Smappee MQTT Documentation

This document describes how to use the MQTT functionality of the Smappee Monitor.

MQTT Technology

"MQTT is a Machine-to-Machine (M2M)/Internet of Things connectivity protocol. It was designed as an extremely lightweight publish/subscribe messaging transport. It is useful for connections with remote locations where a small code footprint is required and/or network bandwidth is at a premium."("What is MQTT", n.d.)

Source: What is MQTT. (n.d.). retrieved from http://mqtt.org/

General

The Smappee Infinity sends out MQTT Topics which can be picked up by an external MQTT broker or by a broker in the local network. The Smappee Infinity monitoring system is also equipped with a local MQTT broker.

Principle

- The Smappee device constantly pushes MQTT-data (topics)
- The server which is equipped with an MQTT broker, is 'subscribed' to a set of the Smappee data and redirects the data to a specified location or platform.
- The server hosting the MQTT broker can be located in the local network, cloud or other server.

Application

1. Data exchange via an external MQTT broker (mostly used)
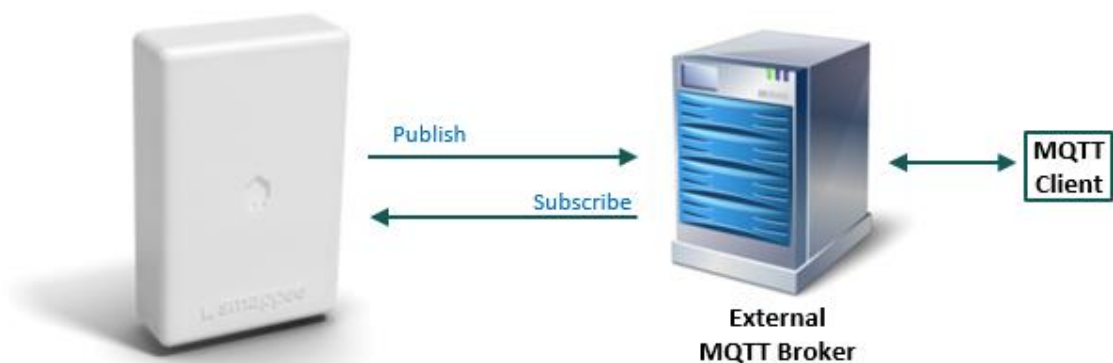
2. Node Red via local MQTT broker embedded in the Smappee Genius
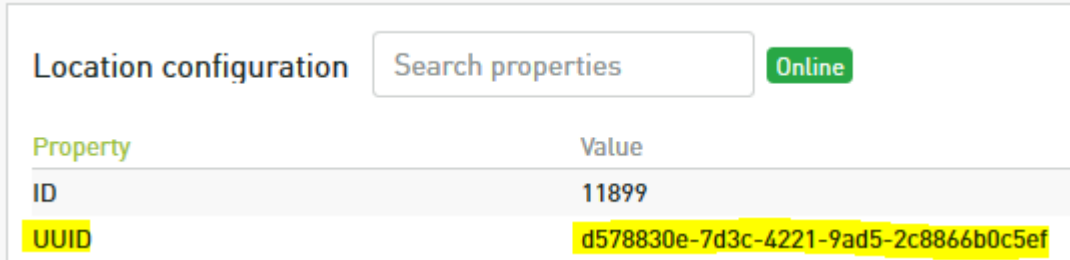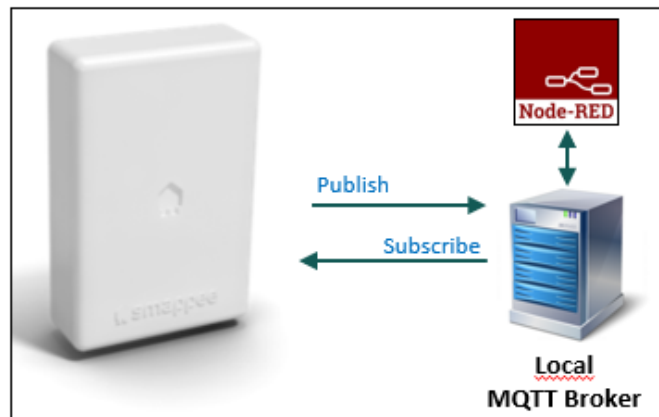

Smappee MQTT Topics Overview

- uuid: The unique identifier of the service location
- node id: The unique identifier of the plug

Topic	Message content
servicelocation/<uuid>/configuraton	Contains the meta data of the service location. (eg. serial number, owner, language, NILM version, …)
servicelocation/<uuid>/aggregated5min	Contains the consumption values aggregated per 5 minutes.
servicelocation/<uuid>/realtime	Contains real-time data of all active, reactive voltage, current and power measurements as well as energy values in Wh and Varh. Published every second.
servicelocation/<uuid>/plug/<node id>/state	Contains an indicator that the specified plug connected to the activated Smappee device on the specified service location is switched ON or OFF. Also contains the time stamp for when the switch reached the status ON or OFF.
servicelocation/<uuid>/plug/<node id>/setstate	Sets the status ON or OFF on the specified plug on the activated Smappee device on the specified service location.

How to obtain the UUID?

The Service location UUID can be obtained in two ways:

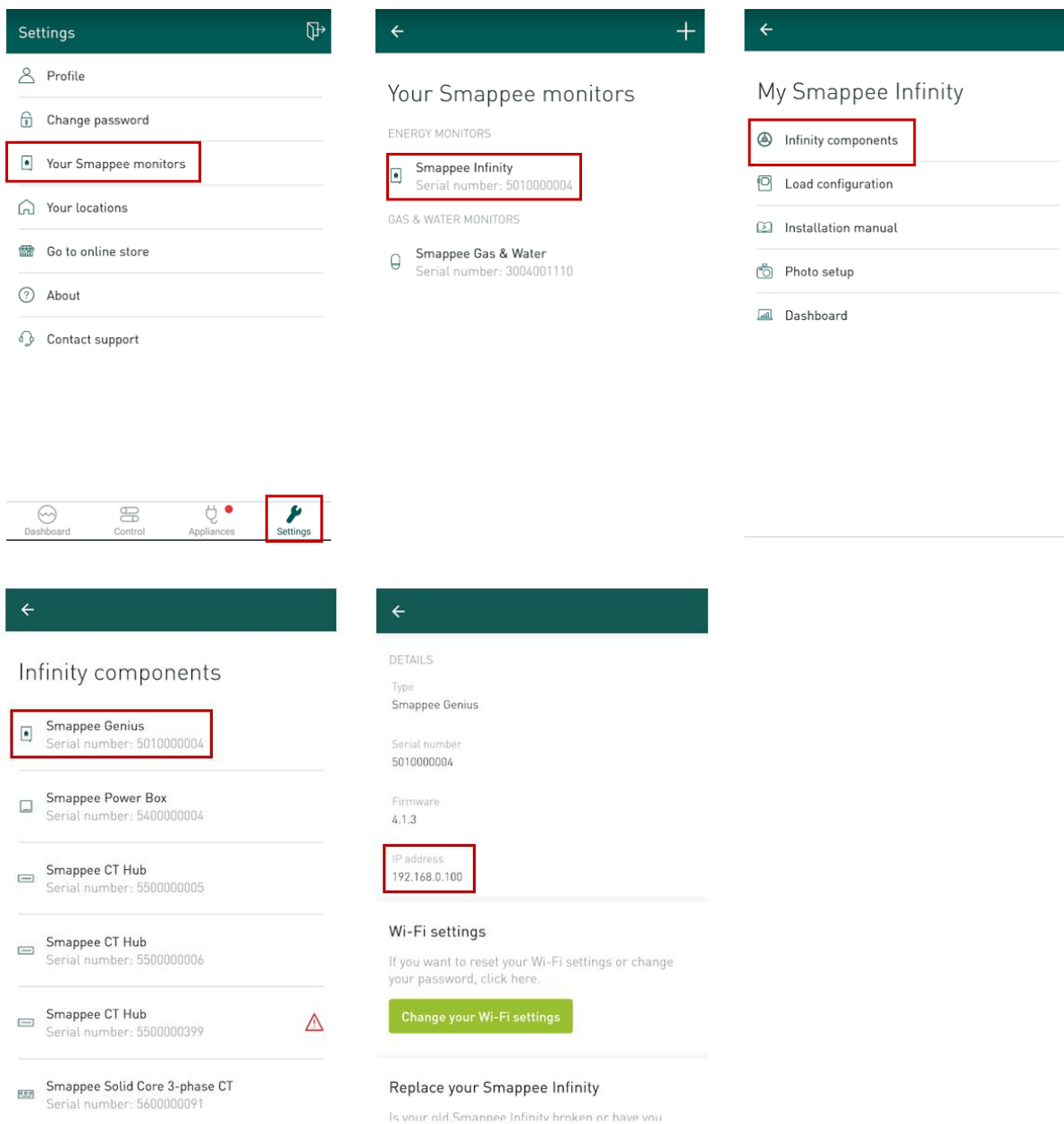1. **Smappee Partner Dashboard**: https://dashboard.smappee.net (Location Configuration Card):

2. **One-time REST API call:**
   https://smappee.atlassian.net/wiki/spaces/DEVAPI/pages/526483487/Get+Servicelocations

3. **Wildcard as UUID**: use a MQTT wildcard as UUID and based on the Configuration Topic results, match it to the serial number you need (https://www.hivemq.com/blog/mqtt-essentials-part-5-mqtt-topics-best-practices).

Setup Smappee Device

The MQTT-Broker location is set up on the Smappee monitor using the Expert Portal by following the steps explained below:

1. Log in to the Expert Portal of the Smappee Monitor: Determine the IP-address of the Smappee in the mobile app for your Smappee device. Go to Settings – Your Smappee Monitors – Smappee Infinity – Infinity Components – Smappee Genius.
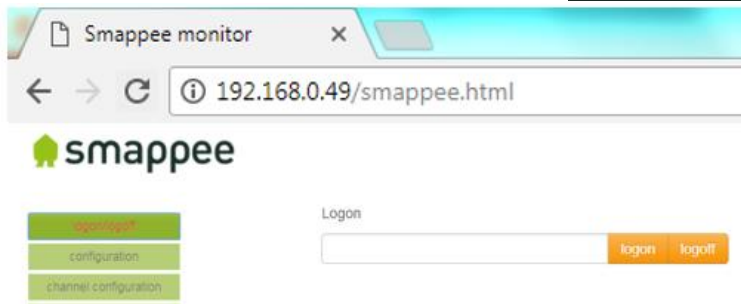
<u>Note:</u> The tablet or laptop needs to be connected to the **same network** as the Smappee monitor to be able to use the Expert Portal.
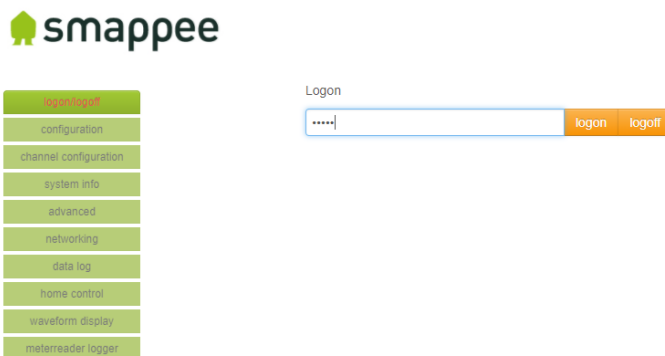
2. Fill in the URL mentioned in your web browser: **http://<IP-address>/smappee.html**

3. Click on and fill in password "**admin**" and click

4. Click on

5. Fill in the location of the external MQTT Broker with either an IP-address or domain and authentication (if applicable).

Advanced config parameters	Setting	
Webportal password	admin	
Active power lower limit (color green->yellow)	0	W (0=off)
Active power upper limit (color yellow->orange)	0	W (0=off)
Meter reader logging	0	nr of 5 second entries (0=disabled) (1h/file)
MQTT local broker url (e.g. tcp://192.168.0.48:1883)	tcp://localhost:1883	
MQTT local broker username		
MQTT local broker password		

Apply changes and restart monitor

6. To save the settings, click .

MQTT Topics Details

Topic name	Parameters	Description	Retained	Example content

servicelocation/<**uuid**>/config	uuid: The unique identifier of the service location	Contains the meta information of the service location as key/value pairs	true	{
				  "utcTimeStamp":1516351781376,
				  "deviceUuid":"c82b8446-3457-407a-82f4-9e1d78e94e34",
				  "serialNumber":"2004000025",
				  "serviceLocationUuid":"a02e00de-b589-11e7-bebe-0221c2cd44f5",
				  "serviceLocationId":555,
				
				  "firmwareVersion":"V3125",
				
				  "aggregationPeriodSeconds":300,
				
				}

servicelocation/<**uuid**>/sensorConfig	uuid: The unique identifier of the service location		true	{
				  "utcTimeStamp":1516355153244,
				  "gwSensors":[
				    {
				      "gwSensorChannelsConfig":[
				        {
				          "leakIntervals":2,
				          "maxPulses":150,
				          "ppu":1.0,
				          "uom":"l",
				          "enabled":true,
				          "type":"WATER"
				        },
				        {
				          "leakIntervals":0,
				          "maxPulses":5,
				          "ppu":1.0,
				          "uom":"m3",
				          "enabled":false,
				          "type":"GAS"
				        }
				      ],
				      "sensorId":175,
				      "serialNumber":"3004001483"
				    }
				  ],
				  "switchSensors":[
				    {
				      "name":"Nieuwe plug 1",
				      "serialNumber":"4004000101",
				      "sensorId":173
				    },
				    {
				      "name":"TestAndre",
				      "serialNumber":"4006999999",
				      "sensorId":174
				    }
				  ]
				}

servicelocation/<**uuid**>/channelConfig	uuid: The unique identifier of the service location		true	{
				  "utcTimeStamp":1516351942839,
				  "inputChannels":[
				    {

					"ctInput":0, "name":"load1", "phase":0, "inputChannelType":"CONSUMPTION", "inputChannelConnection":"GRID", "reversed":false, "nilm":false, "balanced":false, "inputChannelCTType":"CT50_100_200" }, { "ctInput":1, "name":"load2", "phase":0, "inputChannelType":"CONSUMPTION", "inputChannelConnection":"SUBMETER", "reversed":true, "nilm":false, "balanced":false, "inputChannelCTType":"CT50_100_200" }, { "ctInput":2, "name":"load3", "phase":0, "inputChannelType":"UNUSED", "inputChannelConnection":"OFF_GRID", "reversed":false, "nilm":false, "balanced":false, "inputChannelCTType":"CT50_100_200" }, { "ctInput":3, "name":"solar1", "phase":0, "inputChannelType":"UNUSED", "inputChannelConnection":"OFF_GRID", "reversed":false, "nilm":false, "balanced":false, "inputChannelCTType":"CT50_100_200" }, { "ctInput":4, "name":"solar2", "phase":0, "inputChannelType":"UNUSED", "inputChannelConnection":"OFF_GR

| | | | | ID",
    "reversed":true,
    "nilm":false,
    "balanced":false,
    "inputChannelCTType":"CT50_100_200"
  },
  {
    "ctInput":5,
    "name":"solar3",
    "phase":0,
    "inputChannelType":"UNUSED",
    "inputChannelConnection":"OFF_GRID",
    "reversed":true,
    "nilm":false,
    "balanced":false,
    "inputChannelCTType":"CT50_100_200"
  },
  {
    "ctInput":6,
    "name":"test3",
    "phase":0,
    "inputChannelType":"UNUSED",
    "inputChannelConnection":"GRID",
    "reversed":false,
    "nilm":false,
    "balanced":false,
    "inputChannelCTType":"CT50_100_200"
  },
  {
    "ctInput":7,
    "name":"",
    "phase":0,
    "inputChannelType":"UNUSED",
    "inputChannelConnection":"GRID",
    "reversed":false,
    "nilm":false,
    "balanced":false,
    "inputChannelCTType":"CT50_100_200"
  },
  {
    "ctInput":8,
    "name":"",
    "phase":0,
    "inputChannelType":"UNUSED",
    "inputChannelConnection":"GRID",
    "reversed":false,
    "nilm":false,
    "balanced":false,
    "inputChannelCTType":"CT50_100_200"
  }
 ]
}
| | | | |

servicelocation/**<uuid**>/homeControlConfig	uuid: The unique identifier of the service location		true	```{ "utcTimeStamp":1516351781394, "switchActuators":[{ "nodeId":42, "name":"Nieuwe plug 1", "serialNumber":"4004000101" }, { "nodeId":43, "name":"TestAndre", "serialNumber":"4006999999" }], "smartplugActuators":[{ "nodeId":50, "name":"Nieuwe plug 3" }] }```
servicelocation/**<uuid**>/presence	uuid: The unique identifier of the service location	Contains a flag that indicates if the smappee device that is activated on the service location detected presence based on the actual consumption.	true	```{ "value": true }```
servicelocation/**<uuid**>/realtime	uuid: The unique identifier of the service location	Contains the realtime power values. Note that this information is published every second. Where: - power in W (watt) - energy in J (joule, Ws) (not persisted, reset to 0 on every software restart) - voltage in V (volt) - current in dA (deciampère) - totals are the aggregated values taken into	false	```{ "totalPower":98, "totalReactivePower":116, "totalExportEnergy":0, "totalImportEnergy":344037, "monitorStatus":0, "utcTimeStamp":1516355206580, "channelPowers":[{ "ctInput":0, "power":98, "exportEnergy":0, "importEnergy":344037, "phaseId":0, "current":7 }, { "ctInput":1, "power":99, "exportEnergy":0, "importEnergy":346027, "phaseId":0, "current":7 }], "voltages":[```

| | | account the channel configuration | | ```json
{
  "voltage":207,
  "phaseId":0
},
{
  "voltage":0,
  "phaseId":1
},
{
  "voltage":0,
  "phaseId":2
}
]
}
``` |
|---|---|---|---|---|
| servicelocation/<**uuid**>/aggregated | uuid: The unique identifier of the service location | Contains the consumption values aggregated per 5 minutes.<br><br>Note that this information is published every 5 minutes. | false | ```json
{
  "intervalDatas":[
    {
      "utcEndtime":1516632600000,
      "averageRMSVoltages":[
        2231,
        0,
        0
      ],
      "alwaysOn":78702,
      "channelIntervalDatas":[
        {
          "averageRMSCurrent":673,
          "averageImportRMSActivePower":100513,
          "averageExportRMSActivePower":0,
          "averageRMSApparentPower":150597,
          "averageRMSReactivePower":111867,
          "averagePowerfactor":65,
          "ctInput":0
        },
        {
          "averageRMSCurrent":675,
          "averageImportRMSActivePower":101089,
          "averageExportRMSActivePower":0,
          "averageRMSApparentPower":150962,
          "averageRMSReactivePower":111832,
          "averagePowerfactor":65,
          "ctInput":1
        },
        {
          "averageRMSCurrent":0,
          "averageImportRMSActivePower":0,
          "averageExpor
``` |

				tRMSActivePower":0, "averageRMSAp parentPower":0, "averageRMSRe activePower":0, "averagePower factor":0, "ctInput":2 }, { "averageRMSCu rrent":0, "averageImpor tRMSActivePower":0, "averageExpor tRMSActivePower":0, "averageRMSAp parentPower":0, "averageRMSRe activePower":0, "averagePower factor":0, "ctInput":3 }, { "averageRMSCu rrent":0, "averageImpor tRMSActivePower":0, "averageExpor tRMSActivePower":0, "averageRMSAp parentPower":0, "averageRMSRe activePower":0, "averagePower factor":0, "ctInput":4 }, { "averageRMSCu rrent":0, "averageImpor tRMSActivePower":0, "averageExpor tRMSActivePower":0, "averageRMSAp parentPower":0, "averageRMSRe activePower":0, "averagePower factor":0, "ctInput":5 }, { "averageRMSCu rrent":0, "averageImpor tRMSActivePower":0, "averageExpor tRMSActivePower":0, "averageRMSAp parentPower":0, "averageRMSRe activePower":0, "averagePower factor":0,

```
                                  "ctInput":6
                              },
                              {
                                  "averageRMSCu
rrent":0,
                                  "averageImpor
tRMSActivePower":0,
                                  "averageExpor
tRMSActivePower":0,
                                  "averageRMSAp
parentPower":0,
                                  "averageRMSRe
activePower":0,
                                  "averagePower
factor":0,
                                  "ctInput":7
                              },
                              {
                                  "averageRMSCu
rrent":0,
                                  "averageImpor
tRMSActivePower":0,
                                  "averageExpor
tRMSActivePower":0,
                                  "averageRMSAp
parentPower":0,
                                  "averageRMSRe
activePower":0,
                                  "averagePower
factor":0,
                                  "ctInput":8
                          }
                      ],
                      "version":2
                  }
              ]
}
```

servicelocation/<**uuid**>/aggregatedGW		Contains the consumption values aggregated per 5 minutes.
		
		Note that this information is published on the 5 minutes boundary only if there
		was consumption during that 5 minute period.
				`{`
				`  "gwIntervalDatas":[`
				`   {`
				`     "utcEndtime":1516632900000,`
				`     "sensorId":175,`
				`     "index0Delta":2,`
				`     "index1Delta":0,`
				`     "temperature":246,`
				`     "humidity":45,`
				`     "battLevel":67,`
				`     "version":1`
				`   }`
				`  ]`
				`}`

servicelocation/<**uuid**>/aggregatedSwitch		Contains the consumption values aggregated per 5 minutes.
		
		Note that this information is published every 5 minutes.
				`{`
				`  "switchIntervalDatas":[`
				`   {`
				`     "utcEndtime":1516632600000,`
				`     "activePower":0,`
				`     "reactivePower":0,`
				`     "version":1,`
				`     "sensorId":173`
				`   }`

				```] }```

servicelocation/**<uuid>**/plug/**<node id>**/state	uuid: The unique identifier of the service location
	
	node id: The unique identifier of the plug
		Contains an indicator that the specified plug at the smappee device that is activated on the specified service location, is switched on or off and the timestamp on which the switch to that state occurred.
		
		The timestamp is the number of milliseconds that have passed since Jan 1st, 1970 (UTC).
			true	```
				{
				  "value": "ON",
				  "since": 1505479692000
				}
				{
				  "value": "OFF",
				  "since": 1505479692000
				}```

servicelocation/**<uuid>**/plug/**<node id>**/connectionState	uuid: The unique identifier of the service location
	
	node id: The unique identifier of the plug
		Contains an indicator that the specified plug at the smappee device that is linked to the service location, is connected (1), dicaonnected (0), or unreachable (2) and the timestamp on which the switch to that state occurred.
		
		The timestamp is the number of milliseconds that have passed since Jan 1st, 1970 (UTC).
			true	```
				{
				  "value":"CONNECTED",
				  "since":1516355163247
				}
				
				{
				  "value":"DISCONNECTED",
				  "since":1516355163247
				}
				
				{
				  "value":"UNREACHABLE",
				  "since":1516355163247
				}```

servicelocation/**<uuid>**/plug/**<node id>**/setstate	uuid: The unique identifier of the service location
	
	node id: The unique identifier of the plug
		Sets the state 'On' or 'Off' on the specified plug at the smappee device that is activated on the specified service location.	true	```
				{
				  "value": "ON",
				  "since": 1505479692000
				}
				{
				  "value": "OFF",
				  "since": 1505479692000
				}```

servicelocation/<uuid>/trigger	uuid: The unique identifier of the service location	reports a trigger action
		
		- triggerId assigned by
			true	```
				{
				"triggerId": 3,
				"label": "Nieuwe Trigger 3",
				"controllableNodeIds": [2],
				"type":
				"ACTIVE_POWER_ABOVE",```

		backend during configuration
		- controllableNodes may be empty or uses nodeId from homeControlconfig
		- all other values according to the configuration of the trigger
		- Not all values are used for specific trigger types
				<pre>"longitude": 0.0,
				"latitude": 0.0,
				"radius": 0,
				"delay": 0,
				"action": "ON",
				"threshold": 100.0
				}</pre>

ervicelocation/<uuid>/scheduler	uuid: The unique identifier of the service location	reports a scheduler action
		- schedulerId assigned by backend during configuration
		- controllableNodes may be empty or uses nodeId from homeControlconfig
		- all other values according to the configuration of the trigger
				<pre>{
				"schedulerId": 2,
				"label": "Nieuwe Trigger off",
				"controllableNodeIds": [],
				"hour": 9,
				"min": 10,
				"day": "ALL_DAYS",
				"action": "OFF"
				}</pre>