Sonoff S20 on HomeSeer HS3 with MQTT

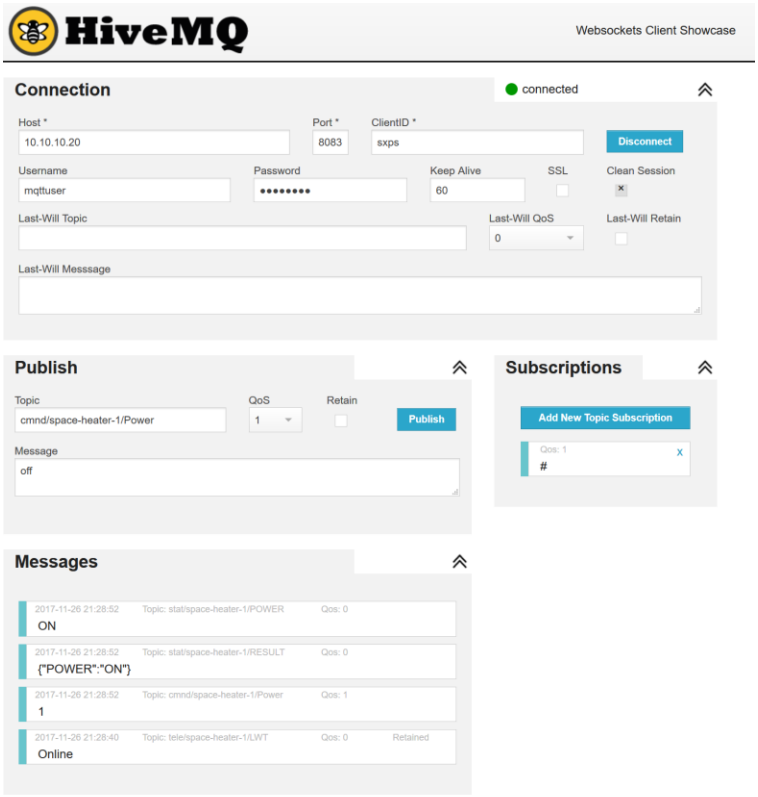
This guide is based on my experience with integrating the inexpensive but high-quality Sonoff S20 Smart Socket with HomeSeer HS3 using the mcsMQTT Plugin and the OTA Tasmota firmware. Although this guide is intended for HS3 users, Steps 1 & 2 can be followed as a generic "how-to" on setting up an MQTT Broker and flashing the S20 (or any supported Sonoff device) via WiFi.

I recommend getting yourself familiar with the basics of MQTT. A very good explanation is available here.

Step 1:

Install, configure and test an MQTT Broker.

- Mosquitto 1.4 works with the HS3 mcsMQTT Plugin and I installed it on an Ubuntu 16.04 server. Here is a guide to follow to set it up. SSL configuration is optional at this point – but you may need it later if you expose the broker to the outside world.
- Test and confirm that Publishing and Subscribing works on your broker – as shown in the guide.
- Make sure you configure Websockets on the broker. It will be useful later in troubleshooting by allowing you to use a web based MQTT client to see the messages to/from the broker. I used the open source HiveMQ websocket client.



- Also confirm that the MQTT Broker is listening on the standard (1883) and websocket (8083) ports.

```
@mqtt:~$ sudo netstat -plnt
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State       PID/Program name
tcp        0      0 0.0.0.0:1883            0.0.0.0:*               LISTEN      1208/mosquitto
tcp        0      0 0.0.0.0:8083            0.0.0.0:*               LISTEN      1208/mosquitto
tcp        0      0 0.0.0.0:22              0.0.0.0:*               LISTEN      1135/sshd
tcp6       0      0 :::1883                 :::*                    LISTEN      1208/mosquitto
tcp6       0      0 :::22                   :::*                    LISTEN      1135/sshd
```

Step 2:

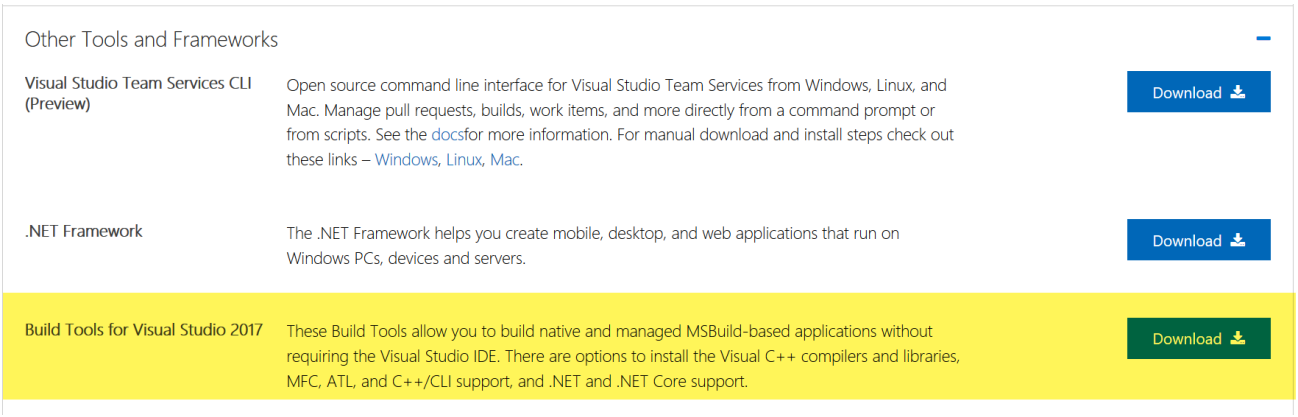
Install and configure SonOTA Tasmota firmware on the Sonoff S20.

The SonOTA script allows you to flash via WiFi the Tasmota firmware over a new "out-of-the-box stock firmware" Sonoff S20. This means that soldering a header to the PCB and using an FTDI adapter to flash the ESP8266 is not required. Obviously, if you want a firmware other than Tasmota on your Sonoff, you will use the traditional flashing method. The Tasmota Wiki page is here and is a great source of information. **Note:** As of this writing, SonOTA does not work on Sonoff devices with firmare version 1.6 or greater.

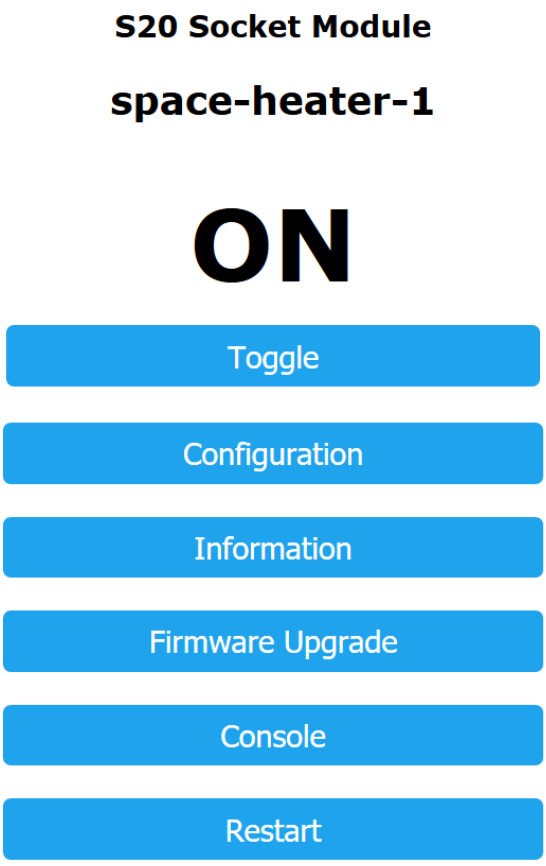
The steps outlined in the SonOTA guide are not explicit or complete but sufficient - and with a few tries, it worked great resulting in the Tasmota firmware flashed on the S20 "over the air".

I used a Windows 10 PC and followed the guide through these approx. steps. YMMV 😊

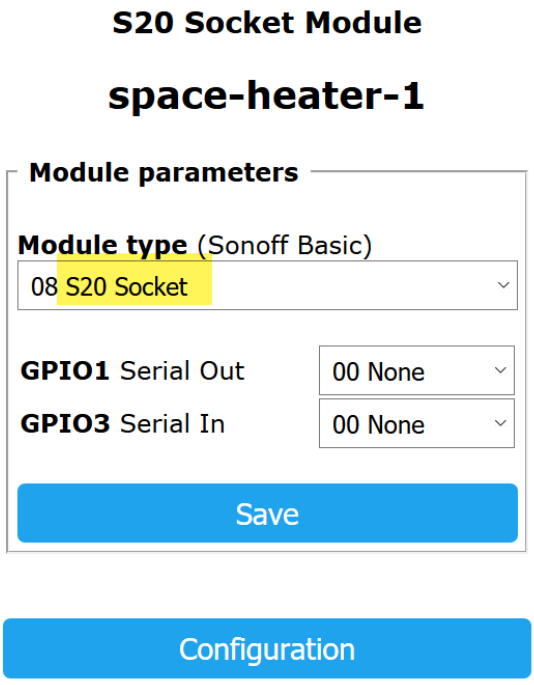
- Plug in Sonoff S20 into wall outlet
- Install Python v3.6
- Download the SonOTA zip file and extract.
- Install "Build Tools For Visual Studio 2017" (This is not documented but came up as required when I was installing the Python dependencies)



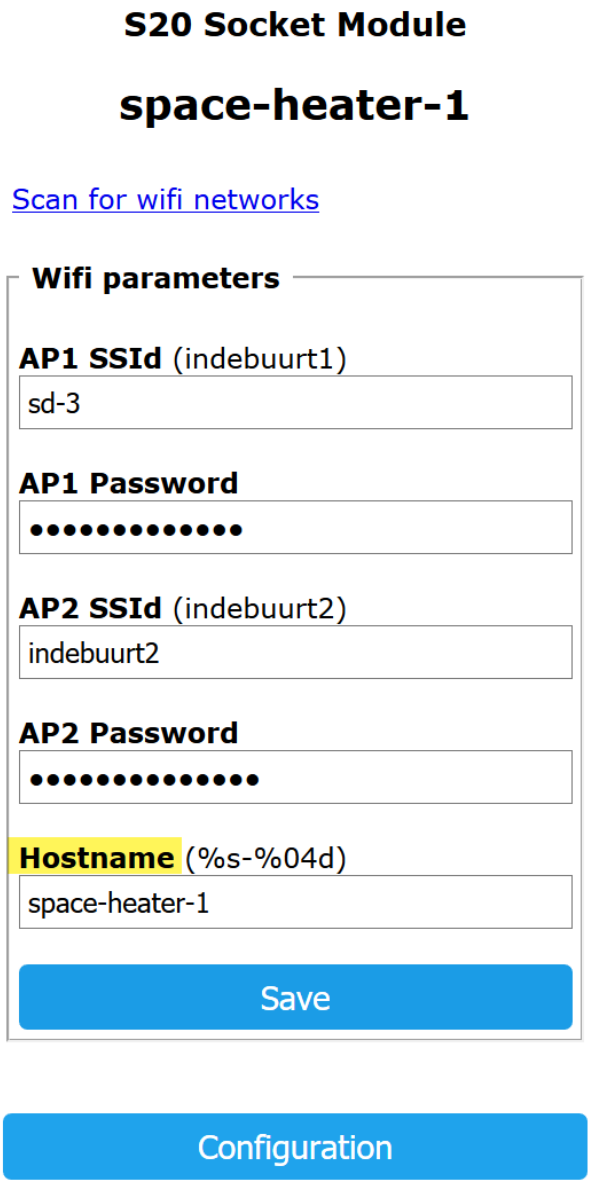
- Install the Python dependencies
- Run the SonOTA script. This will prompt for your PC's IP Address, your WiFi SSID and your WiFI Password.
- Then it will go through and prompt when to reset your S20 by holding the button down for 7 seconds and releasing.
- Connect your PC to the "ITEAD-*" WiFi network. This stage tells the S20 where to get future updates.
- Disconnect from the "ITEAD-*" WiFi network.
- Connect to you normal WiFi network: This is when the Sonoff connects to your PC to download the first part of the firmware.
- When this is done, connect your PC to the "FinalStage" WiFi network. The S20 will now download the second part of the firmware and replace the default bootloader.
- Once this is done the S20 will reboot and connect to your normal WiFi network and should get an IP address via DHCP. You will need to find the IP address of the newly flashed S20, most likely by looking at your router or DHCP server's address leases.
- Browse to this IP Address. You should see a page like this showing the Main Menu:



- Click on “Configuration > Configure Module”, select “S20 Socket” for Module Type and hit “Save”



❖ Click on “Configuration > Configure WiFi”, change the Hostname and hit “Save”. I used the same name for Hostname here and MQTT Topic in the next section.



- ❖ Click on “Configuration > Configure MQTT” and change the following:

Host: Hostname or IP address of MQTT Broker

Port: Port number of MQTT Broker

Client: Unique Client ID of Sonoff S20

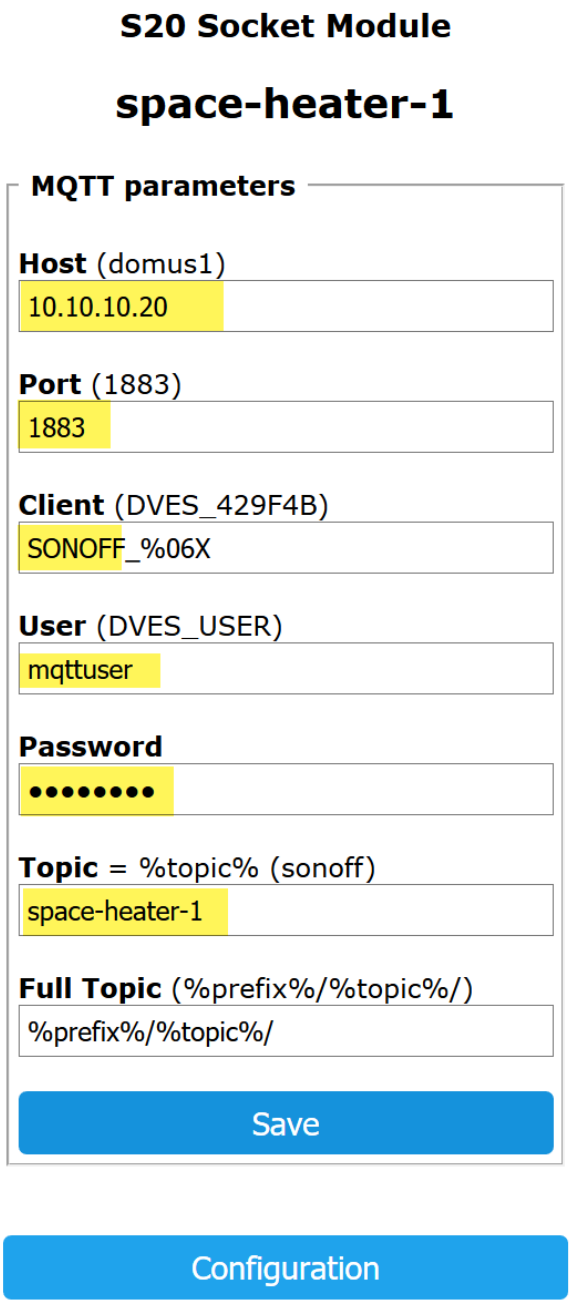
User: Username of MQTT Broker

Password: Password of MQTT Broker

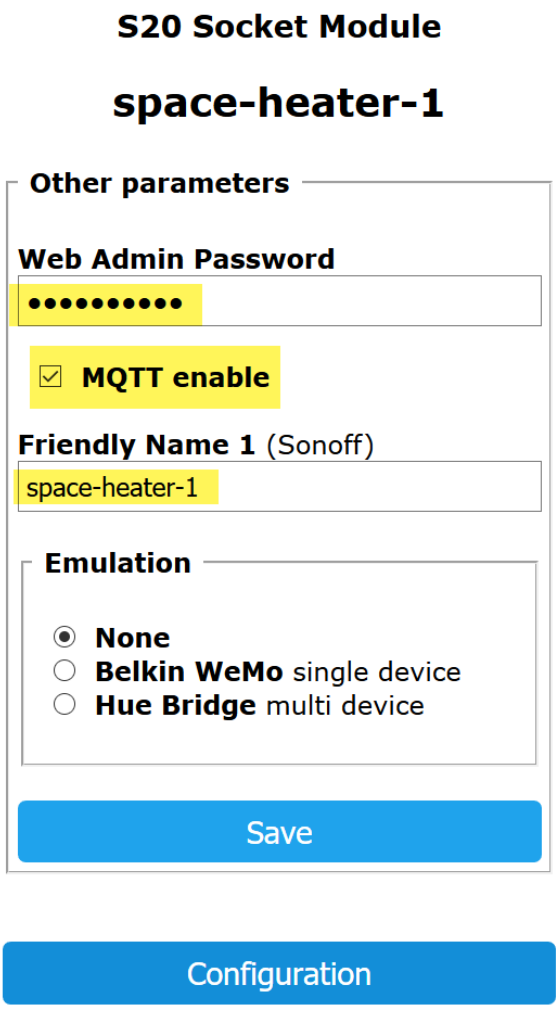
Topic: Unique MQTT Topic of Sonoff S20. I used the same name as Hostname

Full Topic: Left unchanged

Hit “Save”



- Click on “Configuration > Configure Other” and:
  - Change the Web Admin Password
  - Make Sure “MQTT enable” is checked
  - Enter the “Friendly Name 1”. I used the same name as Hostname and MQTT Topic



Hit “Save”

- You can also configure a static IP address, subnet mask, gateway and DNS server for the S20 by using MQTT commands at the device Console or HTTP URL commands in a browser. The complete Tasmota command reference is here.

Below are examples of setting a static IP address, subnet mask, gateway and DNS server using MQTT commands on the S20 Console:

IP Address: **cmnd/space-heater-1/IPAddress1 10.10.50.1**

Subnet Mask: **cmnd/space-heater-1/IPAddress3 255.255.0.0**

Gateway: **cmnd/space-heater-1/IPAddress2 10.10.10.1**

DNS Server: **cmnd/space-heater-1/IPAddress4 10.10.10.3**

❖ Clicking “Information” on the Main Menu should display a screen like this:

S20 Socket Module

space-heater-1

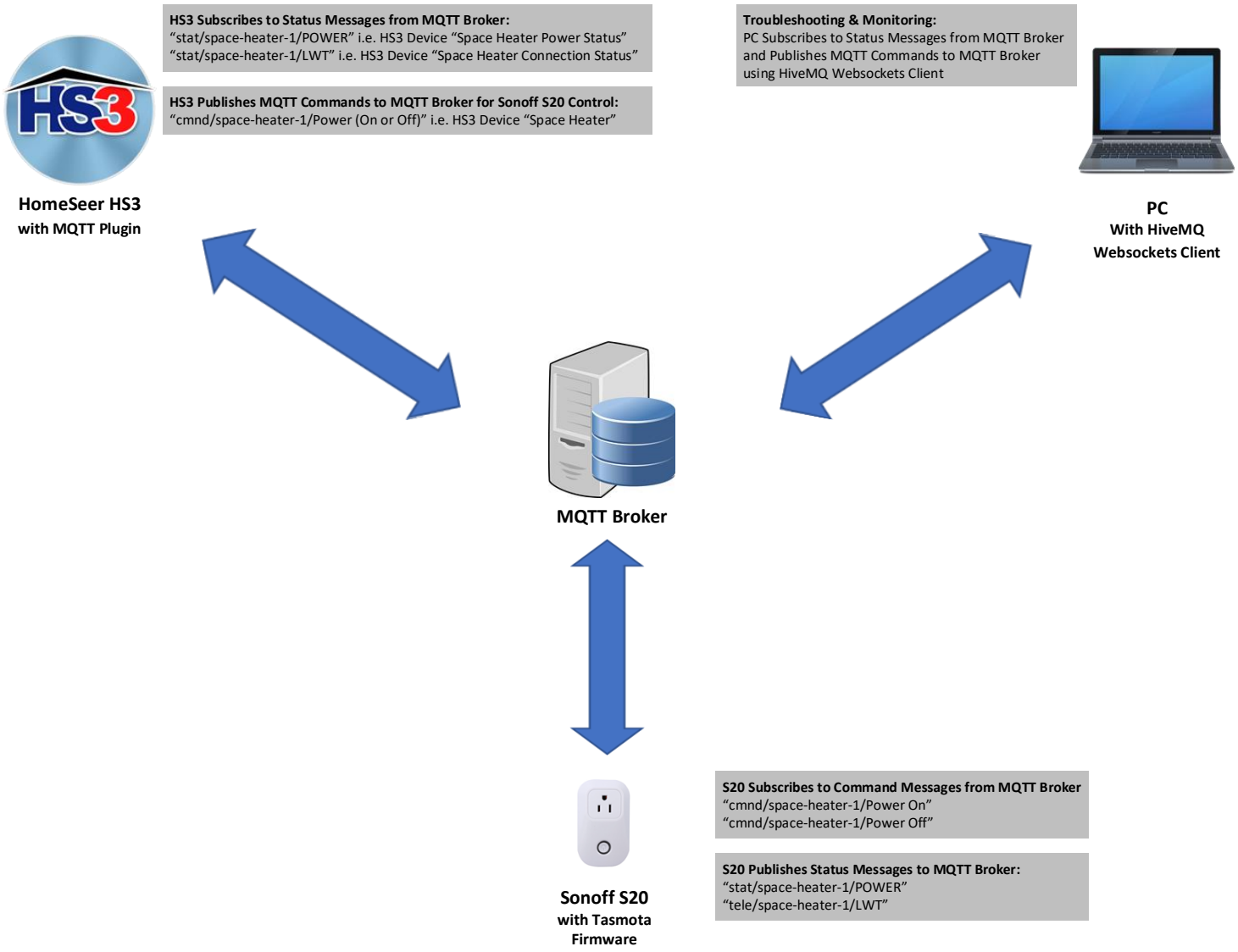
Program Version	5.9.1
Build Date & Time	2017-11-13T21:43:41
Core/SDK Version	2_3_0/1.5.3(aec24ac9)
Uptime	4 Hours
Flash write Count	69 at F7000
Boot Count	13
Restart Reason	Power on
Friendly Name 1	space-heater-1
AP1 SSId (RSSI)	sd-3 (82%)
Hostname	space-heater-1
IP Address	10.10.50.1
Gateway	10.10.10.1
Subnet Mask	255.255.0.0
DNS Server	10.10.10.3
MAC Address	5C:CF:7F:42:9F:4B
MQTT Host	10.10.10.20
MQTT Port	1883
MQTT Client & Fallback Topic	SONOFF_429F4B
MQTT User	mqttuser
MQTT Topic	space-heater-1
MQTT Group Topic	sonoffs
MQTT Full Topic	cmnd/space-heater-1/
Emulation	None
mDNS Discovery	Enabled
mDNS Advertise	Web Server
ESP Chip Id	4366155
Flash Chip Id	1327328
Flash Size	1024kB
Program Flash Size	1024kB
Program Size	471kB
Free Program Space	532kB
Free Memory	24kB

Main Menu

You are now ready to configure HomeSeer HS3.

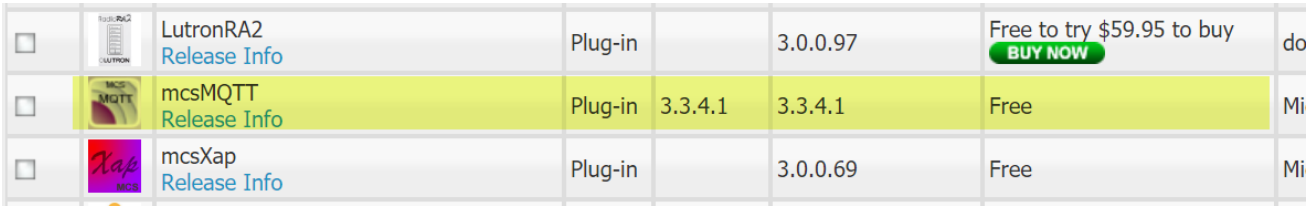
Step 3:

HS3-MQTT Broker-Sonoff S20 Messages:

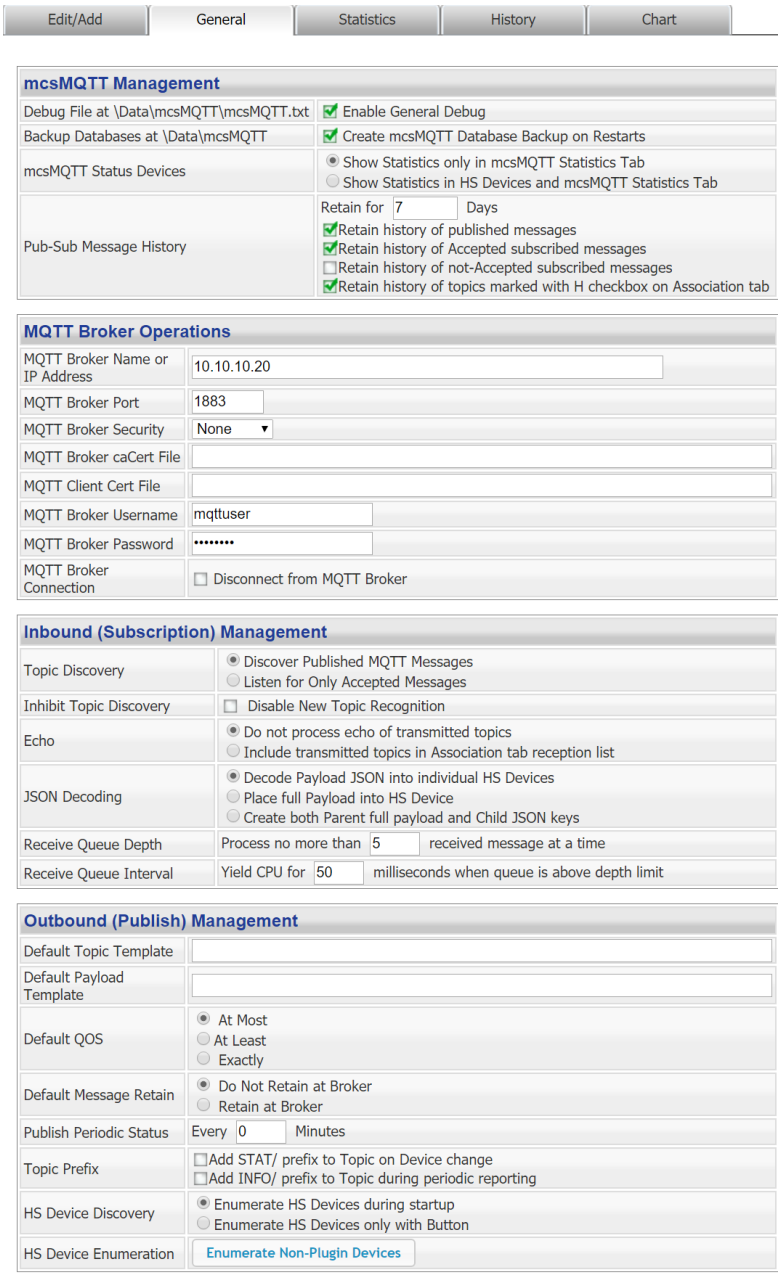


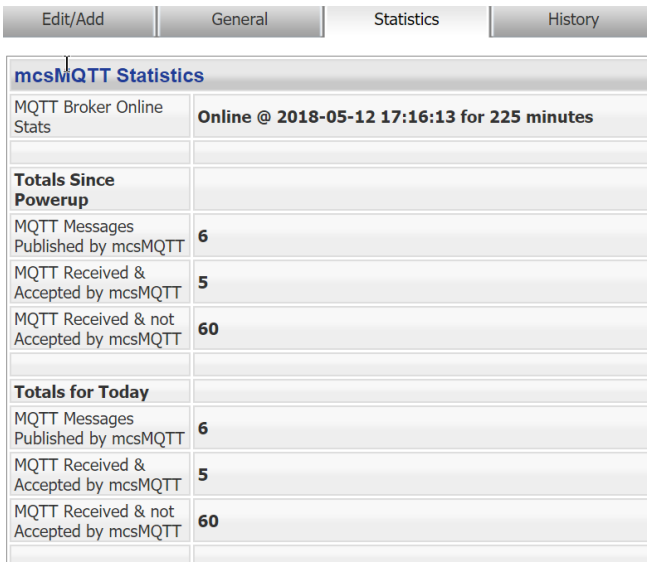
❖ **Install the HS3 MQTT Plugin and configure initial setup.**

The mcsMQTT Plugin is free and available under the “Lighting and Primary Technology” section of the HS3 Updater. There are many options available with this plugin that are beyond the scope of this guide. Refer to the plugin manual for all the details.



Here are the General and Statistics tabs of the mcsMQTT Plugin Setup page.





❖ Create and Configure the S20 Status/Control Device in HS3

When the Plugin has connected to the MQTT Broker and the Statistics tab shows “Online”, go to the “Associations” tab and refresh the page. You should see the messages from the S20 that the Plugin has subscribed to (by default the Plugin subscribes to all topics from the Broker). Click on the “A” checkbox corresponding to a Status Topic. This will create a device in HS3 and display the Device Ref # on the row of the Status Topic.

To control the Power staus of the S20, enter the “**cmnd/space-heater-1/POWER**” topic in the Publish field for the Status Topic device. Also check the “H” box to show message history for the device. The Association table should now look like this:

Association Table for Auto Association of MQTT Topic and HS Device

	H	R	A	LastDate	Ref	Topic	Payload
0	☐	☐	☐	2018-05-12 20:48:28		Sub: cmnd/space-heater-1/Power	ON
1	☑	☐	☑	2018-05-12 20:48:28	1355	Dev: Basement|Family_Room|Space_Heater Sub: stat/space-heater-1/POWER Pub: the following Topic on Device command cmnd/space-heater-1/POWER	ON
2	☐	☐	☐	2018-05-12 15:25:53		Sub: stat/space-heater-1/RESULT:Command	Unknown
3	☐	☐	☐	2018-05-12 20:48:28		Sub: stat/space-heater-1/RESULT:POWER	ON
4	☐	☐	☐	2018-05-12 17:16:14		Sub: tele/space-heater-1/LWT	Online
5	☐	☐	☐	2018-05-12 21:10:36		Sub: tele/space-heater-1/STATE:POWER	ON
6	☐	☐	☐	2018-05-12 21:10:36		Sub: tele/space-heater-1/STATE:Time	2018-05-12T20:10:36
7	☐	☐	☐	2018-05-12 21:10:36		Sub: tele/space-heater-1/STATE:Uptime	670

Clicking on the Ref # button will bring up the page below. Make sure that “Button” is selected for Control/Status UI and 0 OFF and 1 ON is listed in the Device VSP List

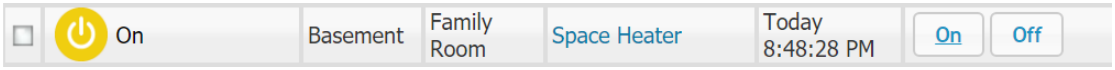
Start with Either Existing Device Ref or Subscribe Topic

Ref: 1355 | Sub: stat/space-heater-1/POWER

Edit Setup or Edit of Subscription (Inbound) to a MQTT Topic

MQTT Subscribe Topic	stat/space-heater-1/POWER
Payload RegEx Match Pattern	
Payload RegEx Replace Pattern	
Payload RegEx Operation	◉ Replace Match Pattern with Replace Pattern ○ Extract Match Pattern
Low Pass Filter	Filter sensitivity of 1 (range is 0.00 to 1.00 (most sensitive))
Expression	
Add Rate Device	☐ Create a HS Rate Device with rate sensitivity of 0.75 (Range 0.00 to 1.00)
Add Accum Device	☐ Create a HS Accum Device ☑ Reset Accumulation at Midnight
Settings for Plugin Device	
HS Device Publish Topic	cmnd/space-heater-1/POWER
HS Device Control/Status UI	○ Unspecified ◉ Button ○ Number ○ Text ○ List ○ ColorPicker
HS Device VSP List	0 OFF 1 ON
HS Device MISC Properties	☐ NO_STATUS_DISPLAY ☐ NO_GRAPHICS_DISPLAY ☐ AUTO_VOICE_COMMAND ☐ SET_DOES_NOT_CHANGE_LAST_CHANGE ☑ SHOW_VALUES ☐ STATUS_ONLY
Publish Payload Template	
Publish QOS	○ At Most ○ At Least ◉ Exactly
Publish Retain Flag	◉ Do not retain ○ Retain at broker
Settings for Non-Plugin Device	
Control non-Plugin HS Device	

The renamed device in the Device List page looks like this:



You should now be able to Power ON and OFF the Sonos S20 as well as see its status using the same HS3 device.

Enjoy!!

-taylormia