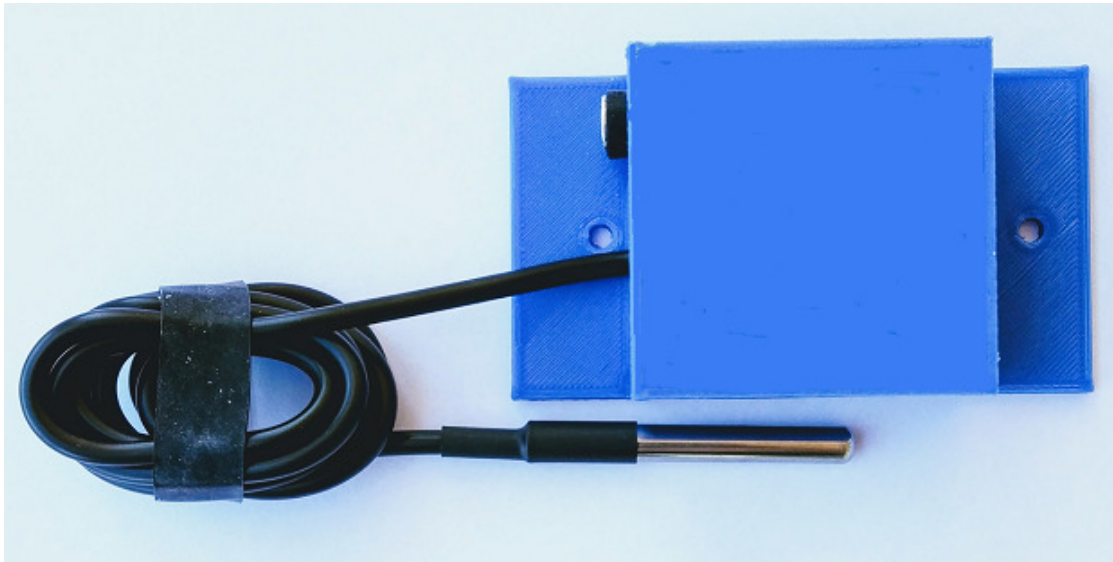




# Tasmota-Plus Smart Gauge - Thermostat



## SG-TEMP User Guide

V20210524

Latest Version of this document available at:

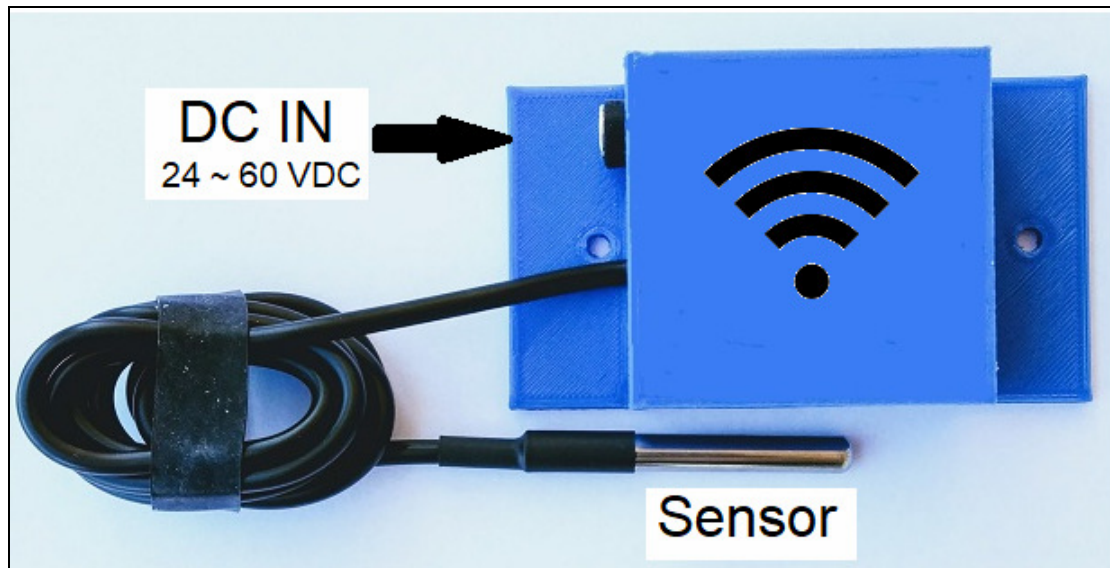
<https://github.com/UBWH/ubwh.github.io/blob/master/assets/UserGuides>

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## Introduction

The SG-TEMP is a Temperature sensor with a smart WiFi interface.



Features include:

<b>Temperature monitoring</b>	Real-time temperatures can be viewed locally, or from anywhere in the world, accessible by any web browser.
<b>Temperature logging</b>	When combined with an openHAB/MQTT <sup>1</sup> server, current and past temperatures are accessible locally, or from anywhere in the world, accessible by any web browser.
<b>Flexible DC power supply</b>	This device is powered by un-regulated DC. (Power supply not included)  Voltages between 24 and 60 VDC can be used.
<b>Relay Manual or Automatic control</b>	A SPST <sup>2</sup> relay (16 A / 240 V) is included, which can be temperature controlled (ON/OFF).  For example: a Fan or Heater could be turned on/off as the temperature passes user-defined set-points.
<b>External switch monitoring</b>	A user-supplied, external switch can be connected and monitored; i.e. Open or Closed.

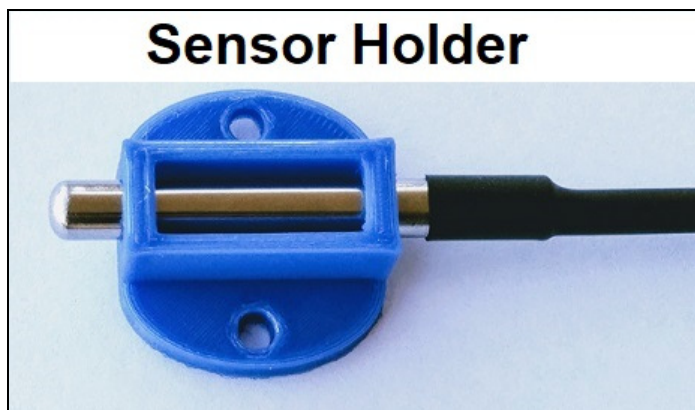
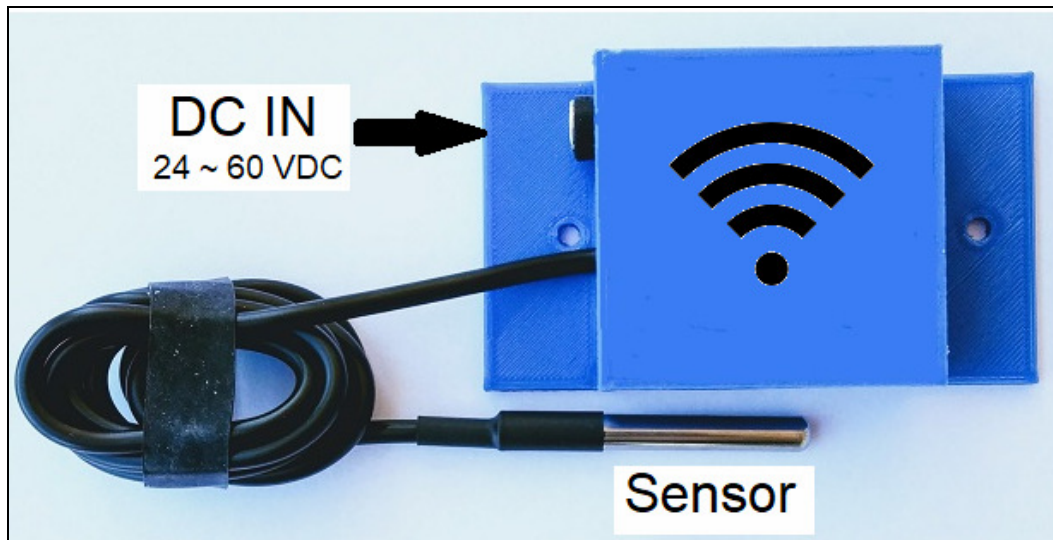
**Table 1 – Available Features**

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<sup>1</sup> <https://openhab.org> & <https://mqtt.org>

<sup>2</sup> Single Pole, Single Throw

## Hardware



The **SG-TEMP** comes pre-assembled and tested. It consists of:

- a waterproof temperature sensor,
- a waterproof cable,
- a wall-mount enclosure with built-in SS-1CHPro<sup>3</sup> smart WiFi interface, and
- a bonus wall mount sensor holder.

### ***Accessing the Relay and Switch Terminals***

Gently pry off the enclosure cover with a small, flat-bladed screwdriver inserted from the base.

Consult the SS-1CHPro User Guide for details:

<https://tinyurl.com/28nybtzx>

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<sup>3</sup> <https://ubwh.com.au/SS-1CHPro>

# Requirements

The SG-TEMP requires:

- **Initial Setup**
  - A device with a Web Browser & WiFi interface, located close to the SG-TEMP. A smart-phone, or tablet will usually be sufficient.
- **Operation**
  - A WiFi Access Point (AP) connected to the local LAN<sup>4</sup>, within the WiFi Range<sup>5</sup> of the SG-TEMP.
  - A DHCP<sup>6</sup> server on the LAN.
- **Ongoing Management**
  - Any device with a Web browser and connected to the same LAN as the SG-TEMP.

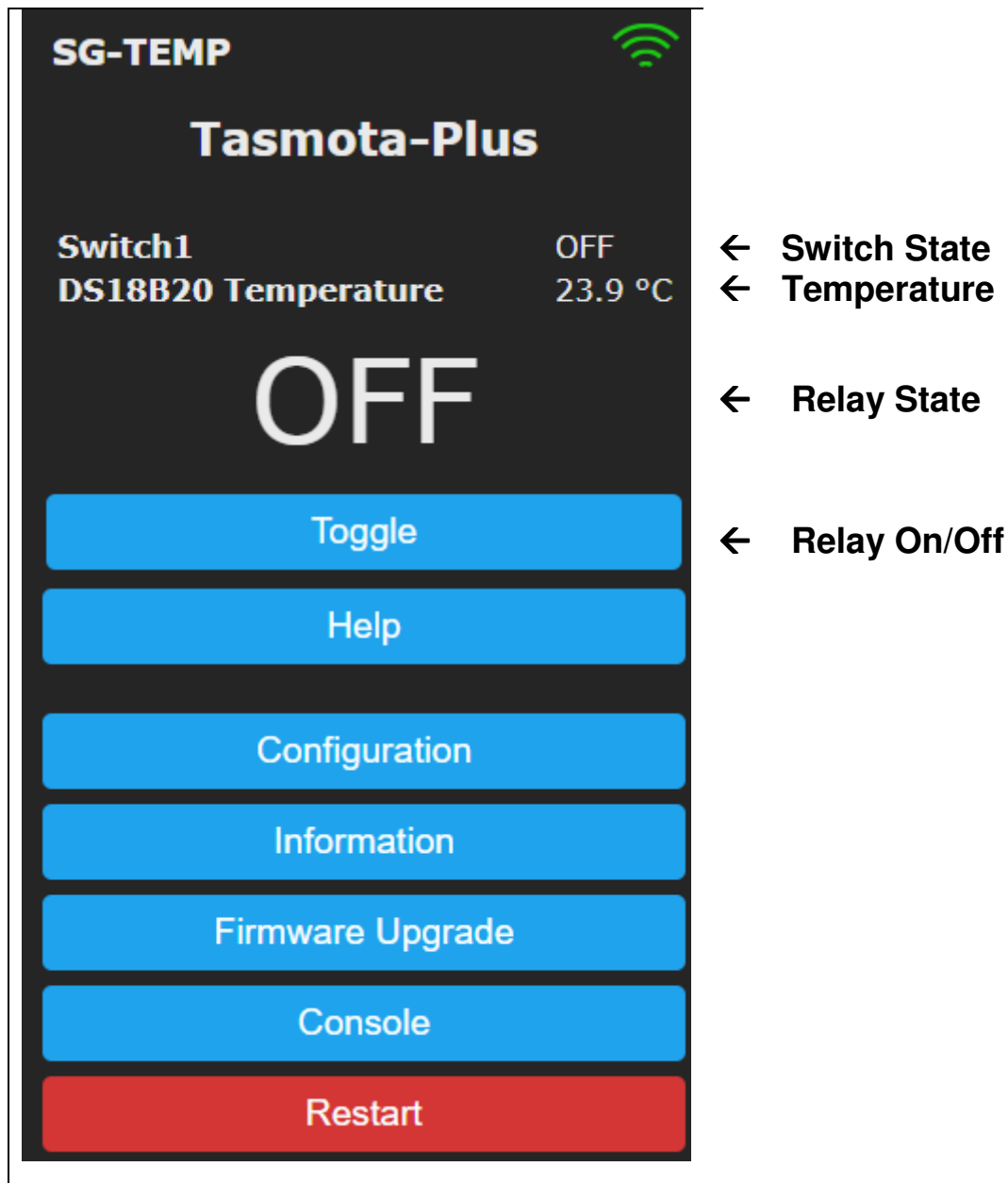
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<sup>4</sup> Local Area Network. See [https://en.wikipedia.org/wiki/Local\\_area\\_network](https://en.wikipedia.org/wiki/Local_area_network)

<sup>5</sup> See Specifications, page 19

<sup>6</sup> Dynamic Host Configuration Protocol: See [https://en.wikipedia.org/wiki/Dynamic\\_Host\\_Configuration\\_Protocol](https://en.wikipedia.org/wiki/Dynamic_Host_Configuration_Protocol)

## Web Browser Interface



**Figure 1 - 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/>

## Power Options

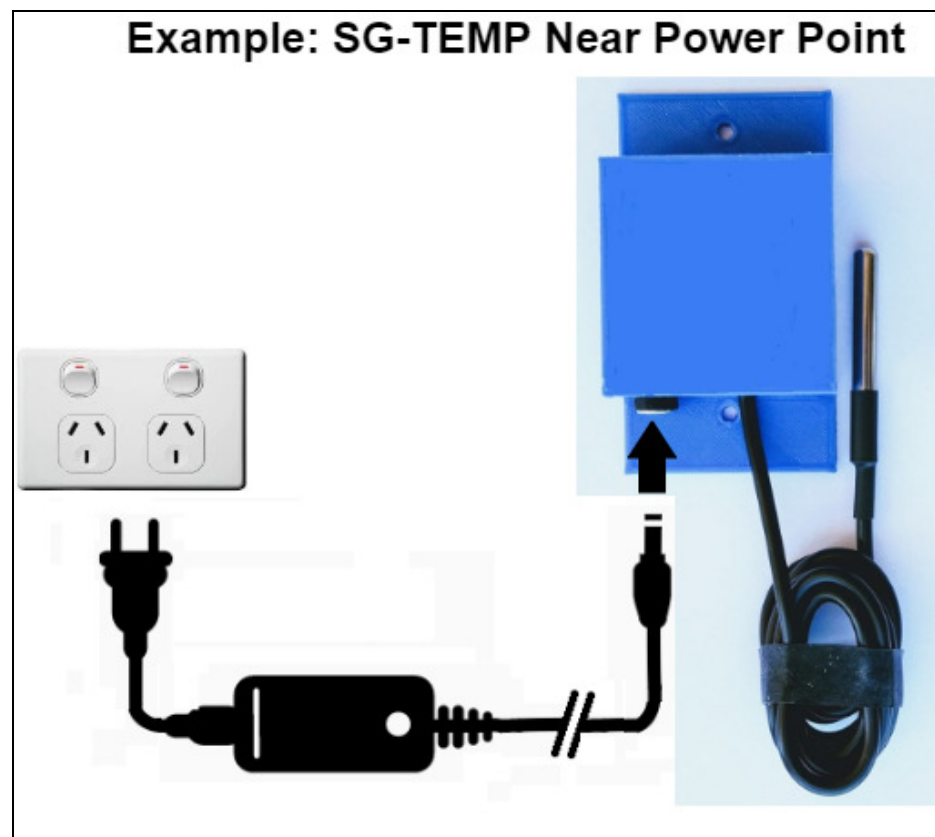
The DC-IN port is a common 2.1mm x 10 mm , centre-positive jack.

There are two common installation scenarios:

### ***Near a Power Point (GPO)***

In this case, simply use any DC power supply between 24 and 60V that has a suitable DC plug.

Example suitable power supply: <https://ubwh.com.au/PSU-24VDC-24W>



**Figure 2 – Powering the SG-TEMP from a nearby power point**

### ***Far from a Power Point (GPO)***

In this case, one recommendation is to use a common passive PoE<sup>7</sup> power supply that provides either 24 or 48 VDC, with widely available LAN<sup>8</sup> cable.

One end of the LAN cable can be terminated with either a:

- **DC Plug**, soldered onto the conductors carrying the PoE voltage, or
- **RJ45 LAN plug**, with a PoE Splitter<sup>9</sup> to break out the DC to a 2.1mm plug.

Example suitable power supplies:

<https://ubwh.com.au/POE-24-12W>

<https://ubwh.com.au/POE-48-24W>

<https://ubwh.com.au/WI-PS306GF-UPS-V2>



**Figure 3 – Powering the SG-TEMP over distance with passive PoE**

<sup>7</sup> Power-Over-Ethernet

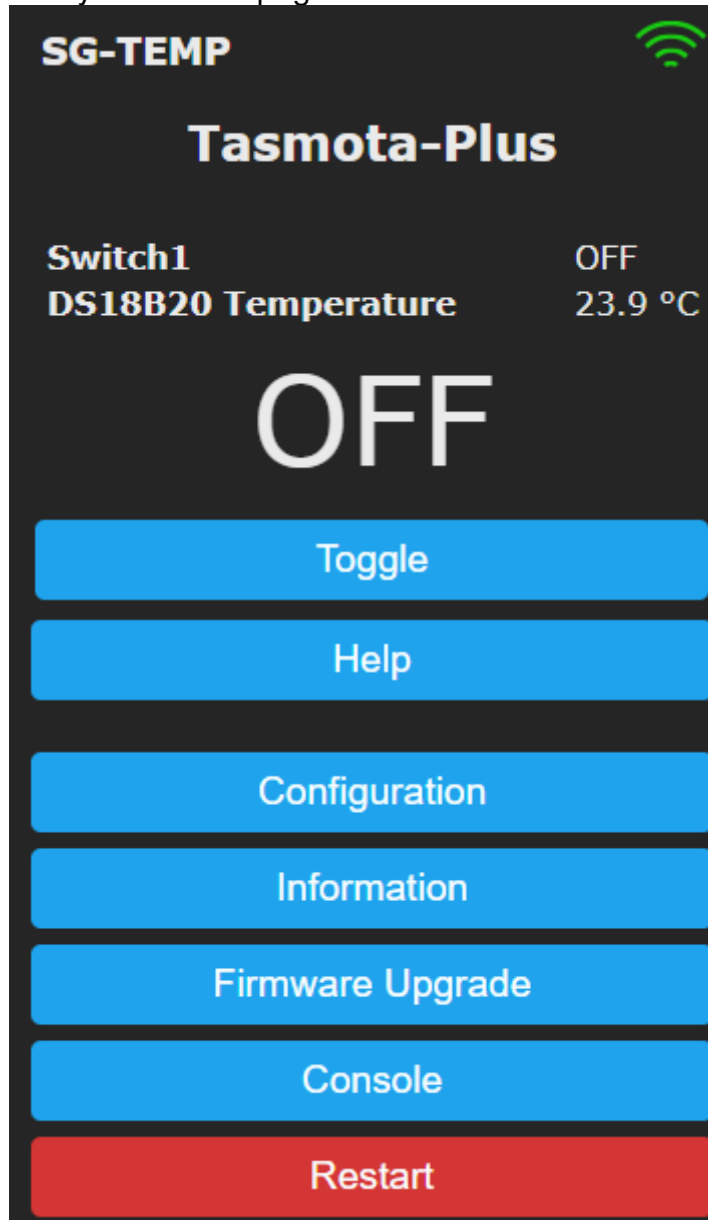
<sup>8</sup> e.g. CAT5e

<sup>9</sup> e.g. <https://ubwh.com.au/POE-P-SPLIT>



## Getting Started

1. Power the SG-TEMP.
2. Follow the **Getting Started** instructions in the **SS-1CHPro User Guide**<sup>10</sup> until you see this page.



## Using the Web Interface

See the **SS-1CHPro User Guide**<sup>11</sup>

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<sup>10</sup> <https://tinyurl.com/28nybtzx>

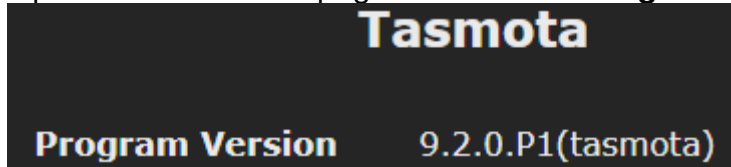
<sup>11</sup> <https://tinyurl.com/28nybtzx>

## Firmware

From time to time, new Tasmota-Plus firmware may be released for your device.

### *Checking the installed version*

Open the Information page and note the **Program Version** currently installed.



### *Checking the latest released version*

Use your web browser to visit:

<http://ubwh.com.au/tasmota/Tasmota-Plus/SG-TEMP-ReleaseNotes.php>

## Updating

If you choose to update the firmware to the latest version, there are two methods.

### **Over The Air (OTA)**

This is the simplest.

Open the Firmware Upgrade page.

Enter this OTA Url:

<http://ubwh.com.au/tasmota/Tasmota-Plus/tasmota-SG-TEMP.bin.gz>

Click **Start upgrade**

A screenshot of the "Upgrade by web server" form. It has a title "Upgrade by web server" and a label "OTA Url". Below the label is a text input field containing the URL "http://ubwh.com.au/tasmota/Tasmota-Plus". At the bottom of the form is a blue button labeled "Start upgrade".

### **File Upload**

With a web browser on your local PC, visit

<http://ubwh.com.au/tasmota/Tasmota-Plus/tasmota-SG-TEMP.bin.gz>

Save the file on your local computer.

Open the Firmware Upgrade page.

Choose the file just downloaded.

Click **Start upgrade**

A screenshot of the "Upgrade by file upload" form. It has a title "Upgrade by file upload" and a label "Choose file". Below the label is a text input field containing "No file chosen". At the bottom of the form is a blue button labeled "Start upgrade".

## Factory Reset Procedure

See the *SS-1CHPro User Guide*<sup>12</sup>

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<sup>12</sup> <https://tinyurl.com/28nybtzx>

# Relay Control based on Temperature - Thermostat

Open the SG-TEMP main page and navigate to **Configuration** → **Configure Thermostat**.

Set the **Above** and **Below** trigger temperatures, and select the Relay action when these triggers occur.

### Configure Thermostat

Configure Thermostat

☒ Enable?

When Temp is ...

Above

Between

Below

°C

25

24

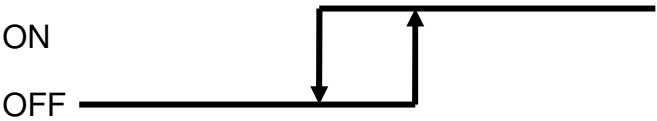
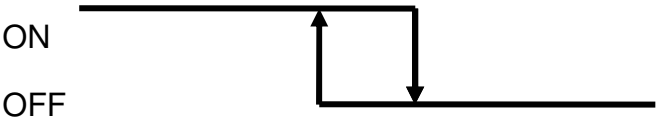

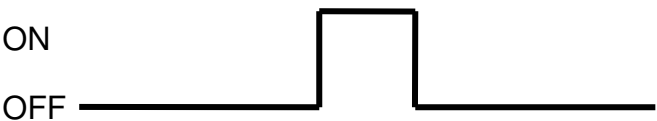
turn Relay ...

☒ ON ☐ OFF

No change

☐ ON ☒ OFF

Save

Above Action	Below Action	Relay behaviour	
		Temp Below	Temp Above
ON	OFF		
OFF	ON		
ON	ON		
OFF	OFF		

## 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`

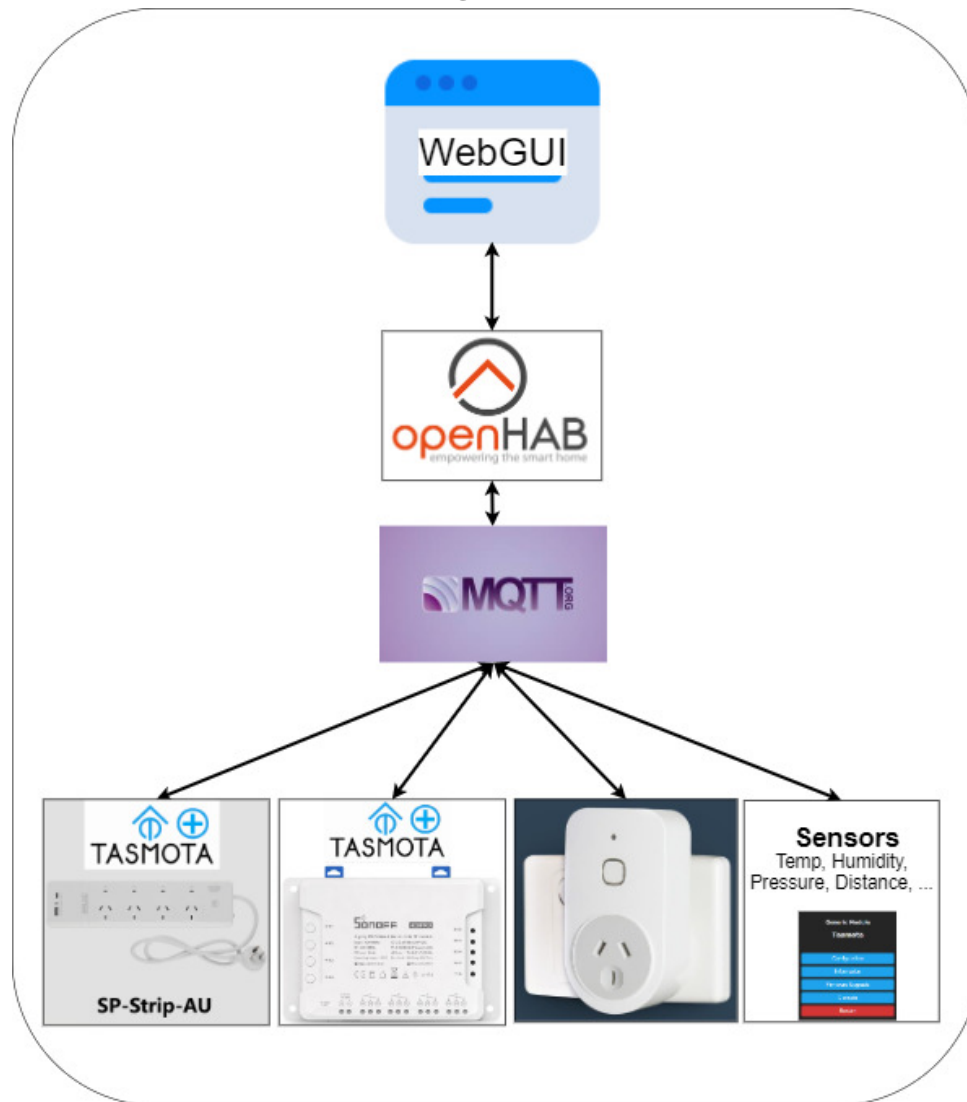
A typical JSON response looks like:

```
{  
    "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**<sup>13</sup>.

In simple terms:

- MQTT compatible devices (e.g. Tasmota) connect to an **MQTT Broker**<sup>14</sup>.  
Status information sent TO the MQTT broker.  
Commands received FROM the MQTT broker.

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<sup>13</sup> <https://www.openhab.org/> (Freeware, Open source)

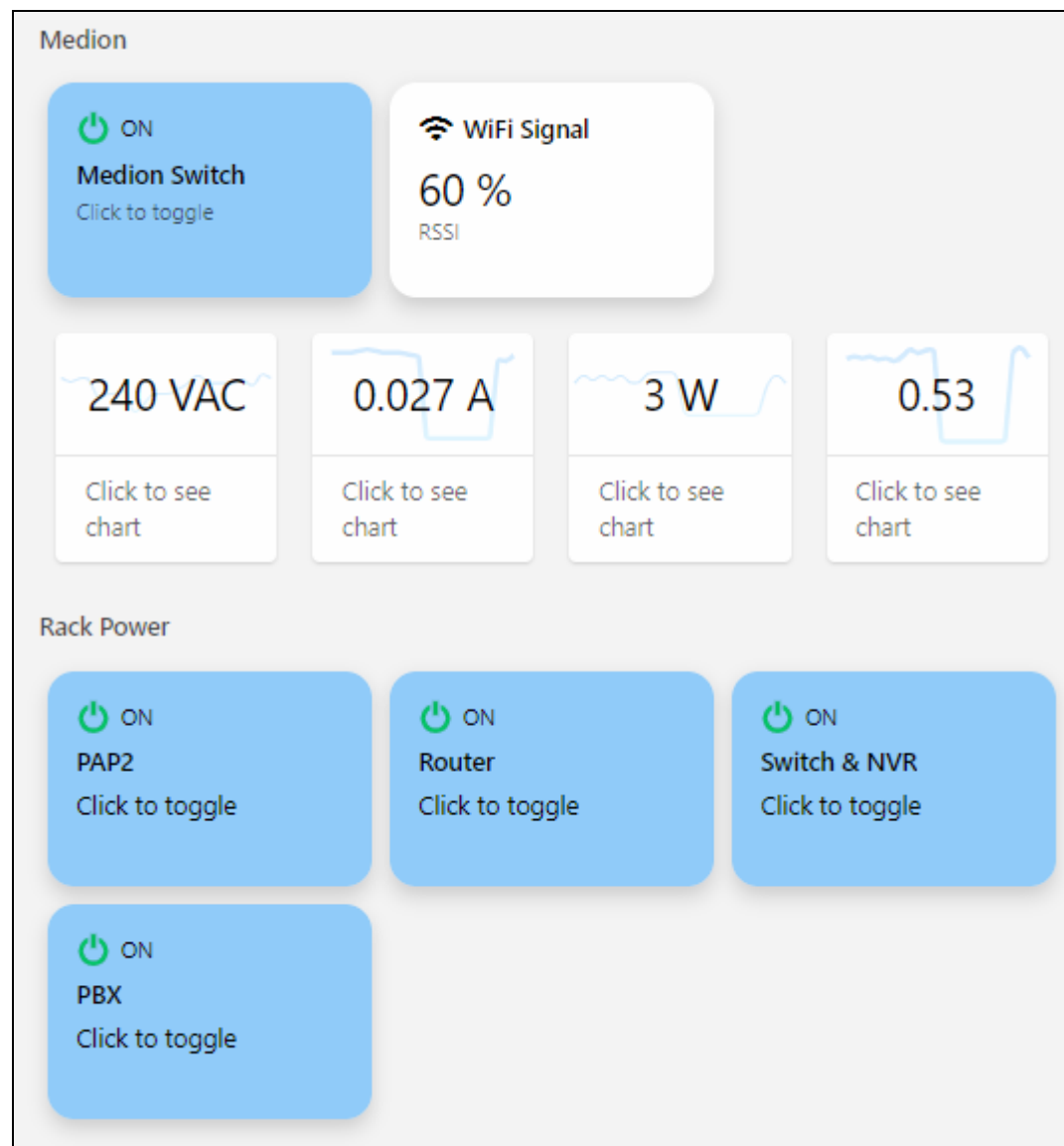
<sup>14</sup> <https://mqtt.org/> (Freeware, Open source)

- **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 4 - Classic UI. Mobile friendly.**



**Figure 5 - Basic UI. Mobile friendly.**



**Figure 6 - Panel UI. Ideal for touch screens.**



## openHAB Channel Definition (Example)

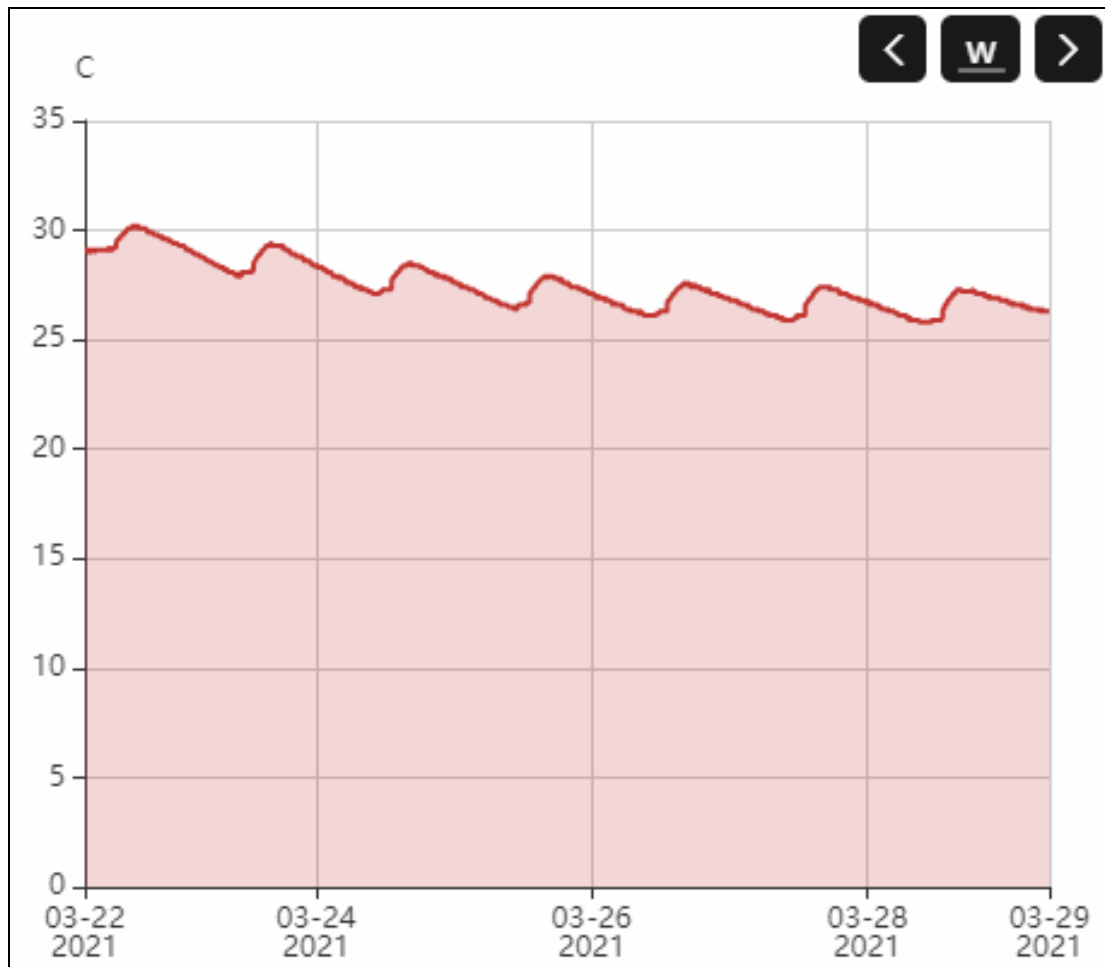
Below is shown the channel definition for an SG-TEMP correctly integrated into openHAB.

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

```
UID: mqtt:topic:XXXXXX
label: SG-TEMP
thingTypeUID: mqtt:topic
configuration:
  payloadNotAvailable: Offline
  availabilityTopic: tele/tasmota_XXXXXX/LWT
  payloadAvailable: Online
bridgeUID: mqtt:broker:xxxxxxxxx
channels:
  - id: Temp
    channelTypeUID: mqtt:number
    label: Temp
    description: null
    configuration:
      stateTopic: tele/tasmota_XXXXXX/SENSOR
      transformationPattern: JSONPATH:$.DS18B20.Temperature
      unit: C
  - id: Relay
    channelTypeUID: mqtt:switch
    label: Relay
    description: ""
    configuration:
      commandTopic: cmnd/tasmota_XXXXXX/POWER
      stateTopic: stat/tasmota_XXXXXX/POWER
      off: OFF
      on: ON
  - id: Switch
    channelTypeUID: mqtt:switch
    label: Switch
    description: ""
    configuration:
      stateTopic: tele/tasmota_XXXXXX/SENSOR
      transformationPattern: JSONPATH:$.Switch1
```

### openHAB Sample History Plot

The plot below shows an example history from an SG-TEMP sensor immersed in a water tank.



**Figure 7 - Tank water temperature over 1 week**

## Specifications

<b>Temperature sensor</b>	Type: Range $\pm 0.5$ °C Accuracy Waterproof Length Diameter	DS18B20 -55 °C to +125 °C -10 °C to +85 °C Yes (to length of cable) 50 mm 6 mm (6.5 mm over black jacket)
<b>Cable</b>	Length Diameter Waterproof	900 mm 3.7 mm Yes
<b>Enclosure</b>	Material Dimensions Weight Mounting holes	PLA 90 x 50 x 27 mm (W x L x H) 60 g (including SS-1CHPro) 2 x 3 mm dia (71 mm spacing)
<b>Power supply</b>	DC Only Connector  Power consumption	24 to 60 V DC (unregulated) 2.1 x 10 mm , Centre positive  < 1W (= 40 mA @ 24 V)
<b>WiFi</b>	Range  Standards	20 m (Typical, no walls) 10 m (Typical, walls)  802.11b/g/n 2.4 GHz