Domoticz Plugin

Soil Moisture Monitor

(using Tinkerforge Building Blocks)

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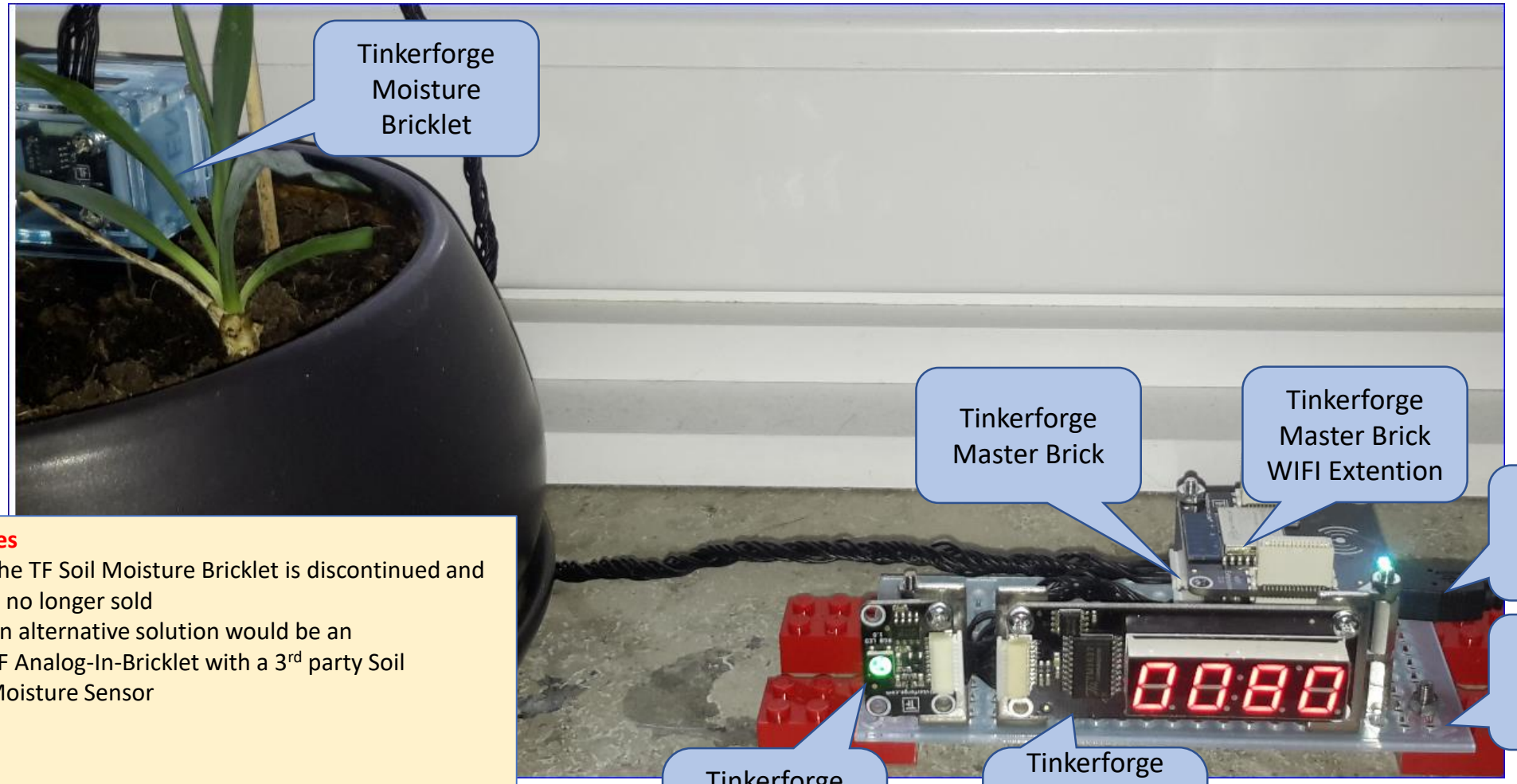
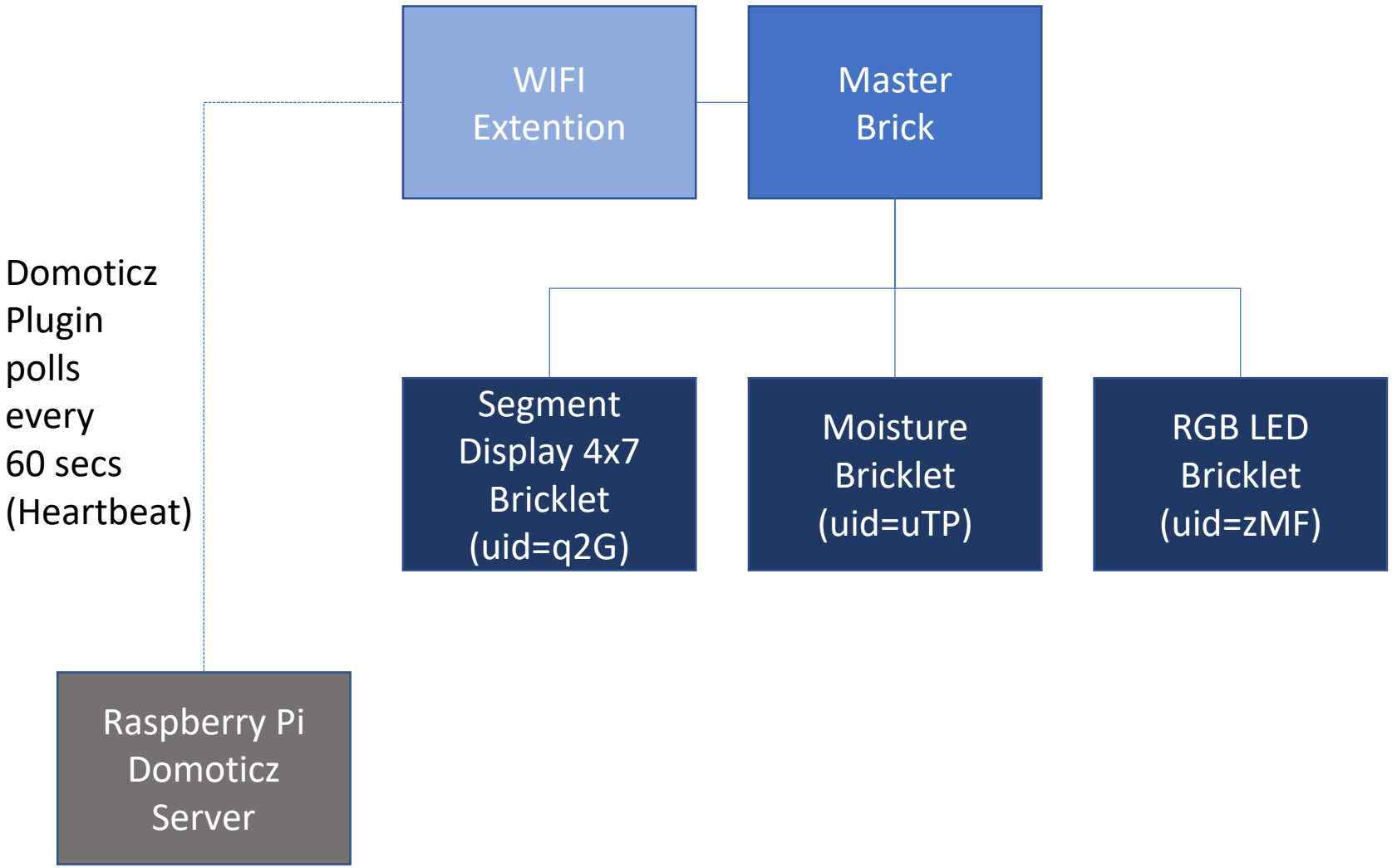
Prototype

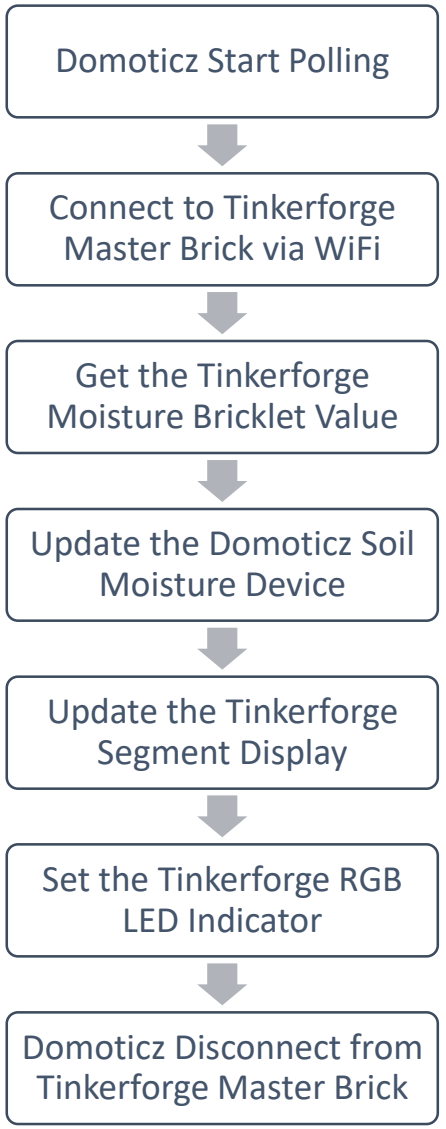


Notes

- The TF Soil Moisture Bricklet is discontinued and is no longer sold
- An alternative solution would be an TF Analog-In-Bricklet with a 3rd party Soil Moisture Sensor

Communication





Domoticz – Add Hardware Soil Moisture Monitor

Notes

The Bricklet UIDs must be comma separated.
Obtain the UIDs via the Tinkerforge Brick Viewer.

To turn the RGB LED OFF, set the brightness to 0.
Brightness ranges from 0 to 100.

Important Node on the Check Interval
The Domoticz heartbeat is set to every 60 seconds. Do not use a higher value as Domoticz message "Error: hardware (N) thread seems to have ended unexpectedly"
The Soil Moisture Monitor is read every Parameter.Mode5 seconds. This is determined by using a hearbeatcounter which is triggered by:
(self.HeartbeatCounter * self.HeartbeatInterval) % int(Parameter.Mode5) = 0
self.HeartbeatInterval = 60; self.HeartbeatCounter = 0;
Read plugin.py

Set Debug to true during development, else set to false.

Domoticz – Hardware & Soil Moisture Device

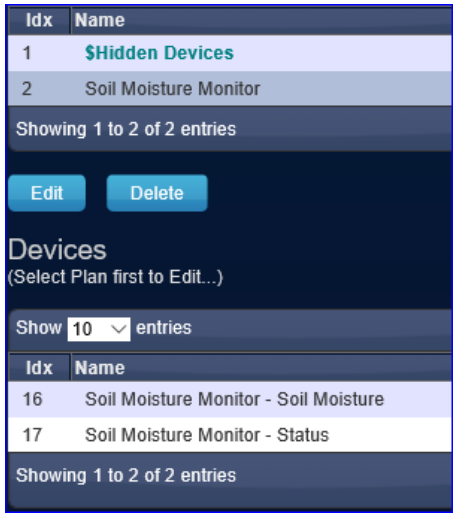
Devices List

	Idx	Hardware	ID	Unit	Name	Type	SubType	
	16	Soil Moisture Monitor	00080001	1	Soil Moisture Monitor - Soil Moisture	General	Soil Moisture	59 cb
	17	Soil Moisture Monitor	00080002	2	Soil Moisture Monitor - Status	General	Text	Polling OK: TF=2917, Dom=59, LED=41

Device Widgets with Room Plan „Soil Moisture Monitor“ + Trend Soil Moisture

00 - 09 = saturated
10 - 19 = adequately wet
20 - 59 = irrigation advice
60 - 99 = irrigation
100-200 = Dangerously dry

Room Plan „Soil Moisture Monitor“ with Soil Moisture Monitor Devices



Domoticz – Plugin XML Definition

See plugin.py

```
<plugin key="SoilMoistureMonitor" name="Soil Moisture Monitor" author="rwbL" version="1.1.0">
  <description>
    <h2>Soil Moisture Monitor</h2><br/>
    In regular intervals, obtain the moisture value from the Tinkerforge Moisture Bricklet.
    <ul style="list-style-type:square">
      <li>Display the value, 0 (dry) - 100 (wet), in the Tinkerforge Segment Display 4x7 Bricklet</li>
      <li>Indicate the state, red(dry) or yellow(irrigation advice) or green(adequaly wet), in the Tinkerforge RGB LED Bricklet</li>
      <li>Show the value (cp) and state in a Domoticz Soil Moisture device</li>
    </ul>
    <h3>Features</h3>
    <ul style="list-style-type:square">
      <li>Moisture value</li>
      <li>00 - 09 = saturated, 10 - 19 = adequately wet, 20 - 59 = irrigation advice, 60 - 99 = irrigation, 100-200 = Dangerously dry</li>
      <li>LED Indicator: RED=dry <20 or YELLOW=irrigation advice =>20 and <40 or GREEN=adequaly wet > 40</li>
    </ul>
    <h3>Soil Moisture Devices</h3>
    <ul style="list-style-type:square">
      <li>Soil Moisture Value - Soil Moisture device showing the value (cp) and advice</li>
      <li>Soil Moisture Status - Text device to show the latest change or any error condition</li>
    </ul>
    <h3>Configuration</h3>
    Requires the HTTP address and Port of the Master Brick WiFi Extention and the UIDs of the Tinkerforge Bricklets Moisture, Segment Display, RGB LED.<br/>
    The Tinkerforge Bricklet UIDs to be defined as comma separated string of UIDs.
  </description>
  <params>
    <param field="Address" label="Host" width="200px" required="true" default="192.168.1.112"/>
    <param field="Port" label="Port" width="75px" required="true" default="4223"/>
    <param field="Mode1" label="UIDs" width="200px" required="true" default="uTP,q2G,zMF"/>
    <param field="Mode4" label="LED Brightness" width="50px" required="true" default="100"/>
    <param field="Mode5" label="“Polling (seconds)" width="50px" required="true" default="60"/>
    <param field="Mode6" label="Debug" width="75px">
      <options>
        <option label="True" value="Debug" default="true"/>
        <option label="False" value="Normal"/>
      </options>
    </param>
  </params>
</plugin>
```

Domoticz – Plugin Pseudo Code

See plugin.py

```
Define imports and amend path

Define constants for RGB LED, Moisture Limits

Define class BasePlugin:
        Init
                Heartbeat and Connection state
        onStart
                Create the devices, set heartbeat
        onHeartbeat
                Check heartbeat
                Connect master brick
                Create bricklet objects
                Get moisture value
                Update segment display & rgb led
                Disconnect master brick
```

Domoticz - Add Hardware Log

```
2019-05-29 08:51:45.983 Status: (Soil Moisture Monitor) Started.
2019-05-29 08:51:46.489 (Soil Moisture Monitor) Debug logging mask set to: PYTHON PLUGIN QUEUE IMAGE DEVICE CONNECTION MESSAGE ALL
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'Mode6':'Debug'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'Name':'Soil Moisture Monitor'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'DomoticzBuildTime':'2019-05-28 13:05:24'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'Version':'1.1.0'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'Author':'rwbL'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'HomeFolder':'/home/pi/domoticz/plugins/SoilMoistureMonitor/'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'DomoticzVersion':'4.10841'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'Mode5':'60'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'Database':'/home/pi/domoticz/domoticz.db'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'UserDataFolder':'/home/pi/domoticz/'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'Mode1':'uTP,q2G,zMF'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'Port':'4223'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'Address':'192.168.1.112'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'HardwareID':'8'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'StartupFolder':'/home/pi/domoticz/'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'Mode4':'100'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'Language':'en'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'Key':'SoilMoistureMonitor'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) 'DomoticzHash':'5afd0eb96'
2019-05-29 08:51:46.489 (Soil Moisture Monitor) Device count: 0
2019-05-29 08:51:46.489 (Soil Moisture Monitor) Creating new Devices
2019-05-29 08:51:46.490 (Soil Moisture Monitor) Creating device 'Soil Moisture'.
2019-05-29 08:51:46.491 (Soil Moisture Monitor) Device created: Soil Moisture Monitor - Soil Moisture
2019-05-29 08:51:46.491 (Soil Moisture Monitor) Creating device 'Status'.
2019-05-29 08:51:46.492 (Soil Moisture Monitor) Device created: Soil Moisture Monitor - Status
2019-05-29 08:51:46.492 (Soil Moisture Monitor) Heartbeat set: 60
2019-05-29 08:51:46.492 (Soil Moisture Monitor) Pushing 'PollIntervalDirective' on to queue
2019-05-29 08:51:46.492 (Soil Moisture Monitor) Processing 'PollIntervalDirective' message
2019-05-29 08:51:46.492 (Soil Moisture Monitor) Heartbeat interval set to: 60.
2019-05-29 08:51:46.486 Status: (Soil Moisture Monitor) Entering work loop.
2019-05-29 08:51:46.487 Status: (Soil Moisture Monitor) Initialized version 1.1.0, author 'rwbL'
```

	Idx	Hardware	ID	Unit	Name	Type	SubType	Data
	16	Soil Moisture Monitor	00080001	1	Soil Moisture Monitor - Soil Moisture	General	Soil Moisture	62 cb
	17	Soil Moisture Monitor	00080002	2	Soil Moisture Monitor - Status	General	Text	Polling OK: TF=2952, Dom=62, LED=38

Domoticz - Polling Data Log

Polling (=Heartbeat 60 seconds) with Debug = True

```
2019-05-28 19:36:51.236 (Soil Moisture Monitor) Pushing 'onHeartbeatCallback' on to queue
2019-05-28 19:36:51.240 (Soil Moisture Monitor) Processing 'onHeartbeatCallback' message
2019-05-28 19:36:51.240 (Soil Moisture Monitor) Calling message handler 'onHeartbeat'.
2019-05-28 19:36:51.240 (Soil Moisture Monitor) onHeartbeat called. Counter=840 (Heartbeat=60)
2019-05-28 19:36:51.241 (Soil Moisture Monitor) UIDs:uTP,q2G,zMF
2019-05-28 19:36:51.253 (Soil Moisture Monitor) IP Connection - OK
2019-05-28 19:36:51.258 (Soil Moisture Monitor) Tinkerforge value:2918
2019-05-28 19:36:51.258 (Soil Moisture Monitor) Domoticz value:59
2019-05-28 19:36:51.258 (Soil Moisture Monitor - Soil Moisture) Updating device from 59:'0' to have values 59:'0'.
2019-05-28 19:36:51.266 (Soil Moisture Monitor) Segment Display updated
2019-05-28 19:36:51.266 (Soil Moisture Monitor) RGB LED updated. Brightness=100
2019-05-28 19:36:51.369 (Soil Moisture Monitor - Status) Updating device from 0:'Polling OK: TF=2918, Dom=59, LED=41' to have values 0:'Polling OK: TF=2918, Dom=59, LED=41'.
2019-05-28 19:36:51.378 (Soil Moisture Monitor) Polling OK: TF=2918, Dom=59, LED=41
```

Polling (=Heartbeat 60 seconds) with Debug = False

```
2019-05-28 19:46:48.533 Status: Hardware Monitor: Started
2019-05-28 19:46:49.382 Status: (Soil Moisture Monitor) Entering work loop.
2019-05-28 19:46:49.383 Status: (Soil Moisture Monitor) Initialised version 1.1.0, author 'rwbL'
2019-05-28 19:46:49.553 Status: MQTT: Connecting to 192.168.1.179:1883
2019-05-28 19:46:49.653 Status: MQTT: connected to: 192.168.1.179:1883
2019-05-28 19:46:49.754 Status: MQTT: Subscribed
2019-05-28 19:46:59.539 (Soil Moisture Monitor) Polling OK: TF=2920, Dom=60, LED=40
2019-05-28 19:47:59.578 (Soil Moisture Monitor) Polling OK: TF=2919, Dom=59, LED=41
2019-05-28 19:48:59.581 (Soil Moisture Monitor) Polling OK: TF=2919, Dom=59, LED=41
2019-05-28 19:49:59.576 (Soil Moisture Monitor) Polling OK: TF=2920, Dom=60, LED=40
2019-05-28 19:50:59.566 (Soil Moisture Monitor) Polling OK: TF=2920, Dom=60, LED=40
```