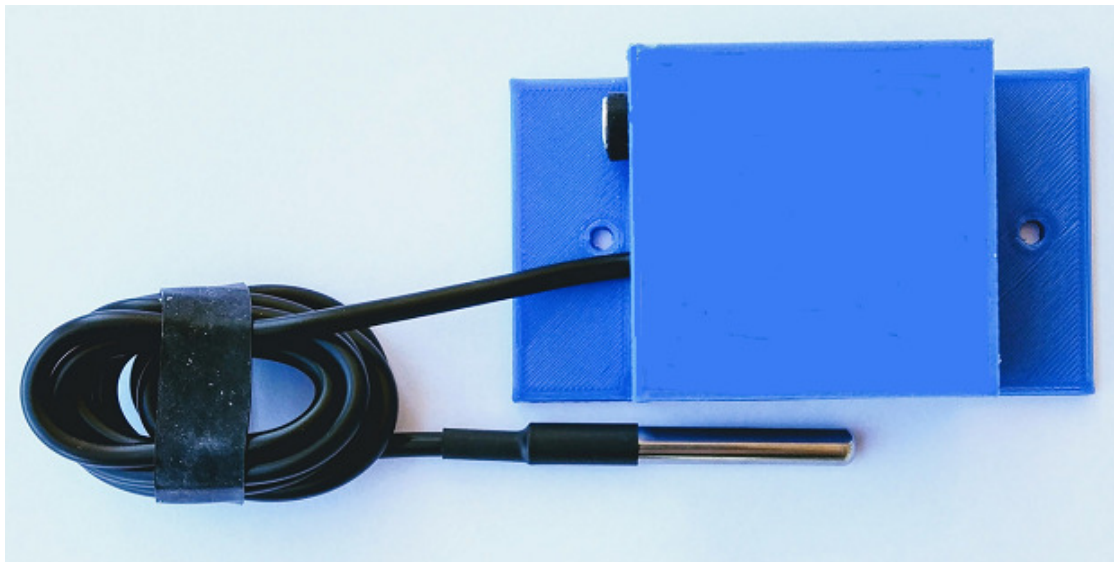




Tasmota-Plus Smart Gauge - Thermostat



SG-TEMP User Guide

V20210525

Latest Version of this document available at:

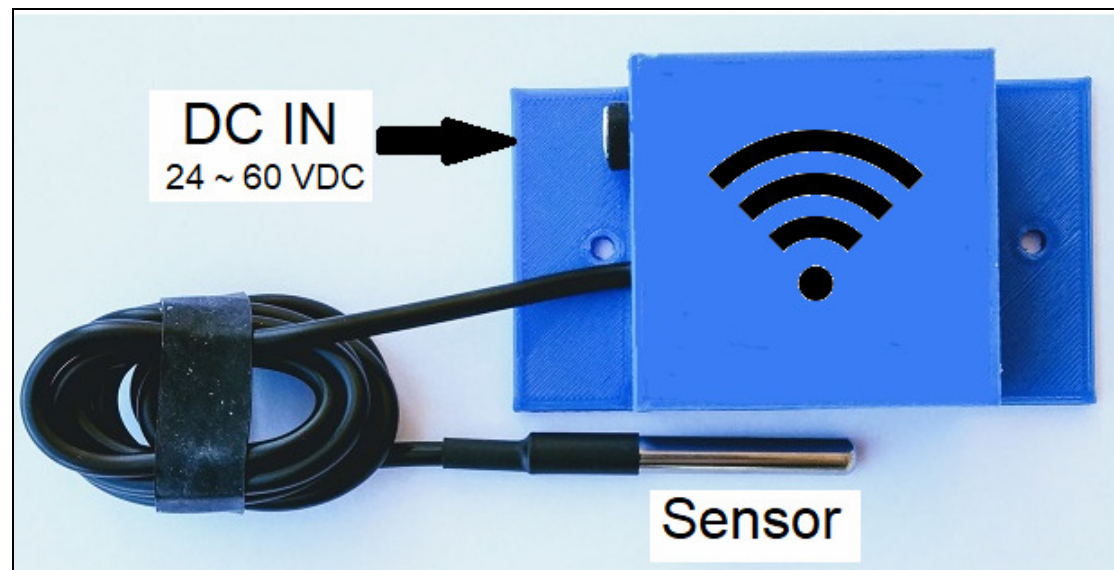
<https://github.com/UBWH/ubwh.github.io/blob/master/assets/UserGuides>

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Introduction

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



Features include:

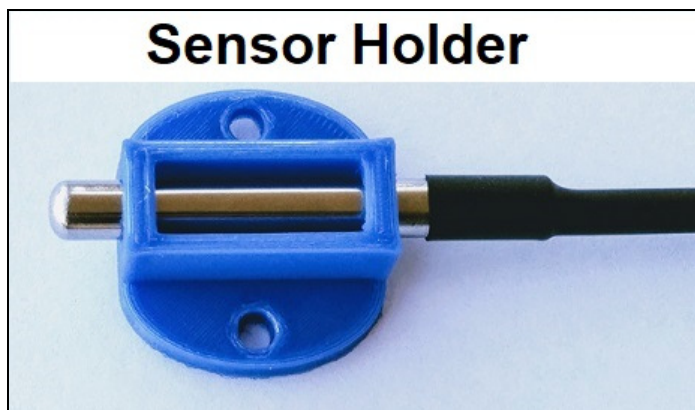
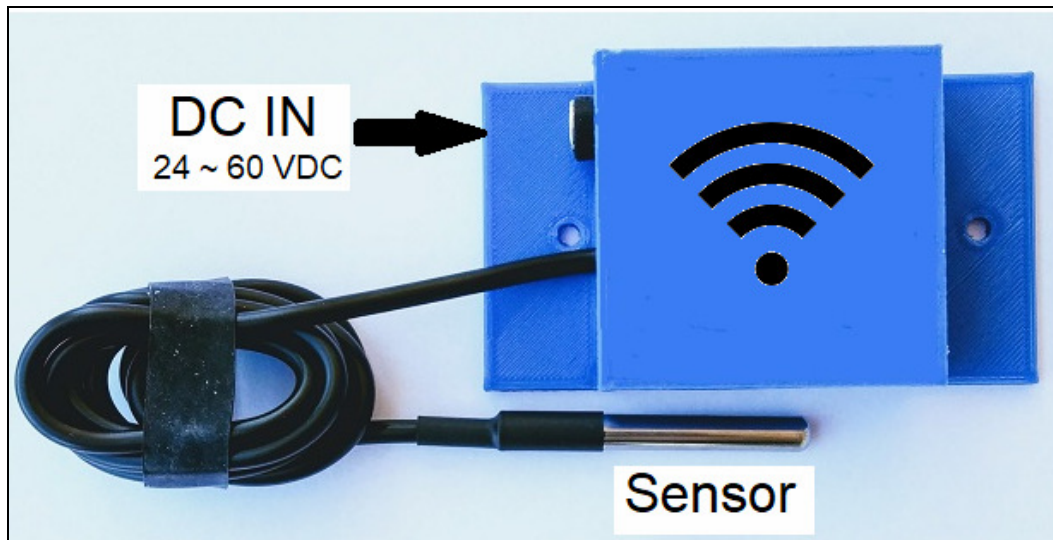
Temperature monitoring	Real-time temperatures can be viewed locally, or from anywhere in the world, accessible by any web browser.
Temperature logging	When combined with an openHAB/MQTT ¹ server, current and past temperatures are accessible locally, or from anywhere in the world, accessible by any web browser.
Flexible DC power supply	This device is powered by un-regulated DC. (Power supply not included) Voltages between 24 and 60 VDC can be used.
Relay Automatic or Manual control	A SPST ² 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. A simple external switch can also be connected that can directly control the relay.
External switch monitoring and/or control	A user-supplied, external switch can be connected and monitored; i.e. Open or Closed. This switch can control the relay if desired.

Table 1 – Available Features

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

² 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-1CHPro³ 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>

³ <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 LAN⁴, within the WiFi Range⁵ of the SG-TEMP.
 - A DHCP⁶ server on the LAN.
- **Ongoing Management**
 - Any device with a Web browser and connected to the same LAN as the SG-TEMP.

⁴ Local Area Network. See https://en.wikipedia.org/wiki/Local_area_network

⁵ See Specifications, page 19

⁶ Dynamic Host Configuration Protocol: See https://en.wikipedia.org/wiki/Dynamic_Host_Configuration_Protocol

Web Browser Interface

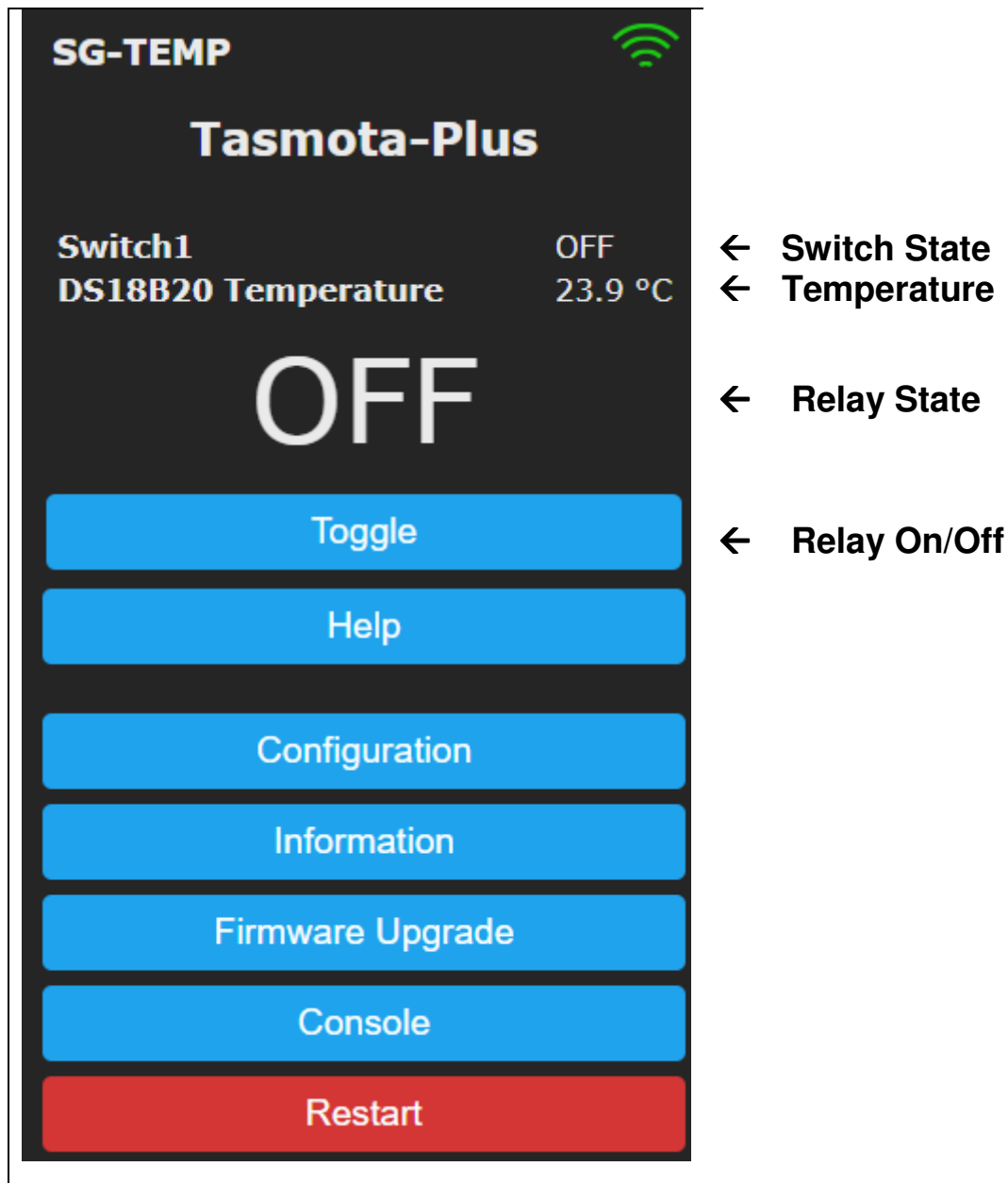


Figure 1 - The Tasmota Web Interface is available from any Web browser

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>

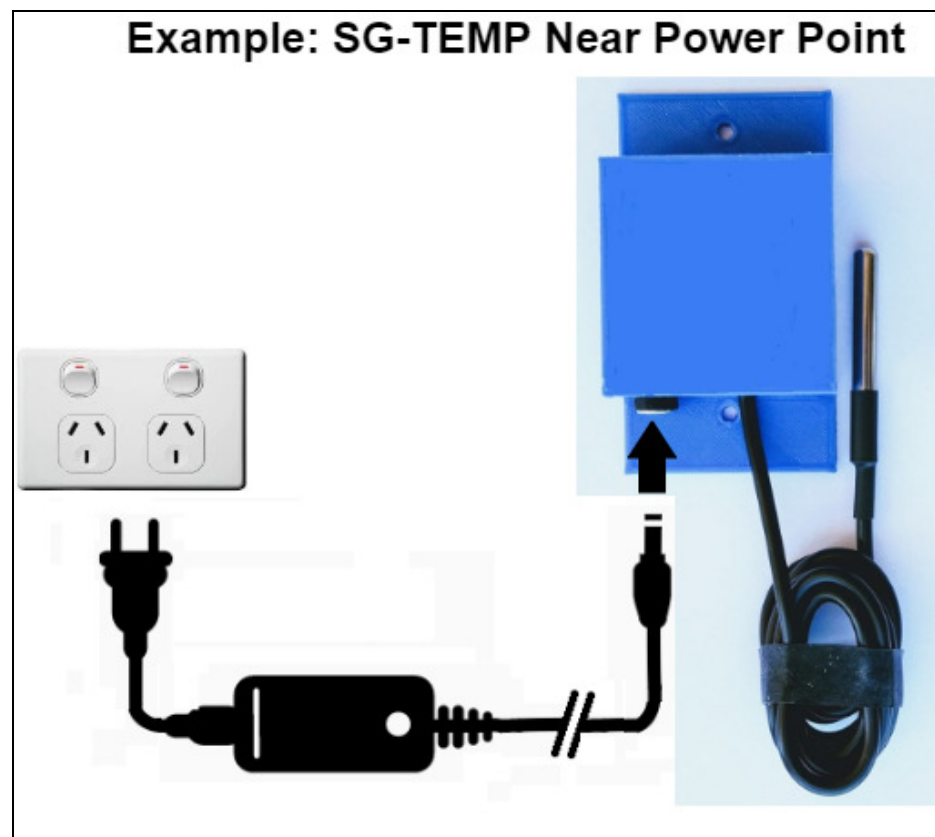


Figure 2 – Powering the SG-TEMP from a nearby power point

Far from a Power Point (GPO)

In this case, one recommendation is to use a common passive PoE⁷ power supply that provides either 24 or 48 VDC, with widely available LAN⁸ 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 Splitter⁹ 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

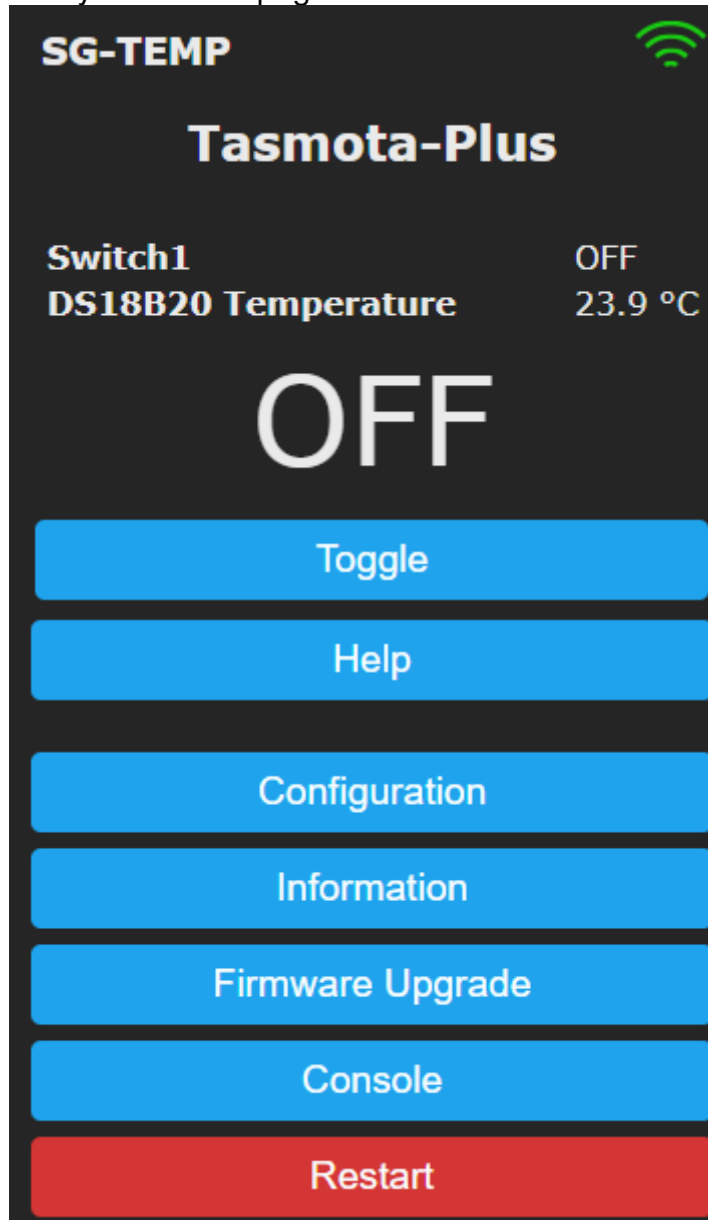
⁷ Power-Over-Ethernet

⁸ e.g. CAT5e

⁹ 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**¹⁰ until you see this page.



Using the Web Interface

See the **SS-1CHPro User Guide**¹¹

¹⁰ <https://tinyurl.com/28nybtzx>

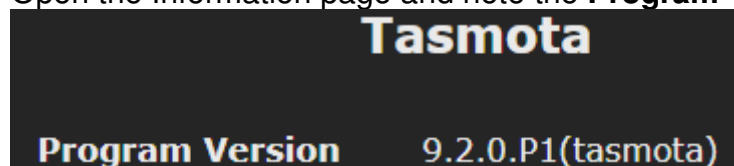
¹¹ <https://tinyurl.com/28nybtzx>

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**

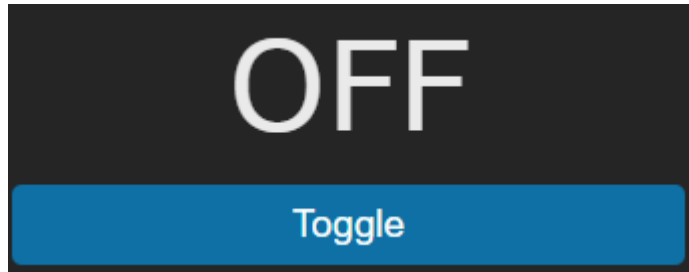
A screenshot of the "Upgrade by file upload" form. It has a title "Upgrade by file upload" and a label "Choose file". Below the label is a text input field containing "No file chosen". At the bottom of the form is a blue button labeled "Start upgrade".

Factory Reset Procedure

See the *SS-1CHPro User Guide*¹²

Relay Control by Web Interface

Simply click the toggle button on the web interface.



Relay Control by using http:// or MQTT

Use the POWER1 ON & POWER1 OFF commands.

See section [http:// Command Interface](#), page 13.

Relay Control based on External Switch

This product includes a pair of terminals that can be connected to an external switch (i.e. contacts).

The default behaviour is that the switch directly controls the relay:

Switch ON → Relay ON

Switch OFF → Relay OFF

That behaviour can be changed so that the switch position is only monitored.
See the *Relay and Switch Interaction* section in the *SS-1CHPro User Guide*¹³ for details.

¹² <https://tinyurl.com/28nybtzx>

¹³ <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?

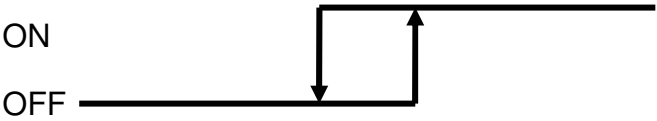
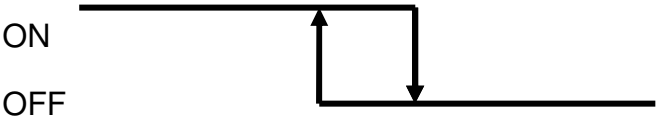

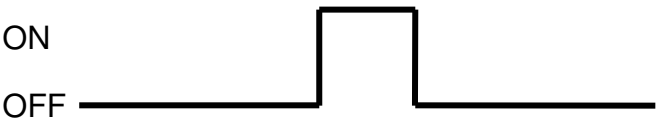
When Temp is ... °C turn Relay ...

Above25ONOFF

BetweenNo change

Below24ONOFF

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`

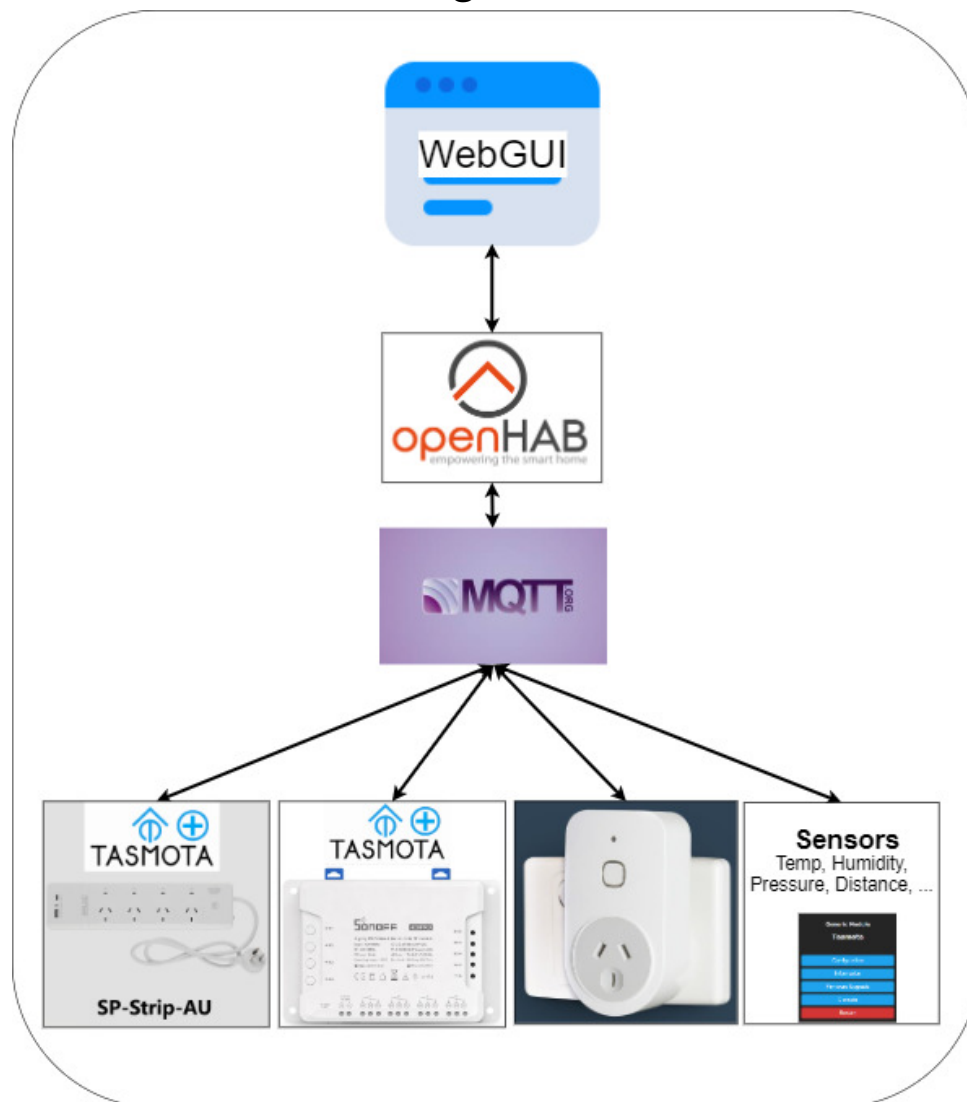
A typical JSON response looks like:

```
{  
    "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**¹⁴.

In simple terms:

- MQTT compatible devices (e.g. Tasmota) connect to an **MQTT Broker**¹⁵.
Status information sent TO the MQTT broker.
Commands received FROM the MQTT broker.

¹⁴ <https://www.openhab.org/> (Freeware, Open source)

¹⁵ <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.

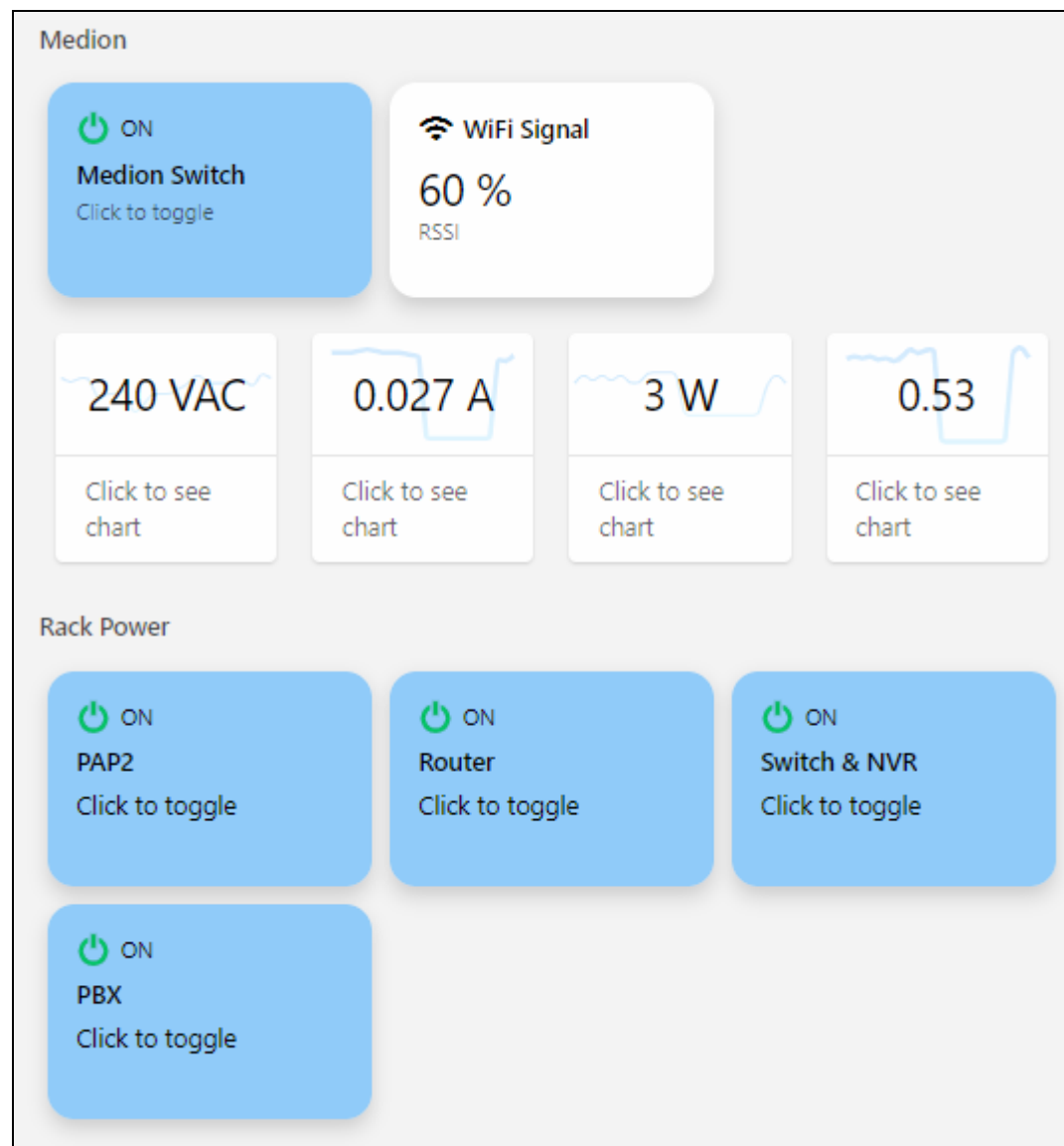


Figure 4 - Classic UI. Mobile friendly.



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.

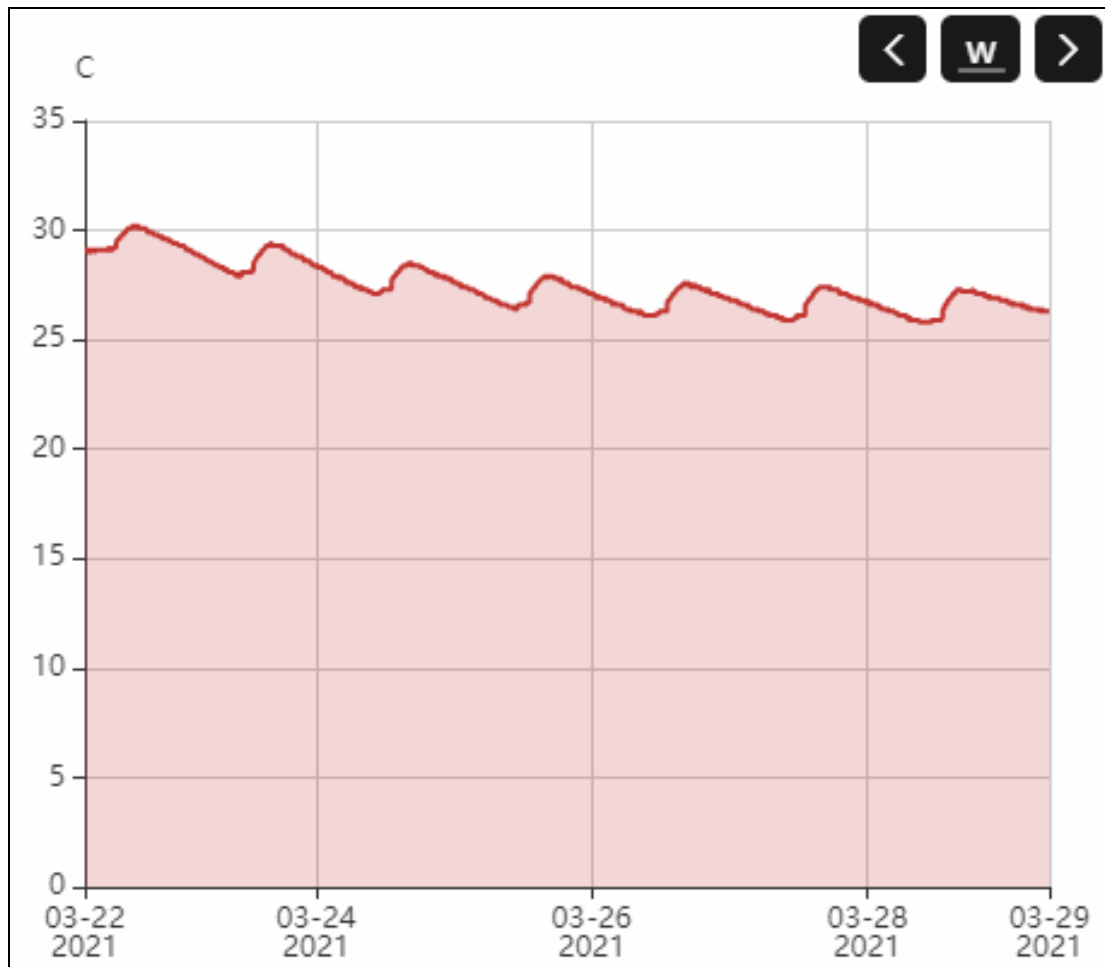


Figure 7 - Tank water temperature over 1 week

Specifications

Temperature sensor	Type: Range ± 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)
Cable	Length Diameter Waterproof	900 mm 3.7 mm Yes
Enclosure	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)
Power supply	DC Only Connector Power consumption	24 to 60 V DC (unregulated) 2.1 x 10 mm , Centre positive < 1W (= 40 mA @ 24 V)
WiFi	Range Standards	20 m (Typical, no walls) 10 m (Typical, walls) 802.11b/g/n 2.4 GHz