

Thinger.IO project contest

Minimalistic Solar battery logger with Thinger.io integration and Weather report

Name:

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Context:

Maker, Home Automation

Title and Description:

Monitoring a solar battery with a gorgeous dashboard environment and Weather report for a minimal cost.

My Raspberry Pi may draw only as little energy as 6W, but it does it 24/24/365.

After one year of continuous operation, it sums up to 52KWh.

In this project the regular power supply is assisted with a 40W solar panel, a cheap PWM Solar controller and 4 LiFePO 10Ah cells.

The solar power is sufficient during summer to power the Raspberry alone, only on upon a few heavily rainy days, we needed mains backup.

Now with winter approaching, we will need mains power more frequently, but anyhow even with a very small 40W panel and an extremely limited investment, the addition will be amortized in less than 3 years.

Hardware Used:

- ESP8266 (\$4)
- One resistor (\$0.05)
- 12V/5V buck controller to power the ESP (\$1)
- Solar panel and PWM controller (50€)

Project Goals:

Being able to remotely monitor a solar charged battery without much cost, verifying the solar contribution.

This project uses an ESP and thingsr.io to log values

The project intends to provide a “no frills” battery logging on a single ESP8366 device (\$4). You just don't need any additional hardware, nor computer, nor gateway, nor subscription.

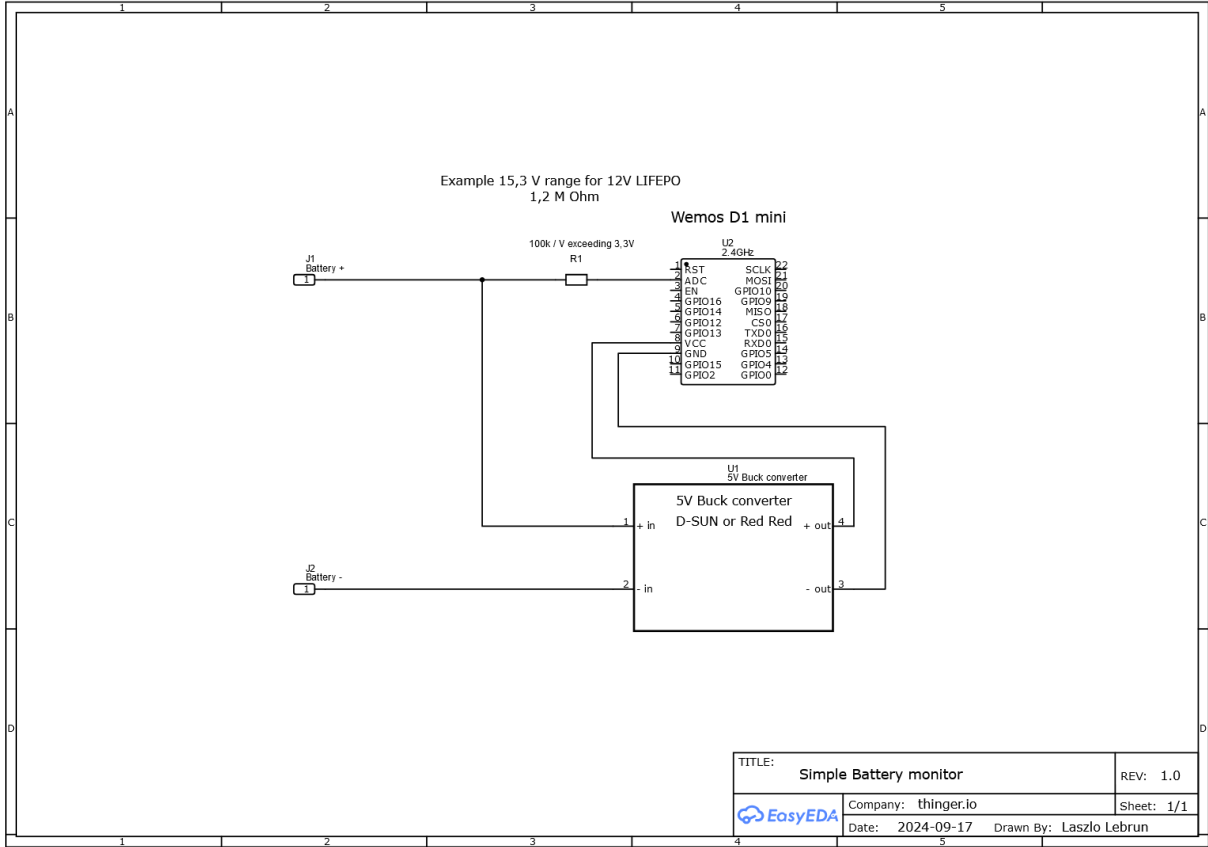
You see a gorgeous dashboard [worldwide on the Internet](#), can download historic data to Excel etc.

Since solar operation is heavily dependent on the weather, the internet service OpenWeatherMaps is integrated in the dashboards.

Additionally, the devices have a Telnet console to control them and provide fall-back logs to a computer (optional, not required).

Implementation Steps:

You just need a small DC/DC converter to provide 5V th the WemosD1 module and a simple resistor to increase the A0 voltage range from 0..3,3V to 0..15,3V which is perfect to monitor a 12V LiFePo battery charged with a low cost PWM solar controller.

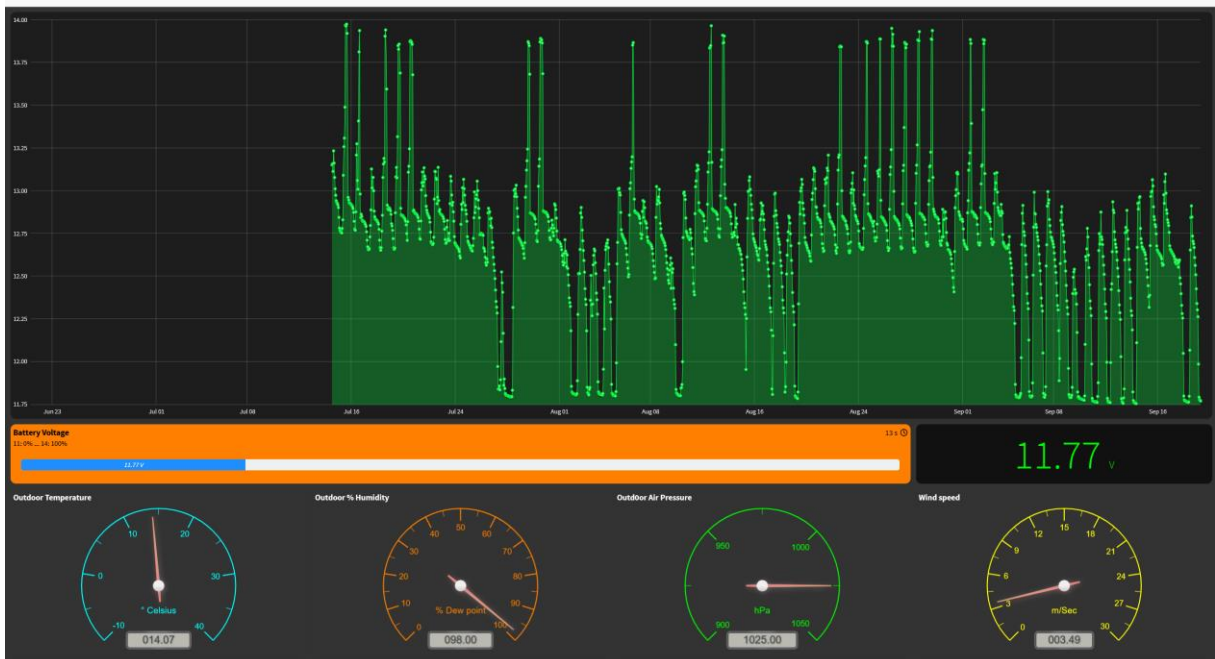


The dashboard's configuration is also provided as JSON file to be uploaded as Developer settings (cf. Attachment)

Screenshots or Videos:
3 month survey, normal.



3 month survey, discharged.



2 days monitoring



Attachments

Json Code for the dashboard to be pasted into the developer view:

```
{
  "controls": {
    "aggregation": {
      "auto": true,
      "period": "1m"
    },
    "timespan": {
      "mode": "relative",
      "period": "latest",
      "value": 2,
      "magnitude": "day"
    }
  },
  "description": "Power Supply Monitoring",
  "name": "Power Supply Monitoring",
  "placeholders": {
    "sources": []
  },
  "properties": {
    "background_image": "#333333",
    "border_radius": "10px",
    "columns": 4
  },
  "tabs": [
    {
      "icon": "fas fa-tachometer-alt",
      "name": "LongTerm",
      "widgets": [
        {
          "layout": {
            "col": 0,
            "row": 0,
            "sizeX": 4,
            "sizeY": 19
          },
          "panel": {
            "color": "#1d1d1d",
            "currentColor": "#1d1d1d",
            "showOffline": {
              "type": "none"
            }
          },
          "properties": {
            "axis": true,

```

```

        "fill": true,
        "legend": false,
        "multiple_axes": false,
        "yaxis": {
            "max": 14,
            "min": 11.75
        }
    },
    "sources": [
        {
            "bucket": {
                "backend": "dynamodb",
                "id": "HOURL",
                "mapping": "BatV",
                "tags": {}
            },
            "color": "#08ef40",
            "name": "Source 1",
            "source": "bucket",
            "timespan": {
                "mode": "configurable"
            }
        }
    ],
    "type": "chart"
},
{
    "layout": {
        "col": 1,
        "row": 22,
        "sizeX": 1,
        "sizeV": 8
    },
    "panel": {
        "color": "#333333",
        "currentColor": "#333333",
        "showOffline": {
            "type": "none"
        }
    },
    "subtitle": "",
    "title": "Outdoor % Humidity"
},
    "properties": {
        "majorTicks": 10,
        "max": 100,
        "min": 0,
        "plateColor": "#333333",
        "showValue": true,
        "textColor": "#ff8000",
        "tickColor": "#ff8000",
        "unit": "% Dew point"
    },
    "sources": [
        {
            "color": "#1abc9c",
            "device_property": {
                "device": "BluSCC",
                "mapping": "humidity",
                "property": "persistence"
            },
            "name": "Source 1",
            "source": "device_property"
        }
    ],
    "type": "tachometer"
},
{
    "layout": {
        "col": 2,
        "row": 22,
        "sizeX": 1,
        "sizeV": 8
    },
    "panel": {
        "color": "#333333",
        "currentColor": "#333333",

```

```

        "showOffline": {
            "type": "none"
        },
        "subtitle": "",
        "title": "Outdoor Air Pressure"
    },
    "properties": {
        "majorTicks": 50,
        "max": 1050,
        "min": 900,
        "plateColor": "#333333",
        "showValue": true,
        "textColor": "#00ff00",
        "tickColor": "#00ff00",
        "unit": "hPa"
    },
    "sources": [
        {
            "color": "#1abc9c",
            "device_property": {
                "device": "BluSCC",
                "mapping": "pressure",
                "property": "persistence"
            },
            "name": "Source 1",
            "source": "device_property"
        }
    ],
    "type": "tachometer"
},
{
    "layout": {
        "col": 3,
        "row": 22,
        "sizeX": 1,
        "sizeY": 8
    },
    "panel": {
        "color": "#333333",
        "currentColor": "#333333",
        "showOffline": {
            "type": "none"
        },
        "subtitle": "",
        "title": "Wind speed"
    },
    "properties": {
        "majorTicks": 3,
        "max": 30,
        "min": 0,
        "plateColor": "#333333",
        "showValue": true,
        "textColor": "#ffff00",
        "tickColor": "#ffff00",
        "unit": "m/Sec"
    },
    "sources": [
        {
            "color": "#1abc9c",
            "device_property": {
                "device": "BluSCC",
                "mapping": "wind",
                "property": "persistence"
            },
            "name": "Source 1",
            "source": "device_property"
        }
    ],
    "type": "tachometer"
},
{
    "layout": {
        "col": 0,
        "row": 22,
        "sizeX": 1,
        "sizeY": 8
    }
}

```

```

    },
    "panel": {
      "color": "#333333",
      "currentColor": "#333333",
      "showOffline": {
        "type": "none"
      },
      "subtitle": "",
      "title": "Outdoor Temperature"
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    "properties": {
      "majorTicks": 10,
      "max": 40,
      "min": -10,
      "plateColor": "#333333",
      "showValue": true,
      "textColor": "#00ffff",
      "tickColor": "#00ffff",
      "unit": "° Celsius"
    },
    "sources": [
      {
        "color": "#1abc9c",
        "device_property": {
          "device": "BluSCC",
          "mapping": "temperature",
          "property": "persistence"
        },
        "name": "Source 1",
        "source": "device_property"
      }
    ],
    "type": "tachometer"
  },
  {
    "layout": {
      "col": 0,
      "row": 19,
      "sizeX": 3,
      "sizeY": 3
    },
    "panel": {
      "color": "#ffffff",
      "colors": [
        {
          "color": "#ff0000",
          "max": 11,
          "min": 0
        },
        {
          "color": "#ff8000",
          "max": 12,
          "min": 11
        },
        {
          "color": "#ffff00",
          "max": 12.5,
          "min": 12
        },
        {
          "color": "#00c100",
          "max": 14,
          "min": 12.5
        },
        {
          "color": "#ff0000",
          "max": 20,
          "min": 14
        }
      ],
      "currentColor": "#ffffff",
      "showOffline": {
        "type": "none"
      },
      "showTs": true,
      "subtitle": "11: 0% ... 14: 100%",

```

```

        "title": "Battery Voltage"
    },
    "properties": {
        "icon": "",
        "iconSize": "",
        "max": 14,
        "min": 11,
        "unit": "V"
    },
    "sources": [
        {
            "color": "#1abc9c",
            "device": {
                "id": "BluSCC",
                "interval": 5,
                "mapping": "BatV",
                "resource": "measure",
                "update": "interval"
            },
            "name": "Source 1",
            "source": "device"
        }
    ],
    "type": "progressbar"
},
{
    "layout": {
        "col": 3,
        "row": 19,
        "sizeX": 1,
        "sizeY": 3
    },
    "panel": {
        "color": "#111111",
        "currentColor": "#111111",
        "showOffline": {
            "type": "none"
        }
    },
    "properties": {
        "color": "#00fb00",
        "decimal_places": 2,
        "icon": "",
        "size": "75px",
        "unit": "V",
        "unit_size": "20px",
        "weight": "font-thin"
    },
    "sources": [
        {
            "color": "#1abc9c",
            "device": {
                "id": "BluSCC",
                "interval": 300,
                "mapping": "BatV",
                "resource": "measure",
                "update": "interval"
            },
            "name": "Source 1",
            "source": "device"
        }
    ],
    "type": "text"
}
]
},
],
"widgets": [
    {
        "data": {
            "bucket": {
                "backend": "dynamodb",
                "id": "HOUR",
                "mapping": [
                    "voltage",
                    "current"
                ]
            }
        }
    }
]
}

```



```

        ],
        "user": "rin67630"
    },
    "source": "bucket"
},
"layout": {
    "col": 0,
    "row": 0,
    "sizeX": 6,
    "sizeY": 13
},
"panel": {
    "color": "#ffffff"
},
"properties": {
    "axis": true,
    "color": {
        "current": "#026cee",
        "temperature": "#ef0701",
        "voltage": "#23d004"
    },
    "fill": true,
    "legend": true,
    "multiple_axes": true,
    "timespan": {
        "magnitude": "month",
        "mode": "relative",
        "period": "latest",
        "value": 1
    }
},
"type": "chart"
},
{
    "data": {
        "bucket": {
            "backend": "dynamodb",
            "id": "DAY",
            "mapping": [
                "BV@0h",
                "BAhDay"
            ],
            "user": "rin67630"
        },
        "source": "bucket"
    },
    "layout": {
        "col": 0,
        "row": 13,
        "sizeX": 6,
        "sizeY": 12
    },
    "panel": {
        "color": "#ffffff"
    },
    "properties": {
        "axis": true,
        "color": {
            "BAhDay": "#2475d7",
            "BV@0h": "#1ed004"
        },
        "fill": true,
        "legend": true,
        "multiple_axes": true,
        "timespan": {
            "magnitude": "month",
            "mode": "relative",
            "period": "latest",
            "value": 1
        }
    },
    "type": "chart"
},
{
    "data": {
        "device": {

```

```

        "id": "DFLD20_04_CL1",
        "interval": 3,
        "mapping": "power",
        "resource": "energy",
        "update": "interval",
        "user": "rin67630"
    },
    "source": "device"
},
"layout": {
    "col": 2,
    "row": 25,
    "sizeX": 1,
    "sizeY": 5
},
"panel": {
    "color": "#ffffff"
},
"properties": {
    "color": "#1E313E",
    "decimal_places": 2,
    "icon": "",
    "size": "75px",
    "unit": "W",
    "unit_size": "20px",
    "weight": "font-thin"
},
"type": "text"
},
{
    "data": {
        "device": {
            "id": "DFLD20_04_CL1",
            "interval": 3,
            "mapping": "voltage",
            "resource": "energy",
            "update": "interval",
            "user": "rin67630"
        },
        "source": "device"
    },
    "layout": {
        "col": 0,
        "row": 25,
        "sizeX": 1,
        "sizeY": 5
    },
    "panel": {
        "color": "#ffffff"
    },
    "properties": {
        "color": "#1E313E",
        "decimal_places": 2,
        "icon": "",
        "size": "75px",
        "unit": "V",
        "unit_size": "20px",
        "weight": "font-thin"
    },
    "type": "text"
},
{
    "data": {
        "device": {
            "id": "DFLD20_04_CL1",
            "interval": 3,
            "mapping": "current",
            "resource": "energy",
            "update": "interval",
            "user": "rin67630"
        },
        "source": "device"
    },
    "layout": {
        "col": 1,
        "row": 25,

```

```
        "sizeX": 1,  
        "sizeY": 5  
    },  
    "panel": {  
        "color": "#ffffff"  
    },  
    "properties": {  
        "color": "#1E313E",  
        "decimal_places": 3,  
        "icon": "",  
        "size": "75px",  
        "unit": "A",  
        "unit_size": "20px",  
        "weight": "font-thin"  
    },  
    "type": "text"  
} ]  
}
```