

IoT Showcase WeatherCubeOne2

The **WeatherCubeOne** is a showcase for using MQTT with

- TinkerForge Bricklets,
- Domoticz Home Automation and
- Google Charts.

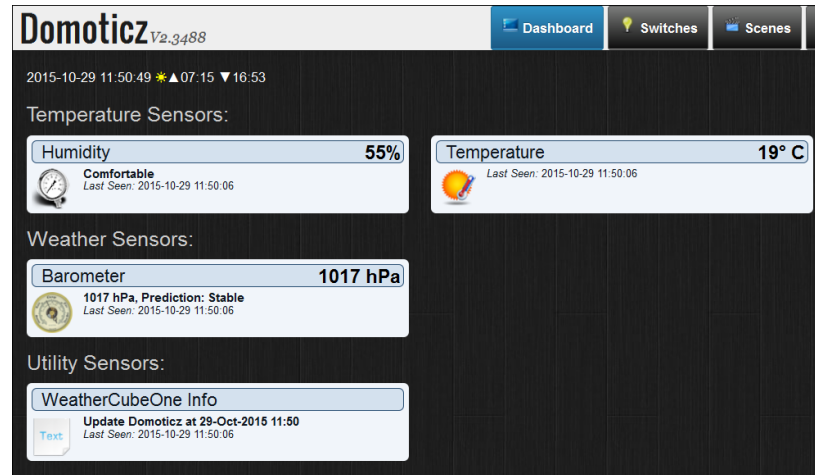
Version 20160628

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WeatherCubeOne2 - Overview

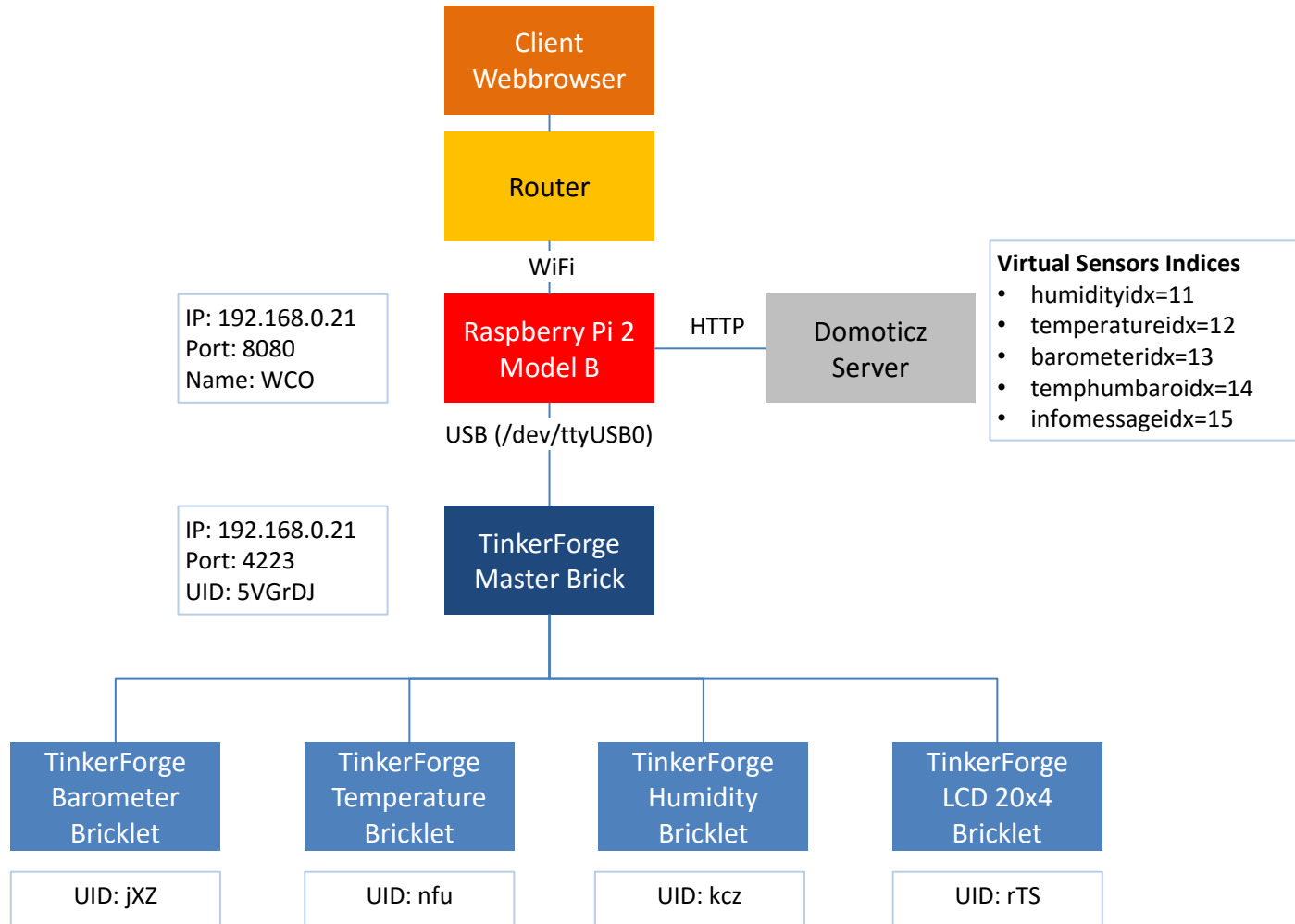
Objectives

Show Date & Time, Air Pressure, Temperature and Humidity on a LCD 20x4 and on Webbrowser Domoticz Client.

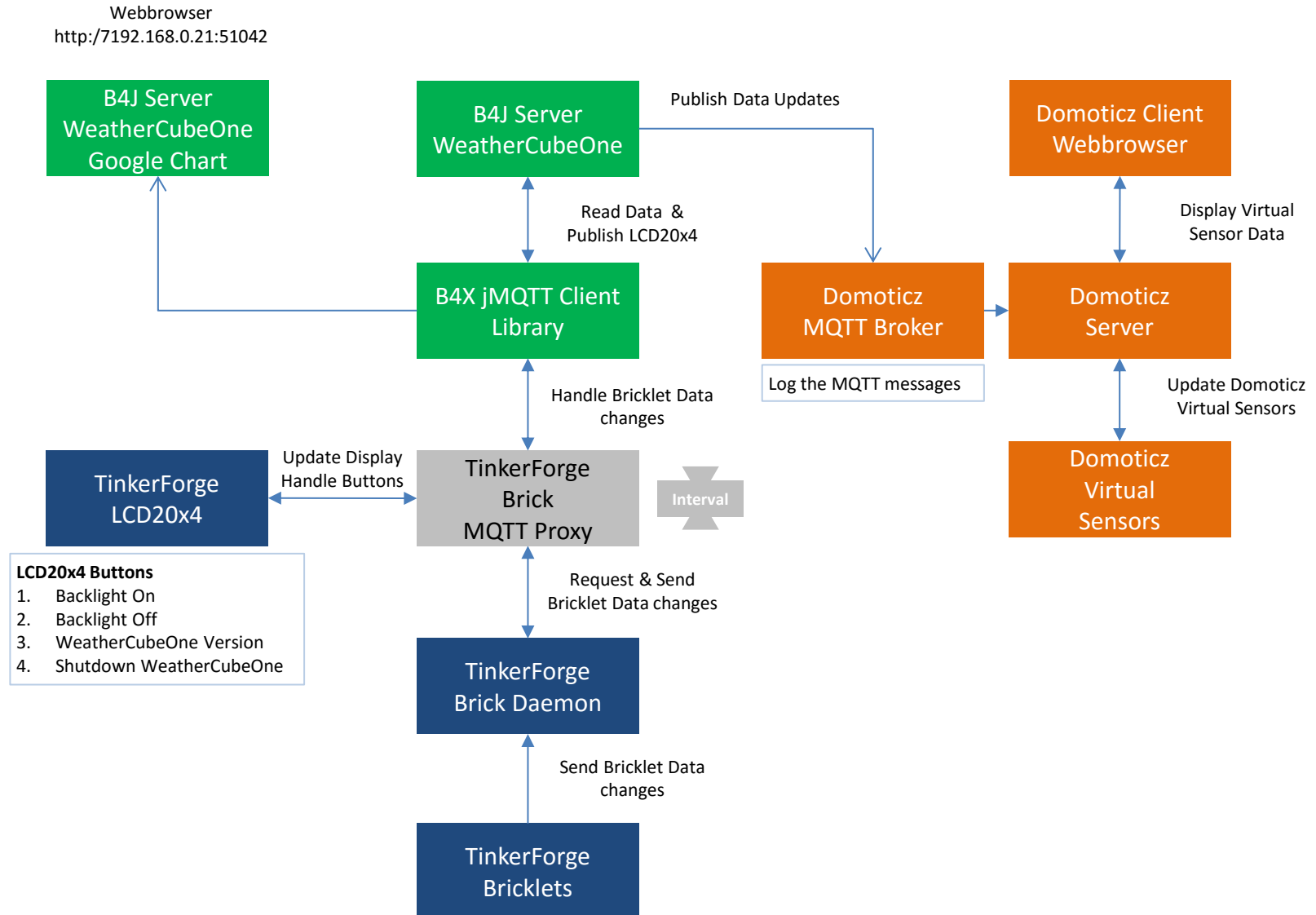


| Hardware | Software | LCD20x4 Buttons |
|---|--|---|
| <ul style="list-style-type: none">Raspberry Pi 2 Model B v1.1TinkerForge Master BrickTinkerForge Bricklets Temperature Barometer, Humidity and LCD20x4MakerBeam Aluminium Profiles | <ul style="list-style-type: none">TinkerForge Brick MQTT ProxyB4X MQTT Client LibraryDomoticz MQTTDomoticz Home Automation ServerB4J Non-UI Application WeatherCubeOne (developed by www.rwblinn.de) | <ol style="list-style-type: none">Backlight OnBacklight OffWeatherCubeOne VersionShutdown WeatherCubeOne |

WeatherCubeOne2 - Hardware Setup



WeatherCubeOne2 - Processes



The B4J servers are Non-UI Applications

WeatherCubeOne2 - Domoticz Dashboard

2015-10-29 11:55:00 ▲07:15 ▼16:53

Temperature Sensors:

Humidity **53%**
Comfortable
Last Seen: 2015-10-29 11:54:06

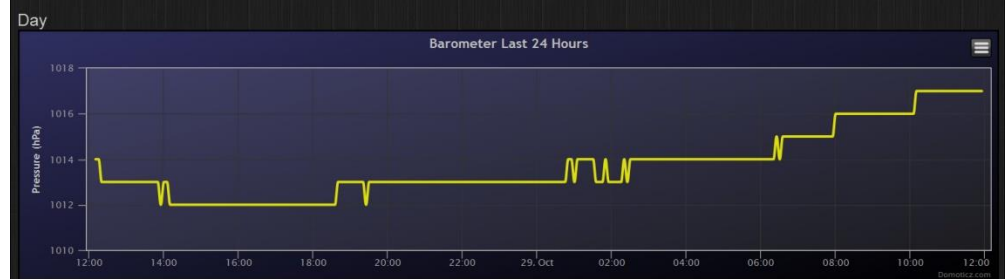
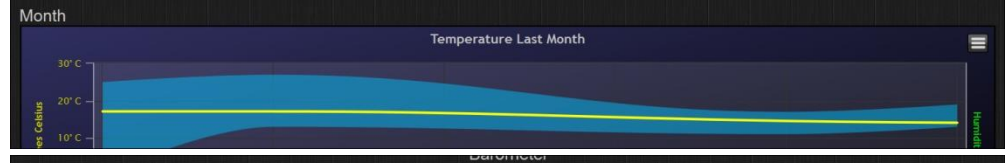
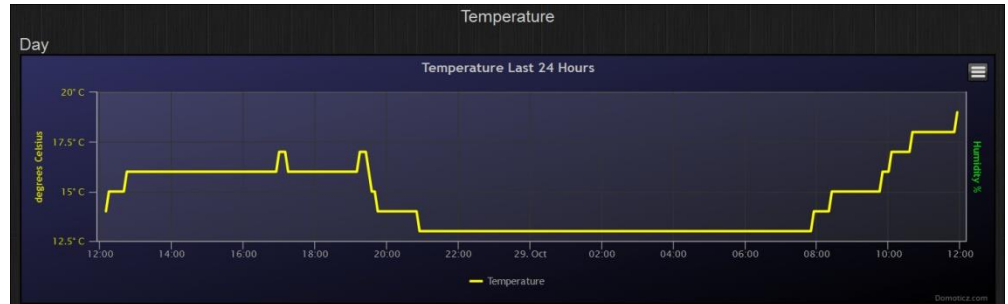
Temperature **19° C**
Last Seen: 2015-10-29 11:54:06

Weather Sensors:

Barometer **1017 hPa**
1017 hPa, Prediction: Stable
Last Seen: 2015-10-29 11:54:06

Utility Sensors:

WeatherCubeOne Info
Update Domoticz at 29-Oct-2015 11:54
Last Seen: 2015-10-29 11:54:06



RPi Memory Usage **9.87%**

9.87%
Last Seen: 2015-10-29 11:57:09
Type: General, Percentage

Log Edit Notifications

Note: Just some graphs as an example.

WeatherCubeOne2 - Domoticz Devices

| Idx | Hardware | ID | Unit | Name | Type | Sub Type | Data |
|-----|-----------------|----------|------|---------------------|------------------------|--------------------------|--------------------------------------|
| 1 | Motherboard | 0000044C | 1 | RPi Memory Usage | General | Percentage | 19.31% |
| 4 | Motherboard | 0001 | 1 | RasPi CPU | Temp | TFA 30.3133 | 39.5 C |
| 6 | GPIO Port | | 18 | GPIO18 | Lighting 1 | Impuls | Off |
| 7 | Virtual Devices | 82006 | 1 | TextDevice | General | Text | A very warm day |
| 8 | Virtual Devices | 0014057 | 1 | VirtualSwitch | Lighting 2 | AC | Off, Level: 100 % |
| 11 | Virtual Devices | 1405A | 1 | Humidity | Humidity | LaCrosse TX3 | Humidity 66 % |
| 12 | Virtual Devices | 1405B | 1 | Temperature | Temp | THR128/138, THC138 | 24.0 C |
| 13 | Virtual Devices | 00082012 | 1 | Barometer | General | Barometer | 0.0 hPa |
| 14 | Virtual Devices | 1405D | 1 | Weather | Temp + Humidity + Baro | THB1 - BTHR918, BTHGN129 | 24.0 C, 66 %, 1009 hPa |
| 15 | Virtual Devices | 00082014 | 1 | WeatherCubeOne Info | General | Text | Sensors updated (Interval=60000 ms). |

Note: The Hardware devices with Idx 6,7,8 are not used and for test purposes only.

WeatherCubeOne2 - MQTT Topics

| Subscribe | Publish |
|----------------------------|-----------------------------|
| weathercubeone/airpressure | weathercubeone/backlighton |
| weathercubeone/timestamp | weathercubeone/backlightoff |
| weathercubeone/temperature | weathercubeone/clear |
| weathercubeone/humidity | weathercubeone/copyright |
| | weathercubeone/close |
| | weathercubeone/shutdown |

Notes

There are additional topics available to direct subscribe or publish to the TinkerForge Master Brick or Bricklets. The same applies for Domoticz.

To be able to use JSON is required.

Learn more from these references:

- TinkerForge Brick MQTT Proxy (http://www.tinkerforge.com/en/doc/Software/Brick_MQTT_Proxy.html)
- B4X MQTT Client Library(<http://www.b4x.com/android/forum/threads/jmqtt-official-mqtt-client.59472>)
- Domoticz MQTT (<http://www.domoticz.com/wiki/MQTT>)

WeatherCubeOne2 - MQTT Communication Example

B4J weathercubeone application – MQTT Topics received from the TinkerForge Broker

The Sub `mqtt_MessageArrived (Topic As String, Payload() As Byte)` handled the incoming messages holding the topic and the payloadstr.
'PayloadStr = BytesToString(Payload, 0, Payload.Length, "utf8")
'Parse the payload string, holding timestamp and value --- if not a command set by pressing one of the LCD buttons
`TimeStampStr = Utils.ConvertUnixTimeStamp(Root.Get("_timestamp"))`
`mqtt.Publish(TopicWeatherCubeOneTimeStamp, TimeStampStr.GetBytes("UTF8"))`
`Temperature = Root.Get("temperature"); Temperature = Temperature / 100; TemperatureStr = Temperature & " °C"`
`mqtt.Publish(TopicWeatherCubeOneTemperature, TemperatureStr.GetBytes("UTF8"))`

B4J weathercubeone application – MQTT Topics Send to Domoticz

'Build the payload which is Domoticz JSON API conform
`PayLoadStr = "{" & DomoticzTemperatureIdx & ", " & nvalue & ", " & svalue & " & Temperature & "}"`
'Publish the payload accordingly - The topic `domoticz/in` is defined as "`domoticz/in`" (see Domoticz JSON/API documentation)
`mqtt.Publish(TopicDomoticzIn, PayLoadStr.GetBytes("UTF8"))`

Domoticz Log – MQTT Topics received

```
2016-04-16 16:53:45.996 MQTT: Topic: domoticz/in, Message: {"idx":11, "nvalue":54, "svalue":"1"}
2016-04-16 16:53:46.105 MQTT: Topic: domoticz/in, Message: {"idx":15, "nvalue":0, "svalue":"Update Domoticz at 16-Apr-2016 16:53"}
2016-04-16 16:53:47.951 MQTT: Topic: domoticz/in, Message: {"idx":13, "nvalue":0, "svalue":";;;998;0"}
2016-04-16 16:53:48.058 MQTT: Topic: domoticz/in, Message: {"idx":15, "nvalue":0, "svalue":"Update Domoticz at 16-Apr-2016 16:53"}
```


WeatherCubeOne2 - Weather Data on Google Line Charts

Goal

Display Weather Data on Google Line Charts accessible via Webbrowser.

How

The process “weathercubeonegooglechart” is running on the Raspberry Pi to gather data by subscribing to MQTT messages. The data is converted and displayed on line charts.

MQTT Subscribe

Tinkerforge [Topic](#) structure: tinkerforge/<prefix>/<uid>/<suffix>

tinkerforge/bricklet/barometer/jXZ/air_pressure

tinkerforge/bricklet/humidity/kcz/humidity

tinkerforge/bricklet/temperature/nfu/temperature

Access

Via Webbrowser <http://192.168.0.21:51042>

Settings

Various setting in file waethercubeonegooglechart.set.

