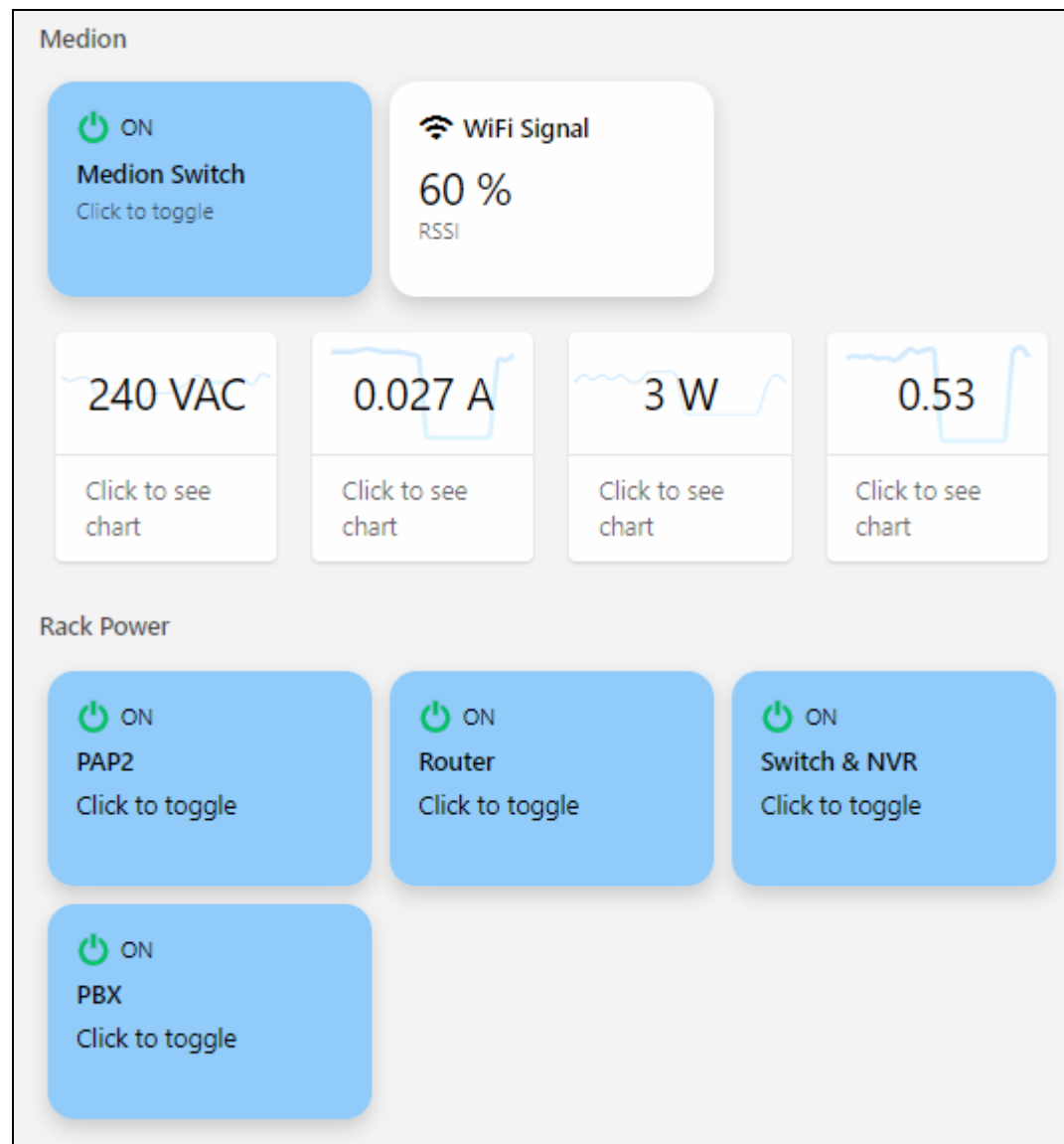
[9] https://mqtt.org/                (Freeware, Open source)

- **openHAB** also connects to the MQTT broker.
  Status information received FROM the MQTT broker.
  Commands sent TO the MQTT broker.

- Users interact via web pages (WebGUI)

## WebGUI Interfaces

openHAB supports a number of User Interfaces (UIs). Each UI is highly customisable.

The images below show example visualisations.



**Figure 3 - Classic UI. Mobile friendly.**

**Figure 4 - Basic UI. Mobile friendly.**



**Figure 5 - Panel UI. Ideal for touch screens.**

## openHAB Channel Definition (Example)

Below is shown the channel definition for an ES-DS18/SS-1CHPro correctly integrated into openHAB.

Values that will be different for each installation have been replaced with XXXXXX.

```
UID: mqtt:topic:XXXXXX
label: ES-DS18
thingTypeUID: mqtt:topic
configuration:
  payloadNotAvailable: Offline
  availabilityTopic: tele/tasmota_XXXXXX/LWT
  payloadAvailable: Online
bridgeUID: mqtt:broker:30e6c58453
channels:
  - id: Temp
    channelTypeUID: mqtt:number
    label: Temp
    description: null
    configuration:
      stateTopic: tele/tasmota_XXXXXX/SENSOR
      transformationPattern: JSONPATH:$.DS18B20.Temperature
      unit: C
  - id: Relay
    channelTypeUID: mqtt:switch
    label: Relay
    description: ""
    configuration:
      commandTopic: cmnd/tasmota_XXXXXX/POWER
      stateTopic: stat/tasmota_XXXXXX/POWER
      off: OFF
      on: ON
```

## Specifications

| Temperature sensor | Type: | DS18B20 |
|---|---|---|
| | Range | -55 ℃ to +125 ℃ |
| | ±0.5 ℃ Accuracy | -10 ℃ to +85 ℃ |
| | Weatherproof | Yes |
| | Length | 50 mm |
| | Diameter | 6 mm  (6.5 mm over black jacket) |
| **Cable** | Length | 900 mm |
| | Diameter | 3.7 mm |
| **Connector** | Mates with | **SS-1CHPro**[10] |
| **Power supply options for the SS-1CHPro** | DC Only | 12       V DC (regulated), or 24 to 60 V DC (unregulated) |

[10] https://ubwh.com.au/SS-1CHPro