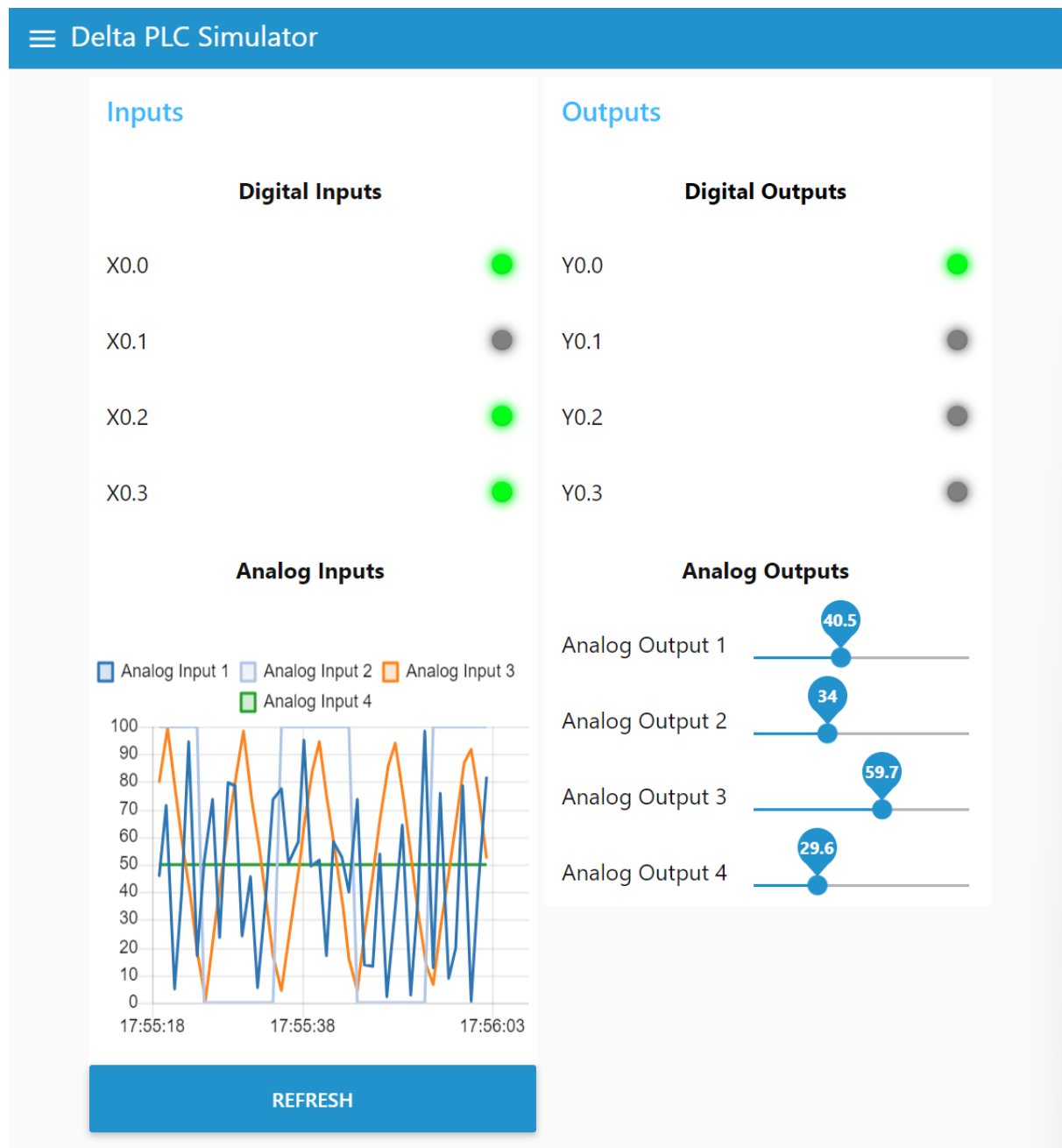


Node-RED Flows

Feel free to use the Node-RED flows used in the tutorial.

PLC Simulator dashboard with Digital and Analog IOs



You can copy the code below and import it in the Node-RED

```
[
  {
    "id": "b96cdc361cfc4b61",
    "type": "tab",
    "label": "Flow 1",
    "disabled": true,
    "info": "",
    "env": []
  },
  {
    "id": "e74f6eb3b15e5353",
    "type": "inject",
    "z": "b96cdc361cfc4b61",
    "name": "",
    "props": [
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        "p": "payload"
      },
      {
        "p": "topic",
        "vt": "str"
      }
    ],
    "repeat": "1",
    "crontab": "",
    "once": false,
    "onceDelay": 0.1,
    "topic": "",
    "payload": "",
    "payloadType": "date",
    "x": 190,
    "y": 660,
    "wires": [
      [
        "30916162541977ab",
        "1fdc119d902978c7",
        "68f14100ea831837",
        "0e9d293b67b8ae87"
      ]
    ]
  },
  {
    "id": "30916162541977ab",
    "type": "modbus-getter",
    "z": "b96cdc361cfc4b61",
```

```

    "name": "Analog Input 1",
    "showStatusActivities": false,
    "showErrors": false,
    "showWarnings": true,
    "logIOActivities": false,
    "unitid": "",
    "dataType": "HoldingRegister",
    "adr": "0",
    "quantity": "2",
    "server": "2c1200c61acb0c9c",
    "useIOFile": false,
    "ioFile": "",
    "useIOForPayload": false,
    "emptyMsgOnFail": false,
    "keepMsgProperties": false,
    "delayOnStart": false,
    "startDelayTime": "",
    "x": 400,
    "y": 600,
    "wires": [
      [
        "c90d0cb147c0c7f8"
      ],
      []
    ]
  },
  {
    "id": "6c3244d6f3e68dcb",
    "type": "debug",
    "z": "b96cdc361cfc4b61",
    "name": "debug 2",
    "active": false,
    "tosidebar": true,
    "console": false,
    "tostatus": false,
    "complete": "false",
    "statusVal": "",
    "statusType": "auto",
    "x": 1000,
    "y": 600,
    "wires": []
  },
  {
    "id": "c90d0cb147c0c7f8",
    "type": "function",
    "z": "b96cdc361cfc4b61",
    "name": "Convert to REAL",

```

```

"func": "//Creates a new ArrayBuffer with a size of 4 bytes.\nvar buf = new
ArrayBuffer(4);//0,1,2,3\n\n/*A DataView is created for the ArrayBuffer. \nDataView
provides a low-level interface for reading and \nwriting multiple number types in the
ArrayBuffer, *\nvar view = new DataView(buf);\n\n//Write the ints to
it\nview.setUint16(0, msg.payload[1]);\nview.setUint16(2, msg.payload[0]);\n\n/*Here, the
code is reading the data in the buffer \nas a 32-bit floating point number (Float32),
\nstarting from byte position 0.*\nvar num = view.getFloat32(0);\n\n//Done\nmsg.topic =
\"Analog Input 1\";\nmsg.payload = Number(num.toFixed(2));\nreturn msg;";

```

```

    "outputs": 1,
    "timeout": "",
    "noerr": 0,
    "initialize": "",
    "finalize": "",
    "libs": [],
    "x": 630,
    "y": 600,
    "wires": [
      [
        "6c3244d6f3e68dcb",
        "5404a65c4126f6ff"
      ]
    ]
  },
  {
    "id": "1fdc119d902978c7",
    "type": "modbus-getter",
    "z": "b96cdc361cfc4b61",
    "name": "Analog Input 2",
    "showStatusActivities": false,
    "showErrors": false,
    "showWarnings": true,
    "logIOActivities": false,
    "unitid": "",
    "dataType": "HoldingRegister",
    "adr": "2",
    "quantity": "2",
    "server": "2c1200c61acb0c9c",
    "useIOFile": false,
    "ioFile": "",
    "useIOForPayload": false,
    "emptyMsgOnFail": false,
    "keepMsgProperties": false,
    "delayOnStart": false,
    "startDelayTime": "",
    "x": 400,
    "y": 660,
    "wires": [

```

```

    [
      "066c21636766c91e"
    ],
    []
  ]
},
{
  "id": "c38c42bad3fea623",
  "type": "debug",
  "z": "b96cdc361cfc4b61",
  "name": "debug 16",
  "active": false,
  "tosidebar": true,
  "console": false,
  "tostatus": false,
  "complete": "false",
  "statusVal": "",
  "statusType": "auto",
  "x": 1000,
  "y": 660,
  "wires": []
},
{
  "id": "066c21636766c91e",
  "type": "function",
  "z": "b96cdc361cfc4b61",
  "name": "Convert to REAL",
  "func": "//Creates a new ArrayBuffer with a size of 4 bytes.\nvar buf = new\nArrayBuffer(4);//0,1,2,3\n\n/*A DataView is created for the ArrayBuffer. \nDataView\nprovides a low-level interface for reading and \nwriting multiple number types in the\nArrayBuffer, *\nvar view = new DataView(buf);\n\n//Write the ints to\nit\nview.setUint16(0, msg.payload[1]);\nview.setUint16(2, msg.payload[0]);\n\n/*Here, the\ncode is reading the data in the buffer \nas a 32-bit floating point number (Float32),\n\nstarting from byte position 0.*\nvar num = view.getFloat32(0);\n\n//Done\nmsg.topic =\n\"Analog Input 2\";\nmsg.payload = Number(num.toFixed(2));\nreturn msg;",
  "outputs": 1,
  "timeout": "",
  "noerr": 0,
  "initialize": "",
  "finalize": "",
  "libs": [],
  "x": 630,
  "y": 660,
  "wires": [
    [
      "c38c42bad3fea623",
      "5404a65c4126f6ff"
    ]
  ]
}

```

```

    ]
  ]
},
{
  "id": "b09afe86b7ae171e",
  "type": "comment",
  "z": "b96cdc361cfc4b61",
  "name": "Modbus to REAL",
  "info": "",
  "x": 620,
  "y": 560,
  "wires": []
},
{
  "id": "8619ee6000e4e6f6",
  "type": "modbus-write",
  "z": "b96cdc361cfc4b61",
  "name": "",
  "showStatusActivities": false,
  "showErrors": false,
  "showWarnings": true,
  "unitid": "",
  "dataType": "MHoldingRegisters",
  "adr": "8",
  "quantity": "2",
  "server": "2c1200c61acb0c9c",
  "emptyMsgOnFail": false,
  "keepMsgProperties": false,
  "delayOnStart": false,
  "startDelayTime": "",
  "x": 780,
  "y": 1020,
  "wires": [
    [],
    []
  ]
},
{
  "id": "c11112ec8a8f3a0a",
  "type": "debug",
  "z": "b96cdc361cfc4b61",
  "name": "debug 17",
  "active": false,
  "tosidebar": true,
  "console": false,
  "tostatus": false,
  "complete": "false",

```

```

    "statusVal": "",
    "statusType": "auto",
    "x": 760,
    "y": 1080,
    "wires": []
  },
  {
    "id": "8f829316aa898f5d",
    "type": "function",
    "z": "b96cdc361cfc4b61",
    "name": "function 12",
    "func": "// Step 1: Create a buffer and a data view\nvar buf = new ArrayBuffer(4);\nvar\nview = new DataView(buf);\n\n// Step 2: Write the floating-point number as a 32-bit\nfloat\nvar floatNumber = msg.payload;\nview.setFloat32(0, floatNumber);\n\n// Step 3:\nRead the buffer as two 16-bit integers with byte swap\nvar int16_1 =\nview.getUint16(2);\nvar int16_2 = view.getUint16(0);\n\n// The result is an array of two 16-\nbit integers\nmsg.payload = [int16_1, int16_2];\nreturn msg;",
    "outputs": 1,
    "timeout": "",
    "noerr": 0,
    "initialize": "",
    "finalize": "",
    "libs": [],
    "x": 410,
    "y": 1140,
    "wires": [
      [
        "bf028146cedf6a25",
        "d220ee362da79159"
      ]
    ]
  },
  {
    "id": "bf028146cedf6a25",
    "type": "modbus-write",
    "z": "b96cdc361cfc4b61",
    "name": "",
    "showStatusActivities": false,
    "showErrors": false,
    "showWarnings": true,
    "unitid": "",
    "dataType": "MHoldingRegisters",
    "adr": "10",
    "quantity": "2",
    "server": "2c1200c61acb0c9c",
    "emptyMsgOnFail": false,
    "keepMsgProperties": false,

```

```

    "delayOnStart": false,
    "startDelayTime": "",
    "x": 780,
    "y": 1140,
    "wires": [
        [],
        []
    ]
},
{
    "id": "d220ee362da79159",
    "type": "debug",
    "z": "b96cdc361cfc4b61",
    "name": "debug 18",
    "active": false,
    "tosidebar": true,
    "console": false,
    "tostatus": false,
    "complete": "false",
    "statusVal": "",
    "statusType": "auto",
    "x": 760,
    "y": 1200,
    "wires": []
},
{
    "id": "68f14100ea831837",
    "type": "modbus-getter",
    "z": "b96cdc361cfc4b61",
    "name": "Analog Input 3",
    "showStatusActivities": false,
    "showErrors": false,
    "showWarnings": true,
    "logIOActivities": false,
    "unitid": "",
    "dataType": "HoldingRegister",
    "adr": "4",
    "quantity": "2",
    "server": "2c1200c61acb0c9c",
    "useIOFile": false,
    "ioFile": "",
    "useIOForPayload": false,
    "emptyMsgOnFail": false,
    "keepMsgProperties": false,
    "delayOnStart": false,
    "startDelayTime": "",
    "x": 400,

```



```

    "y": 740,
    "wires": [
      [
        "3c02834dbd5e5bff"
      ],
      []
    ]
  },
  {
    "id": "c809b43540297a13",
    "type": "debug",
    "z": "b96cdc361cfc4b61",
    "name": "debug 19",
    "active": false,
    "tosidebar": true,
    "console": false,
    "tostatus": false,
    "complete": "false",
    "statusVal": "",
    "statusType": "auto",
    "x": 1000,
    "y": 740,
    "wires": []
  },
  {
    "id": "3c02834dbd5e5bff",
    "type": "function",
    "z": "b96cdc361cfc4b61",
    "name": "Convert to REAL",
    "func": "//Creates a new ArrayBuffer with a size of 4 bytes.\nvar buf = new\nArrayBuffer(4);//0,1,2,3\n\n/*A DataView is created for the ArrayBuffer. \nDataView\nprovides a low-level interface for reading and \nwriting multiple number types in the\nArrayBuffer, */\nvar view = new DataView(buf);\n\n//Write the ints to\nit\nview.setUint16(0, msg.payload[1]);\nview.setUint16(2, msg.payload[0]);\n\n/*Here, the\ncode is reading the data in the buffer \nas a 32-bit floating point number (Float32),\n\nstarting from byte position 0.*/\nvar num = view.getFloat32(0);\n\n//Done\nmsg.topic =\n\"Analog Input 3\";\nmsg.payload = Number(num.toFixed(2));\nreturn msg;\",\n    "outputs": 1,\n    "timeout": "",\n    "noerr": 0,\n    "initialize": "",\n    "finalize": "",\n    "libs": [],\n    "x": 630,\n    "y": 740,\n    "wires": [
      [

```

```

        "c809b43540297a13",
        "5404a65c4126f6ff"
    ]
}
{
    "id": "0e9d293b67b8ae87",
    "type": "modbus-getter",
    "z": "b96cdc361cfc4b61",
    "name": "Analog Input 4",
    "showStatusActivities": false,
    "showErrors": false,
    "showWarnings": true,
    "logIOActivities": false,
    "unitid": "",
    "dataType": "HoldingRegister",
    "adr": "6",
    "quantity": "2",
    "server": "2c1200c61acb0c9c",
    "useIOFile": false,
    "ioFile": "",
    "useIOForPayload": false,
    "emptyMsgOnFail": false,
    "keepMsgProperties": false,
    "delayOnStart": false,
    "startDelayTime": "",
    "x": 400,
    "y": 800,
    "wires": [
        [
            "165fb384da853fe7"
        ],
        []
    ]
},
{
    "id": "51b838f43a4fac69",
    "type": "debug",
    "z": "b96cdc361cfc4b61",
    "name": "debug 20",
    "active": false,
    "tosidebar": true,
    "console": false,
    "tostatus": false,
    "complete": "false",
    "statusVal": "",
    "statusType": "auto",

```

```

    "x": 1000,
    "y": 800,
    "wires": []
  },
  {
    "id": "165fb384da853fe7",
    "type": "function",
    "z": "b96cdc361cfc4b61",
    "name": "Convert to REAL",
    "func": "//Creates a new ArrayBuffer with a size of 4 bytes.\nvar buf = new\nArrayBuffer(4);//0,1,2,3\n\n/*A DataView is created for the ArrayBuffer. \nDataView\nprovides a low-level interface for reading and \nwriting multiple number types in the\nArrayBuffer, *\nvar view = new DataView(buf);\n\n//Write the ints to\nit\nview.setUint16(0, msg.payload[1]);\nview.setUint16(2, msg.payload[0]);\n\n/*Here, the\ncode is reading the data in the buffer \nas a 32-bit floating point number (Float32),\n\nstarting from byte position 0.*\nvar num = view.getFloat32(0);\n\n//Done\nmsg.topic =\n\"Analog Input 4\";\nmsg.payload = Number(num.toFixed(2));\nreturn msg;\",\n    "outputs": 1,\n    "timeout": "",\n    "noerr": 0,\n    "initialize": "",\n    "finalize": "",\n    "libs": [],\n    "x": 630,\n    "y": 800,\n    "wires": [\n      [\n        "51b838f43a4fac69",\n        "5404a65c4126f6ff"\n      ]\n    ]\n  },\n  {\n    "id": "41792e643e540755",\n    "type": "ui_led",\n    "z": "b96cdc361cfc4b61",\n    "order": 2,\n    "group": "d33f5be9621178a8",\n    "width": 0,\n    "height": 0,\n    "label": "X0.0",\n    "labelPlacement": "left",\n    "labelAlignment": "left",\n    "colorForValue": [\n      {\n        "color": "#808080",\n        "value": "false",

```

```

        "valueType": "bool"
    },
    {
        "color": "#00ff00",
        "value": "true",
        "valueType": "bool"
    }
],
"allowColorForValueInMessage": false,
"shape": "circle",
"showGlow": true,
"name": "X0.0",
"x": 750,
"y": 100,
"wires": []
},
{
    "id": "5404a65c4126f6ff",
    "type": "ui_chart",
    "z": "b96cdc361cfc4b61",
    "name": "",
    "group": "d33f5be9621178a8",
    "order": 7,
    "width": "6",
    "height": "6",
    "label": "",
    "chartType": "line",
    "legend": "true",
    "xformat": "HH:mm:ss",
    "interpolate": "linear",
    "nodata": "",
    "dot": false,
    "ymin": "",
    "ymax": "",
    "removeOlder": 1,
    "removeOlderPoints": "50",
    "removeOlderUnit": "60",
    "cutout": 0,
    "useOneColor": false,
    "useUTC": false,
    "colors": [
        "#1f77b4",
        "#aec7e8",
        "#ff7f0e",
        "#2ca02c",
        "#98df8a",
        "#d62728",

```

```

        "#ff9896",
        "#9467bd",
        "#c5b0d5"
    ],
    "outputs": 1,
    "useDifferentColor": false,
    "className": "",
    "x": 830,
    "y": 700,
    "wires": [
        []
    ]
},
{
    "id": "0c8d6e322fb01eaf",
    "type": "ui_button",
    "z": "b96cdc361cfc4b61",
    "name": "",
    "group": "d33f5be9621178a8",
    "order": 8,
    "width": 0,
    "height": 0,
    "passthru": false,
    "label": "Refresh",
    "tooltip": "",
    "color": "",
    "bgcolor": "",
    "className": "",
    "icon": "",
    "payload": "[]",
    "payloadType": "json",
    "topic": "topic",
    "topicType": "msg",
    "x": 660,
    "y": 700,
    "wires": [
        [
            "5404a65c4126f6ff"
        ]
    ]
},
{
    "id": "b6a784de3913e651",
    "type": "ui_slider",
    "z": "b96cdc361cfc4b61",
    "name": "",
    "label": "Analog Output 1",

```

```

    "tooltip": "",
    "group": "76ee9b2e584bf058",
    "order": 7,
    "width": 0,
    "height": 0,
    "passthru": true,
    "outs": "end",
    "topic": "topic",
    "topicType": "msg",
    "min": 0,
    "max": "100",
    "step": "0.1",
    "className": "",
    "x": 160,
    "y": 1020,
    "wires": [
      [
        "3706e519e4c26543"
      ]
    ]
  },
  {
    "id": "da670bf370465664",
    "type": "ui_slider",
    "z": "b96cdc361cfc4b61",
    "name": "",
    "label": "Analog Output 2",
    "tooltip": "",
    "group": "76ee9b2e584bf058",
    "order": 8,
    "width": 0,
    "height": 0,
    "passthru": true,
    "outs": "end",
    "topic": "topic",
    "topicType": "msg",
    "min": 0,
    "max": "100",
    "step": "0.1",
    "className": "",
    "x": 160,
    "y": 1140,
    "wires": [
      [
        "8f829316aa898f5d"
      ]
    ]
  }
]

```

```

},
{
  "id": "f9eebb269e4ee7f9",
  "type": "function",
  "z": "b96cdc361cfc4b61",
  "name": "function 13",
  "func": "// Step 1: Create a buffer and a data view\nvar buf = new ArrayBuffer(4);\nvar\nview = new DataView(buf);\n\n// Step 2: Write the floating-point number as a 32-bit\nfloat\nvar floatNumber = msg.payload;\nview.setFloat32(0, floatNumber);\n\n// Step 3:\nRead the buffer as two 16-bit integers with byte swap\nvar int16_1 =\nview.getUint16(2);\nvar int16_2 = view.getUint16(0);\n\n// The result is an array of two 16-\nbit integers\nmsg.payload = [int16_1, int16_2];\nreturn msg;",
  "outputs": 1,
  "timeout": "",
  "noerr": 0,
  "initialize": "",
  "finalize": "",
  "libs": [],
  "x": 410,
  "y": 1260,
  "wires": [
    [
      "d9dba78b91972f34",
      "3aaf47843452f23e"
    ]
  ]
},
{
  "id": "d9dba78b91972f34",
  "type": "modbus-write",
  "z": "b96cdc361cfc4b61",
  "name": "",
  "showStatusActivities": false,
  "showErrors": false,
  "showWarnings": true,
  "unitid": "",
  "dataType": "MHoldingRegisters",
  "adr": "12",
  "quantity": "2",
  "server": "2c1200c61acb0c9c",
  "emptyMsgOnFail": false,
  "keepMsgProperties": false,
  "delayOnStart": false,
  "startDelayTime": "",
  "x": 780,
  "y": 1260,
  "wires": [

```

```

        [],
        []
    ]
},
{
    "id": "3aaf47843452f23e",
    "type": "debug",
    "z": "b96cdc361cfc4b61",
    "name": "debug 21",
    "active": false,
    "tosidebar": true,
    "console": false,
    "tostatus": false,
    "complete": "false",
    "statusVal": "",
    "statusType": "auto",
    "x": 760,
    "y": 1320,
    "wires": []
},
{
    "id": "d7b118becd0b4007",
    "type": "ui_slider",
    "z": "b96cdc361cfc4b61",
    "name": "",
    "label": "Analog Output 3",
    "tooltip": "",
    "group": "76ee9b2e584bf058",
    "order": 9,
    "width": 0,
    "height": 0,
    "passthru": true,
    "outs": "end",
    "topic": "topic",
    "topicType": "msg",
    "min": 0,
    "max": "100",
    "step": "0.1",
    "className": "",
    "x": 160,
    "y": 1260,
    "wires": [
        [
            "f9eebb269e4ee7f9"
        ]
    ]
},

```



```

{
  "id": "b9d71fa721c10671",
  "type": "function",
  "z": "b96cdc361cfc4b61",
  "name": "function 14",
  "func": "// Step 1: Create a buffer and a data view\nvar buf = new ArrayBuffer(4);\nvar view = new DataView(buf);\n\n// Step 2: Write the floating-point number as a 32-bit float\nvar floatNumber = msg.payload;\nview.setFloat32(0, floatNumber);\n\n// Step 3: Read the buffer as two 16-bit integers with byte swap\nvar int16_1 = view.getUint16(2);\nvar int16_2 = view.getUint16(0);\n\n// The result is an array of two 16-bit integers\nmsg.payload = [int16_1, int16_2];\nreturn msg;",
  "outputs": 1,
  "timeout": "",
  "noerr": 0,
  "initialize": "",
  "finalize": "",
  "libs": [],
  "x": 410,
  "y": 1380,
  "wires": [
    [
      "292035960fd5b797",
      "09d7438be7e2a145"
    ]
  ]
},
{
  "id": "292035960fd5b797",
  "type": "modbus-write",
  "z": "b96cdc361cfc4b61",
  "name": "",
  "showStatusActivities": false,
  "showErrors": false,
  "showWarnings": true,
  "unitid": "",
  "dataType": "MHoldingRegisters",
  "adr": "14",
  "quantity": "2",
  "server": "2c1200c61acb0c9c",
  "emptyMsgOnFail": false,
  "keepMsgProperties": false,
  "delayOnStart": false,
  "startDelayTime": "",
  "x": 780,
  "y": 1380,
  "wires": [
    []
  ]
}

```

```

    []
  ]
},
{
  "id": "09d7438be7e2a145",
  "type": "debug",
  "z": "b96cdc361cfc4b61",
  "name": "debug 22",
  "active": false,
  "tosidebar": true,
  "console": false,
  "tostatus": false,
  "complete": "false",
  "statusVal": "",
  "statusType": "auto",
  "x": 760,
  "y": 1440,
  "wires": []
},
{
  "id": "3be15c1dae02c375",
  "type": "ui_slider",
  "z": "b96cdc361cfc4b61",
  "name": "",
  "label": "Analog Output 4",
  "tooltip": "",
  "group": "76ee9b2e584bf058",
  "order": 10,
  "width": 0,
  "height": 0,
  "passthru": true,
  "outs": "end",
  "topic": "topic",
  "topicType": "msg",
  "min": 0,
  "max": "100",
  "step": "0.1",
  "className": "",
  "x": 160,
  "y": 1380,
  "wires": [
    [
      "b9d71fa721c10671"
    ]
  ]
},
{

```

```

    "id": "123058607aade4b5",
    "type": "ui_led",
    "z": "b96cdc361cfc4b61",
    "order": 3,
    "group": "d33f5be9621178a8",
    "width": 0,
    "height": 0,
    "label": "X0.1",
    "labelPlacement": "left",
    "labelAlignment": "left",
    "colorForValue": [
      {
        "color": "#808080",
        "value": "false",
        "valueType": "bool"
      },
      {
        "color": "#00ff00",
        "value": "true",
        "valueType": "bool"
      }
    ],
    "allowColorForValueInMessage": false,
    "shape": "circle",
    "showGlow": true,
    "name": "X0.1",
    "x": 750,
    "y": 140,
    "wires": []
  },
  {
    "id": "833ab19b9a4b64c5",
    "type": "ui_led",
    "z": "b96cdc361cfc4b61",
    "order": 4,
    "group": "d33f5be9621178a8",
    "width": 0,
    "height": 0,
    "label": "X0.2",
    "labelPlacement": "left",
    "labelAlignment": "left",
    "colorForValue": [
      {
        "color": "#808080",
        "value": "false",
        "valueType": "bool"
      },
    ],

```

```

    {
      "color": "#00ff00",
      "value": "true",
      "valueType": "bool"
    }
  ],
  "allowColorForValueInMessage": false,
  "shape": "circle",
  "showGlow": true,
  "name": "X0.2",
  "x": 750,
  "y": 180,
  "wires": []
},
{
  "id": "d133ad220b1ec2ca",
  "type": "ui_led",
  "z": "b96cdc361cfc4b61",
  "order": 5,
  "group": "d33f5be9621178a8",
  "width": 0,
  "height": 0,
  "label": "X0.3",
  "labelPlacement": "left",
  "labelAlignment": "left",
  "colorForValue": [
    {
      "color": "#808080",
      "value": "false",
      "valueType": "bool"
    },
    {
      "color": "#00ff00",
      "value": "true",
      "valueType": "bool"
    }
  ],
  "allowColorForValueInMessage": false,
  "shape": "circle",
  "showGlow": true,
  "name": "X0.3",
  "x": 750,
  "y": 220,
  "wires": []
},
{
  "id": "911c31859bb91e67",

```

```

    "type": "inject",
    "z": "b96cdc361cfc4b61",
    "name": "",
    "props": [
      {
        "p": "payload"
      },
      {
        "p": "topic",
        "vt": "str"
      }
    ],
    "repeat": "1",
    "crontab": "",
    "once": false,
    "onceDelay": 0.1,
    "topic": "",
    "payload": "",
    "payloadType": "date",
    "x": 170,
    "y": 160,
    "wires": [
      [
        "b0af22a6ed3bffe7"
      ]
    ]
  },
  {
    "id": "b0af22a6ed3bffe7",
    "type": "modbus-getter",
    "z": "b96cdc361cfc4b61",
    "name": "Digital Inputs",
    "showStatusActivities": false,
    "showErrors": false,
    "showWarnings": true,
    "logIOActivities": false,
    "unitid": "",
    "dataType": "Coil",
    "adr": "0",
    "quantity": "4",
    "server": "2c1200c61acb0c9c",
    "useIOFile": false,
    "ioFile": "",
    "useIOForPayload": false,
    "emptyMsgOnFail": false,
    "keepMsgProperties": false,
    "delayOnStart": false,

```

```

    "startDelayTime": "",
    "x": 370,
    "y": 160,
    "wires": [
      [
        "78ccd129988c6842",
        "936a5b685f307b6f"
      ],
      []
    ]
  },
  {
    "id": "78ccd129988c6842",
    "type": "debug",
    "z": "b96cdc361cfc4b61",
    "name": "debug 23",
    "active": false,
    "tosidebar": true,
    "console": false,
    "tostatus": false,
    "complete": "false",
    "statusVal": "",
    "statusType": "auto",
    "x": 560,
    "y": 100,
    "wires": []
  },
  {
    "id": "936a5b685f307b6f",
    "type": "function",
    "z": "b96cdc361cfc4b61",
    "name": "function 15",
    "func": "var msg1 = {payload:msg.payload[0]}\nvar msg2 = { payload:
msg.payload[1]}\nvar msg3 = { payload: msg.payload[2]}\nvar msg4 = { payload:
msg.payload[3]}\n\nreturn [msg1,msg2,msg3,msg4];",
    "outputs": 4,
    "timeout": 0,
    "noerr": 0,
    "initialize": "",
    "finalize": "",
    "libs": [],
    "x": 570,
    "y": 160,
    "wires": [
      [
        "41792e643e540755"
      ],
    ],
  },

```

```

    [
      "123058607aade4b5"
    ],
    [
      "833ab19b9a4b64c5"
    ],
    [
      "d133ad220b1ec2ca"
    ]
  ]
},
{
  "id": "248f869f6817be44",
  "type": "comment",
  "z": "b96cdc361cfc4b61",
  "name": "Digital Inputs",
  "info": "",
  "x": 150,
  "y": 60,
  "wires": []
},
{
  "id": "b06951eb040805ef",
  "type": "ui_led",
  "z": "b96cdc361cfc4b61",
  "order": 2,
  "group": "76ee9b2e584bf058",
  "width": 0,
  "height": 0,
  "label": "Y0.0",
  "labelPlacement": "left",
  "labelAlignment": "left",
  "colorForValue": [
    {
      "color": "#808080",
      "value": "false",
      "valueType": "bool"
    },
    {
      "color": "#00ff00",
      "value": "true",
      "valueType": "bool"
    }
  ],
  "allowColorForValueInMessage": false,
  "shape": "circle",
  "showGlow": true,

```

```

    "name": "Y0.0",
    "x": 750,
    "y": 320,
    "wires": []
  },
  {
    "id": "9126e4e32714bfa5",
    "type": "ui_led",
    "z": "b96cdc361cfc4b61",
    "order": 3,
    "group": "76ee9b2e584bf058",
    "width": 0,
    "height": 0,
    "label": "Y0.1",
    "labelPlacement": "left",
    "labelAlignment": "left",
    "colorForValue": [
      {
        "color": "#808080",
        "value": "false",
        "valueType": "bool"
      },
      {
        "color": "#00ff00",
        "value": "true",
        "valueType": "bool"
      }
    ],
    "allowColorForValueInMessage": false,
    "shape": "circle",
    "showGlow": true,
    "name": "Y0.1",
    "x": 750,
    "y": 360,
    "wires": []
  },
  {
    "id": "a40abe76711ceda1",
    "type": "ui_led",
    "z": "b96cdc361cfc4b61",
    "order": 4,
    "group": "76ee9b2e584bf058",
    "width": 0,
    "height": 0,
    "label": "Y0.2",
    "labelPlacement": "left",
    "labelAlignment": "left",

```



```

"colorForValue": [
  {
    "color": "#808080",
    "value": "false",
    "valueType": "bool"
  },
  {
    "color": "#00ff00",
    "value": "true",
    "valueType": "bool"
  }
],
"allowColorForValueInMessage": false,
"shape": "circle",
"showGlow": true,
"name": "Y0.2",
"x": 750,
"y": 400,
"wires": []
},
{
  "id": "7de72f3d94c8ec6d",
  "type": "ui_led",
  "z": "b96cdc361cfc4b61",
  "order": 5,
  "group": "76ee9b2e584bf058",
  "width": 0,
  "height": 0,
  "label": "Y0.3",
  "labelPlacement": "left",
  "labelAlignment": "left",
  "colorForValue": [
    {
      "color": "#808080",
      "value": "false",
      "valueType": "bool"
    },
    {
      "color": "#00ff00",
      "value": "true",
      "valueType": "bool"
    }
  ],
  "allowColorForValueInMessage": false,
  "shape": "circle",
  "showGlow": true,
  "name": "Y0.3",

```

```

    "x": 750,
    "y": 440,
    "wires": []
  },
  {
    "id": "42b7a6e9cab59bbb",
    "type": "inject",
    "z": "b96cdc361cfc4b61",
    "name": "",
    "props": [
      {
        "p": "payload"
      },
      {
        "p": "topic",
        "vt": "str"
      }
    ],
    "repeat": "1",
    "crontab": "",
    "once": false,
    "onceDelay": 0.1,
    "topic": "",
    "payload": "",
    "payloadType": "date",
    "x": 170,
    "y": 380,
    "wires": [
      [
        "748675c97642ed1b"
      ]
    ]
  },
  {
    "id": "748675c97642ed1b",
    "type": "modbus-getter",
    "z": "b96cdc361cfc4b61",
    "name": "Digital Inputs",
    "showStatusActivities": false,
    "showErrors": false,
    "showWarnings": true,
    "logIOActivities": false,
    "unitid": "",
    "dataType": "Coil",
    "adr": "16",
    "quantity": "4",
    "server": "2c1200c61acb0c9c",

```

```

    "useIOFile": false,
    "ioFile": "",
    "useIOForPayload": false,
    "emptyMsgOnFail": false,
    "keepMsgProperties": false,
    "delayOnStart": false,
    "startDelayTime": "",
    "x": 370,
    "y": 380,
    "wires": [
      [
        "e47a14df0daed068",
        "1bc76cf186e0db5f"
      ],
      []
    ]
  },
  {
    "id": "e47a14df0daed068",
    "type": "debug",
    "z": "b96cdc361cfc4b61",
    "name": "debug 24",
    "active": false,
    "tosidebar": true,
    "console": false,
    "tostatus": false,
    "complete": "false",
    "statusVal": "",
    "statusType": "auto",
    "x": 560,
    "y": 320,
    "wires": []
  },
  {
    "id": "1bc76cf186e0db5f",
    "type": "function",
    "z": "b96cdc361cfc4b61",
    "name": "function 16",
    "func": "var msg1 = {payload:msg.payload[0]}\nvar msg2 = { payload: msg.payload[1]}\nvar msg3 = { payload: msg.payload[2]}\nvar msg4 = { payload: msg.payload[3]}\n\nreturn [msg1,msg2,msg3,msg4];",
    "outputs": 4,
    "timeout": 0,
    "noerr": 0,
    "initialize": "",
    "finalize": "",
    "libs": [],

```

```
"x": 570,
"y": 380,
"wires": [
  [
    "b06951eb040805ef"
  ],
  [
    "9126e4e32714bfa5"
  ],
  [
    "a40abe76711ceda1"
  ],
  [
    "7de72f3d94c8ec6d"
  ]
]
},
{
  "id": "70a85c927ffdf095",
  "type": "comment",
  "z": "b96cdc361cfc4b61",
  "name": "Digital Outputs",
  "info": "",
  "x": 160,
  "y": 280,
  "wires": []
},
{
  "id": "16380512be79b427",
  "type": "ui_text",
  "z": "b96cdc361cfc4b61",
  "group": "76ee9b2e584bf058",
  "order": 6,
  "width": 0,
  "height": 0,
  "name": "Analog Outputs",
  "label": "",
  "format": "Analog Outputs",
  "layout": "col-center",
  "className": "",
  "style": false,
  "font": "",
  "fontSize": 16,
  "color": "#000000",
  "x": 160,
  "y": 960,
  "wires": []
}
```

```

},
{
  "id": "33494b85a562cc76",
  "type": "ui_text",
  "z": "b96cdc361cfc4b61",
  "group": "d33f5be9621178a8",
  "order": 6,
  "width": 0,
  "height": 0,
  "name": "Analog Inputs",
  "label": "",
  "format": "Analog Inputs",
  "layout": "col-center",
  "className": "",
  "style": false,
  "font": "",
  "fontSize": 16,
  "color": "#000000",
  "x": 160,
  "y": 560,
  "wires": []
},
{
  "id": "081e366482d3471c",
  "type": "ui_text",
  "z": "b96cdc361cfc4b61",
  "group": "76ee9b2e584bf058",
  "order": 1,
  "width": 0,
  "height": 0,
  "name": "Digital Outputs",
  "label": "",
  "format": "Digital Outputs",
  "layout": "col-center",
  "className": "",
  "style": true,
  "font": "",
  "fontSize": 16,
  "color": "#000000",
  "x": 160,
  "y": 320,
  "wires": []
},
{
  "id": "563a7cf88f5ded3b",
  "type": "ui_text",
  "z": "b96cdc361cfc4b61",

```

```

    "group": "d33f5be9621178a8",
    "order": 1,
    "width": 0,
    "height": 0,
    "name": "Digital Inputs",
    "label": "",
    "format": "Digital Inputs",
    "layout": "col-center",
    "className": "",
    "style": false,
    "font": "",
    "fontSize": "18",
    "color": "#000000",
    "x": 150,
    "y": 100,
    "wires": []
  },
  {
    "id": "a9d5f04bcc2ab2f2",
    "type": "comment",
    "z": "b96cdc361cfc4b61",
    "name": "Analog Inputs",
    "info": "",
    "x": 150,
    "y": 520,
    "wires": []
  },
  {
    "id": "6b7532d07171efbe",
    "type": "comment",
    "z": "b96cdc361cfc4b61",
    "name": "Analog Outputs",
    "info": "",
    "x": 160,
    "y": 920,
    "wires": []
  },
  {
    "id": "3706e519e4c26543",
    "type": "function",
    "z": "b96cdc361cfc4b61",
    "name": "function 17",
    "func": "// Step 1: Create a buffer and a data view\nvar buf = new\nArrayBuffer(4);//0,1,2,3\nvar view = new DataView(buf);\n\n// Step 2: Write the floating-\npoint number as a 32-bit float\nvar floatNumber = msg.payload;\nview.setFloat32(0,\nfloatNumber);\n\n// Step 3: Read the buffer as two 16-bit integers with byte swap\nvar

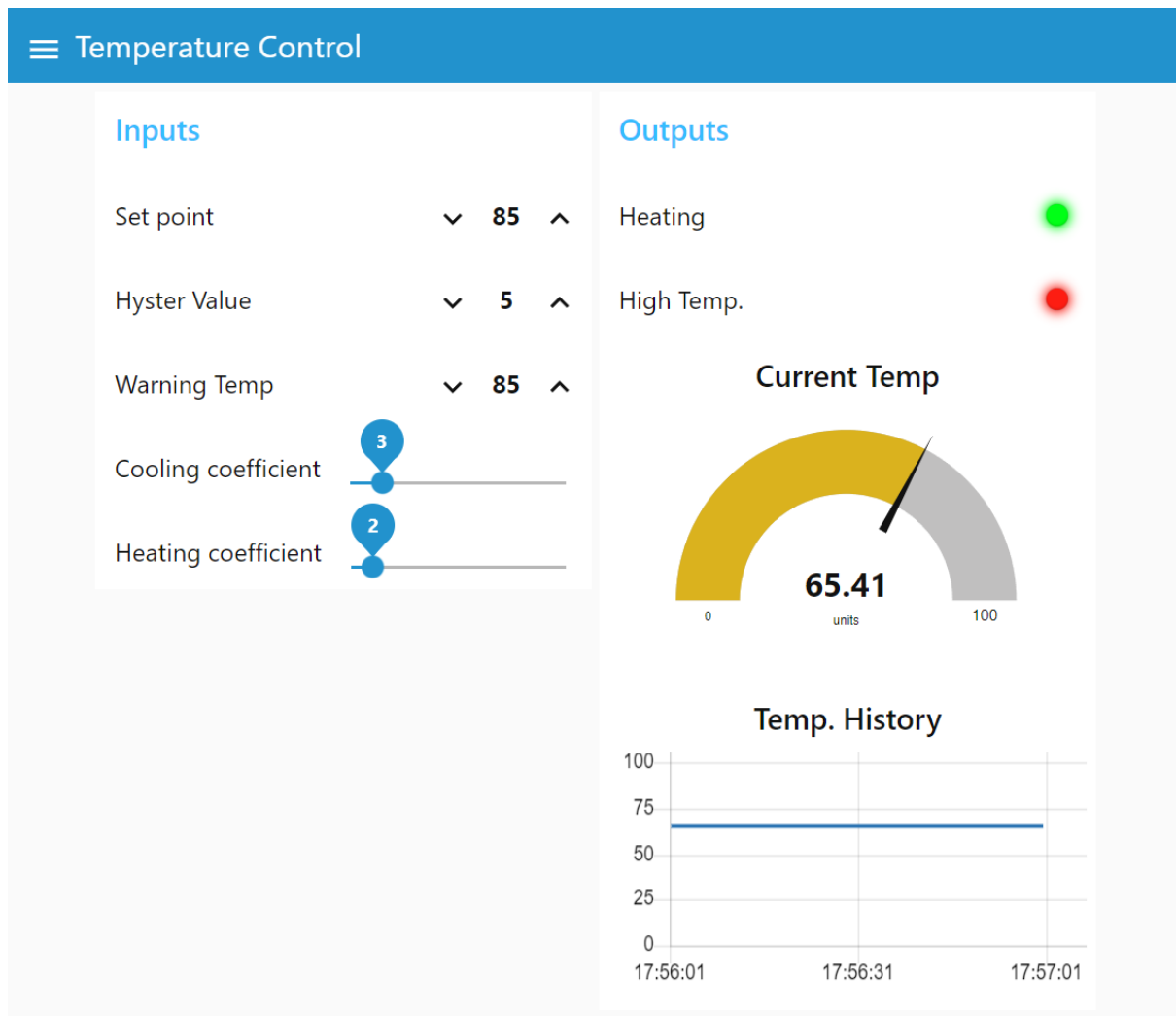
```

int16_1 = view.getUint16(2);\nvar int16_2 = view.getUint16(0);\n\n// The result is an array of two 16-bit integers\nmsg.payload = [int16_1, int16_2];\nreturn msg;",

```
  "outputs": 1,
  "timeout": "",
  "noerr": 0,
  "initialize": "",
  "finalize": "",
  "libs": [],
  "x": 410,
  "y": 1020,
  "wires": [
    [
      "8619ee6000e4e6f6",
      "c11112ec8a8f3a0a"
    ]
  ]
},
{
  "id": "2c1200c61acb0c9c",
  "type": "modbus-client",
  "name": "Delta_simulator",
  "clienttype": "tcp",
  "bufferCommands": true,
  "stateLogEnabled": true,
  "queueLogEnabled": false,
  "failureLogEnabled": true,
  "tcpHost": "127.0.0.1",
  "tcpPort": "10002",
  "tcpType": "DEFAULT",
  "serialPort": "/dev/ttyUSB",
  "serialType": "RTU-BUFFERD",
  "serialBaudrate": "9600",
  "serialDatabits": "8",
  "serialStopbits": "1",
  "serialParity": "none",
  "serialConnectionDelay": "100",
  "serialAsciiResponseStartDelimiter": "0x3A",
  "unit_id": 1,
  "commandDelay": 1,
  "clientTimeout": 1000,
  "reconnectOnTimeout": true,
  "reconnectTimeout": 2000,
  "parallelUnitIdsAllowed": true,
  "showWarnings": true,
  "showLogs": true
},
{
```

```
"id": "d33f5be9621178a8",
"type": "ui_group",
"name": "Inputs",
"tab": "4a71cdd2253f1353",
"order": 1,
"disp": true,
"width": "6",
"collapse": false,
"className": ""
},
{
  "id": "76ee9b2e584bf058",
  "type": "ui_group",
  "name": "Outputs",
  "tab": "4a71cdd2253f1353",
  "order": 2,
  "disp": true,
  "width": "6",
  "collapse": false,
  "className": ""
},
{
  "id": "4a71cdd2253f1353",
  "type": "ui_tab",
  "name": "Delta PLC Simulator",
  "icon": "dashboard",
  "order": 2,
  "disabled": false,
  "hidden": false
}
]
```


Temperature Control dashboard



You can copy the code below and import it in the Node-RED

```
[
  {
    "id": "a5a233b8293b3b76",
    "type": "tab",
    "label": "Flow 2",
    "disabled": false,
    "info": "",
    "env": []
  },
]
```

```
{
  "id": "efed1f6876a42026",
  "type": "inject",
  "z": "a5a233b8293b3b76",
  "name": "",
  "props": [
    {
      "p": "payload"
    },
    {
      "p": "topic",
      "vt": "str"
    }
  ],
  "repeat": "1",
  "crontab": "",
  "once": false,
  "onceDelay": 0.1,
  "topic": "",
  "payload": "",
  "payloadType": "date",
  "x": 170,
  "y": 300,
  "wires": [
    [
      "4414b9927bed9619",
      "3493ca6623585bde"
    ]
  ]
}
```

```
]
},
{
  "id": "3cdcd03b16b7c8cd",
  "type": "comment",
  "z": "a5a233b8293b3b76",
  "name": "Temperature value",
  "info": "",
  "x": 170,
  "y": 260,
  "wires": []
},
{
  "id": "4414b9927bed9619",
  "type": "modbus-getter",
  "z": "a5a233b8293b3b76",
  "name": "Temp real",
  "showStatusActivities": false,
  "showErrors": false,
  "showWarnings": true,
  "logIOActivities": false,
  "unitid": "",
  "dataType": "HoldingRegister",
  "adr": "106",
  "quantity": "2",
  "server": "2c1200c61acb0c9c",
  "useIOFile": false,
  "ioFile": "",
```

```
"useIOForPayload": false,
"emptyMsgOnFail": false,
"keepMsgProperties": false,
"delayOnStart": false,
"startDelayTime": "",
"x": 360,
"y": 300,
"wires": [
  [
    "11a83960a74a3693"
  ],
  []
]
},
{
  "id": "3493ca6623585bde",
  "type": "modbus-getter",
  "z": "a5a233b8293b3b76",
  "name": "Temp int",
  "showStatusActivities": false,
  "showErrors": false,
  "showWarnings": true,
  "logIOActivities": false,
  "unitid": "",
  "dataType": "HoldingRegister",
  "adr": "108",
  "quantity": "1",
  "server": "2c1200c61acb0c9c",
```

```
"useIOFile": false,
"ioFile": "",
"useIOForPayload": false,
"emptyMsgOnFail": false,
"keepMsgProperties": false,
"delayOnStart": false,
"startDelayTime": "",
"x": 360,
"y": 360,
"wires": [
  [
    "16b0b05c3de999bd"
  ],
  []
]
},
{
  "id": "16b0b05c3de999bd",
  "type": "debug",
  "z": "a5a233b8293b3b76",
  "name": "debug 25",
  "active": false,
  "tosidebar": true,
  "console": false,
  "tostatus": false,
  "complete": "false",
  "statusVal": "",
  "statusType": "auto",
```

```

"x": 780,
"y": 360,
"wires": []
},
{
  "id": "2d0c918924e1b538",
  "type": "debug",
  "z": "a5a233b8293b3b76",
  "name": "debug 26",
  "active": false,
  "tosidebar": true,
  "console": false,
  "tostatus": false,
  "complete": "false",
  "statusVal": "",
  "statusType": "auto",
  "x": 800,
  "y": 300,
  "wires": []
},
{
  "id": "11a83960a74a3693",
  "type": "function",
  "z": "a5a233b8293b3b76",
  "name": "Convert to REAL",
  "func": "//Creates a new ArrayBuffer with a size of 4 bytes.\nvar buf = new
ArrayBuffer(4);//0,1,2,3\n\n/*A DataView is created for the ArrayBuffer. \nDataView
provides a low-level interface for reading and \nwriting multiple number types in the
ArrayBuffer, */\nvar view = new DataView(buf);\n\n//Write the ints to it\nview.setUint16(0,

```

```
msg.payload[1]);\nview.setUint16(2, msg.payload[0]);\n\n/*Here, the code is reading the  
data in the buffer \nas a 32-bit floating point number (Float32), \nstarting from byte position  
0.*\nvar num = view.getFloat32(0);\n\n//Done\nmsg.topic = \"Current  
Temp.\";\nmsg.payload = Number(num.toFixed(2));\nreturn msg;
```

```
  "outputs": 1,  
  "timeout": "",  
  "noerr": 0,  
  "initialize": "",  
  "finalize": "",  
  "libs": [],  
  "x": 590,  
  "y": 300,  
  "wires": [  
    [  
      "2d0c918924e1b538",  
      "64cda66473ec13d0",  
      "e83354a0a899b1b5",  
      "11092e60cd5ad91c"  
    ]  
  ]  
},  
{  
  "id": "59902ad7f9a1473c",  
  "type": "comment",  
  "z": "a5a233b8293b3b76",  
  "name": "Heating and High temp",  
  "info": "",  
  "x": 180,  
  "y": 460,
```

```
"wires": []
},
{
  "id": "849f8d4f09b89378",
  "type": "inject",
  "z": "a5a233b8293b3b76",
  "name": "",
  "props": [
    {
      "p": "payload"
    },
    {
      "p": "topic",
      "vt": "str"
    }
  ],
  "repeat": "1",
  "crontab": "",
  "once": false,
  "onceDelay": 0.1,
  "topic": "",
  "payload": "",
  "payloadType": "date",
  "x": 170,
  "y": 520,
  "wires": [
    [
      "254533e00c325882"
```



```
    ]
  ]
},
{
  "id": "254533e00c325882",
  "type": "modbus-getter",
  "z": "a5a233b8293b3b76",
  "name": "Temp real",
  "showStatusActivities": false,
  "showErrors": false,
  "showWarnings": true,
  "logIOActivities": false,
  "unitid": "",
  "dataType": "Coil",
  "adr": "100",
  "quantity": "2",
  "server": "2c1200c61acb0c9c",
  "useIOFile": false,
  "ioFile": "",
  "useIOForPayload": false,
  "emptyMsgOnFail": false,
  "keepMsgProperties": false,
  "delayOnStart": false,
  "startDelayTime": "",
  "x": 380,
  "y": 520,
  "wires": [
    [
```

```
        "349ed739816292a9",
        "5a672faaea55ecd3",
        "8e5f111af5648f3c"
    ],
    []
]
},
{
    "id": "349ed739816292a9",
    "type": "debug",
    "z": "a5a233b8293b3b76",
    "name": "debug 27",
    "active": false,
    "tosidebar": true,
    "console": false,
    "tostatus": false,
    "complete": "false",
    "statusVal": "",
    "statusType": "auto",
    "x": 780,
    "y": 520,
    "wires": []
},
{
    "id": "8c96c715f6ac7849",
    "type": "comment",
    "z": "a5a233b8293b3b76",
    "name": "Set. Temp Coefficient",
```

```
"info": "",
"x": 160,
"y": 600,
"wires": []
},
{
  "id": "3ef0a86d030b7d8b",
  "type": "ui_slider",
  "z": "a5a233b8293b3b76",
  "name": "",
  "label": "Cooling coefficient",
  "tooltip": "",
  "group": "afacf291d3fa6b66",
  "order": 4,
  "width": 0,
  "height": 0,
  "passthru": true,
  "outs": "end",
  "topic": "topic",
  "topicType": "msg",
  "min": 0,
  "max": "20",
  "step": 1,
  "className": "",
  "x": 170,
  "y": 640,
  "wires": [
    [
```

```
        "5afffbc1b24df165"
    ]
]
},
{
    "id": "5afffbc1b24df165",
    "type": "modbus-write",
    "z": "a5a233b8293b3b76",
    "name": "",
    "showStatusActivities": false,
    "showErrors": false,
    "showWarnings": true,
    "unitid": "",
    "dataType": "HoldingRegister",
    "adr": "102",
    "quantity": "1",
    "server": "2c1200c61acb0c9c",
    "emptyMsgOnFail": false,
    "keepMsgProperties": false,
    "delayOnStart": false,
    "startDelayTime": "",
    "x": 400,
    "y": 640,
    "wires": [
        [],
        []
    ]
},
```

```
{
  "id": "abbae65a6983e366",
  "type": "ui_slider",
  "z": "a5a233b8293b3b76",
  "name": "",
  "label": "Heating coefficient",
  "tooltip": "",
  "group": "afacf291d3fa6b66",
  "order": 5,
  "width": 0,
  "height": 0,
  "passthru": true,
  "outs": "end",
  "topic": "topic",
  "topicType": "msg",
  "min": 0,
  "max": "20",
  "step": 1,
  "className": "",
  "x": 170,
  "y": 700,
  "wires": [
    [
      "aacc204dedb47e3c"
    ]
  ]
},
{
```

```
"id": "aacc204dedb47e3c",
"type": "modbus-write",
"z": "a5a233b8293b3b76",
"name": "",
"showStatusActivities": false,
"showErrors": false,
"showWarnings": true,
"unitid": "",
"dataType": "HoldingRegister",
"adr": "100",
"quantity": "1",
"server": "2c1200c61acb0c9c",
"emptyMsgOnFail": false,
"keepMsgProperties": false,
"delayOnStart": false,
"startDelayTime": "",
"x": 400,
"y": 700,
"wires": [
    [],
    []
]
},
{
    "id": "f8bc1572c5a79944",
    "type": "ui_numeric",
    "z": "a5a233b8293b3b76",
    "name": "",
```

```
"label": "Warning Temp",
"tooltip": "",
"group": "afacf291d3fa6b66",
"order": 3,
"width": 0,
"height": 0,
"wrap": false,
"passthru": true,
"topic": "topic",
"topicType": "msg",
"format": "",
"min": 0,
"max": "100",
"step": "5",
"className": "",
"x": 160,
"y": 760,
"wires": [
  [
    "d758208ebb4dc276",
    "992f0487f04fb41d",
    "f20bcc130148c564"
  ]
]
},
{
  "id": "d758208ebb4dc276",
  "type": "modbus-write",
```

```
"z": "a5a233b8293b3b76",
"name": "",
"showStatusActivities": false,
"showErrors": false,
"showWarnings": true,
"unitid": "",
"dataType": "HoldingRegister",
"adr": "104",
"quantity": "1",
"server": "2c1200c61acb0c9c",
"emptyMsgOnFail": false,
"keepMsgProperties": false,
"delayOnStart": false,
"startDelayTime": "",
"x": 400,
"y": 760,
"wires": [
  [],
  []
]
},
{
  "id": "03733fa11b56cea9",
  "type": "ui_numeric",
  "z": "a5a233b8293b3b76",
  "name": "",
  "label": "Set point",
  "tooltip": "",
```



```
"group": "afacf291d3fa6b66",
"order": 1,
"width": 0,
"height": 0,
"wrap": false,
"passthru": true,
"topic": "Set-point",
"topicType": "str",
"format": "",
"min": 0,
"max": "100",
"step": "1",
"className": "",
"x": 160,
"y": 1040,
"wires": [
  [
    "8be314d5ec67b87b",
    "fcff4bb1b79b80df"
  ]
]
},
{
  "id": "8be314d5ec67b87b",
  "type": "modbus-write",
  "z": "a5a233b8293b3b76",
  "name": "",
  "showStatusActivities": false,
```

```
"showErrors": false,
"showWarnings": true,
"unitid": "",
"dataType": "HoldingRegister",
"adr": "110",
"quantity": "1",
"server": "2c1200c61acb0c9c",
"emptyMsgOnFail": false,
"keepMsgProperties": false,
"delayOnStart": false,
"startDelayTime": "",
"x": 420,
"y": 1040,
"wires": [
  [],
  []
]
},
{
  "id": "c22fad3b918828ef",
  "type": "ui_numeric",
  "z": "a5a233b8293b3b76",
  "name": "",
  "label": "Hyster Value",
  "tooltip": "",
  "group": "afacf291d3fa6b66",
  "order": 2,
  "width": 0,
```

```
"height": 0,
"wrap": false,
"passthru": true,
"topic": "topic",
"topicType": "msg",
"format": "",
"min": 0,
"max": "100",
"step": "5",
"className": "",
"x": 170,
"y": 980,
"wires": [
  [
    "b68f70b878db6351"
  ]
]
},
{
  "id": "b68f70b878db6351",
  "type": "modbus-write",
  "z": "a5a233b8293b3b76",
  "name": "",
  "showStatusActivities": false,
  "showErrors": false,
  "showWarnings": true,
  "unitid": "",
  "dataType": "HoldingRegister",
```

```
"adr": "112",
"quantity": "1",
"server": "2c1200c61acb0c9c",
"emptyMsgOnFail": false,
"keepMsgProperties": false,
"delayOnStart": false,
"startDelayTime": "",
"x": 420,
"y": 980,
"wires": [
  [],
  []
]
},
{
  "id": "64cda66473ec13d0",
  "type": "ui_gauge",
  "z": "a5a233b8293b3b76",
  "name": "",
  "group": "6e3df5cb7e3613ed",
  "order": 3,
  "width": 0,
  "height": 0,
  "gtype": "gage",
  "title": "Current Temp",
  "label": "units",
  "format": "",
  "min": 0,
```

```
"max": "100",  
"colors": [  
  "#00b500",  
  "#e6e600",  
  "#ca3838"  
],  
"seg1": "",  
"seg2": "",  
"diff": false,  
"className": "",  
"x": 820,  
"y": 260,  
"wires": []  
},  
{  
  "id": "e83354a0a899b1b5",  
  "type": "ui_chart",  
  "z": "a5a233b8293b3b76",  
  "name": "",  
  "group": "6e3df5cb7e3613ed",  
  "order": 4,  
  "width": 0,  
  "height": 0,  
  "label": "Temp. History",  
  "chartType": "line",  
  "legend": "false",  
  "xformat": "HH:mm:ss",  
  "interpolate": "linear",
```

```
"nodata": "",
"dot": false,
"ymin": "0",
"ymax": "100",
"removeOlder": 1,
"removeOlderPoints": "",
"removeOlderUnit": "60",
"cutout": 0,
"useOneColor": false,
"useUTC": false,
"colors": [
  "#1f77b4",
  "#aec7e8",
  "#ff7f0e",
  "#2ca02c",
  "#98df8a",
  "#d62728",
  "#ff9896",
  "#9467bd",
  "#c5b0d5"
],
"outputs": 1,
"useDifferentColor": false,
"className": "",
"x": 820,
"y": 220,
"wires": [
  []
]
```

```
]
},
{
  "id": "3b1a582f76d116e5",
  "type": "ui_led",
  "z": "a5a233b8293b3b76",
  "order": 1,
  "group": "6e3df5cb7e3613ed",
  "width": 0,
  "height": 0,
  "label": "Heating",
  "labelPlacement": "left",
  "labelAlignment": "left",
  "colorForValue": [
    {
      "color": "#808080",
      "value": "false",
      "valueType": "bool"
    },
    {
      "color": "#00ff00",
      "value": "true",
      "valueType": "bool"
    }
  ],
  "allowColorForValueInMessage": false,
  "shape": "circle",
  "showGlow": true,
```

```
"name": "",
"x": 790,
"y": 480,
"wires": []
},
{
  "id": "5a672faaea55ecd3",
  "type": "function",
  "z": "a5a233b8293b3b76",
  "name": "Heating",
  "func": "msg.payload = msg.payload[0];\nreturn msg;",
  "outputs": 1,
  "timeout": 0,
  "noerr": 0,
  "initialize": "",
  "finalize": "",
  "libs": [],
  "x": 580,
  "y": 480,
  "wires": [
    [
      "3b1a582f76d116e5"
    ]
  ]
},
{
  "id": "aaa56f7d130a79e5",
  "type": "ui_led",
```



```
"z": "a5a233b8293b3b76",
"order": 2,
"group": "6e3df5cb7e3613ed",
"width": 0,
"height": 0,
"label": "High Temp.",
"labelPlacement": "left",
"labelAlignment": "left",
"colorForValue": [
  {
    "color": "#808080",
    "value": "false",
    "valueType": "bool"
  },
  {
    "color": "#ff0000",
    "value": "true",
    "valueType": "bool"
  }
],
"allowColorForValueInMessage": false,
"shape": "circle",
"showGlow": true,
"name": "",
"x": 790,
"y": 440,
"wires": []
},
```

```
{
  "id": "8e5f111af5648f3c",
  "type": "function",
  "z": "a5a233b8293b3b76",
  "name": "High Temp",
  "func": "msg.payload = msg.payload[1];\nreturn msg;",
  "outputs": 1,
  "timeout": 0,
  "noerr": 0,
  "initialize": "",
  "finalize": "",
  "libs": [],
  "x": 590,
  "y": 440,
  "wires": [
    [
      "aaa56f7d130a79e5"
    ]
  ]
},
{
  "id": "963f4eed5f967430",
  "type": "mqtt out",
  "z": "a5a233b8293b3b76",
  "name": "",
  "topic": "temp",
  "qos": "",
  "retain": "",
```

```

    "respTopic": "",
    "contentType": "",
    "userProps": "",
    "correl": "",
    "expiry": "",
    "broker": "02333a748d16e4f5",
    "x": 790,
    "y": 160,
    "wires": []
  },
  {
    "id": "11092e60cd5ad91c",
    "type": "function",
    "z": "a5a233b8293b3b76",
    "name": "function 18",
    "func": "var setpoint = flow.get('setpoint')|0.0;\nmsg.payload = {\n  \"temperature\":\nmsg.payload,\n  \"setpoint\" : setpoint\n}\nreturn msg;",
    "outputs": 1,
    "timeout": 0,
    "noerr": 0,
    "initialize": "",
    "finalize": "",
    "libs": [],
    "x": 610,
    "y": 160,
    "wires": [
      [
        "963f4eed5f967430",

```

```
        "c0b99d4c343b9e34",
        "713c0957c9f3daf2"
    ]
]
},
{
    "id": "c0b99d4c343b9e34",
    "type": "debug",
    "z": "a5a233b8293b3b76",
    "name": "debug 29",
    "active": false,
    "tosidebar": true,
    "console": false,
    "tostatus": false,
    "complete": "true",
    "targetType": "full",
    "statusVal": "",
    "statusType": "auto",
    "x": 800,
    "y": 120,
    "wires": []
},
{
    "id": "fcff4bb1b79b80df",
    "type": "function",
    "z": "a5a233b8293b3b76",
    "name": "set flow variable",
    "func": "flow.set('setpoint',msg.payload);\nreturn msg;"
```

```
"outputs": 1,
"timeout": 0,
"noerr": 0,
"initialize": "",
"finalize": "",
"libs": [],
"x": 420,
"y": 1100,
"wires": [
  []
],
{
  "id": "992f0487f04fb41d",
  "type": "mqtt out",
  "z": "a5a233b8293b3b76",
  "name": "",
  "topic": "warningtemp",
  "qos": "",
  "retain": "true",
  "respTopic": "",
  "contentType": "",
  "userProps": "",
  "correl": "",
  "expiry": "",
  "broker": "02333a748d16e4f5",
  "x": 390,
  "y": 820,
```

```
    "wires": []
  },
  {
    "id": "713c0957c9f3daf2",
    "type": "mqtt out",
    "z": "a5a233b8293b3b76",
    "name": "",
    "topic": "process",
    "qos": "",
    "retain": "",
    "respTopic": "",
    "contentType": "",
    "userProps": "",
    "correl": "",
    "expiry": "",
    "broker": "f7c389293e4c76c2",
    "x": 800,
    "y": 60,
    "wires": []
  },
  {
    "id": "f20bcc130148c564",
    "type": "mqtt out",
    "z": "a5a233b8293b3b76",
    "name": "",
    "topic": "warningtemp",
    "qos": "",
    "retain": "",
```

```
"respTopic": "",
"contentType": "",
"userProps": "",
"correl": "",
"expiry": "",
"broker": "f7c389293e4c76c2",
"x": 390,
"y": 880,
"wires": []
},
{
  "id": "db5373d032033066",
  "type": "aedes broker",
  "z": "a5a233b8293b3b76",
  "name": "",
  "mqtt_port": 1883,
  "mqtt_ws_bind": "port",
  "mqtt_ws_port": "",
  "mqtt_ws_path": "",
  "cert": "",
  "key": "",
  "certname": "",
  "keyname": "",
  "persistence_bind": "memory",
  "dburl": "",
  "usetls": false,
  "x": 170,
  "y": 60,
```

```
"wires": [  
  [],  
  []  
]  
,  
{  
  "id": "2c1200c61acb0c9c",  
  "type": "modbus-client",  
  "name": "Delta_simulator",  
  "clienttype": "tcp",  
  "bufferCommands": true,  
  "stateLogEnabled": true,  
  "queueLogEnabled": false,  
  "failureLogEnabled": true,  
  "tcpHost": "127.0.0.1",  
  "tcpPort": "10002",  
  "tcpType": "DEFAULT",  
  "serialPort": "/dev/ttyUSB",  
  "serialType": "RTU-BUFFERD",  
  "serialBaudrate": "9600",  
  "serialDatabits": "8",  
  "serialStopbits": "1",  
  "serialParity": "none",  
  "serialConnectionDelay": "100",  
  "serialAsciiResponseStartDelimiter": "0x3A",  
  "unit_id": 1,  
  "commandDelay": 1,  
  "clientTimeout": 1000,
```



```
"reconnectOnTimeout": true,
"reconnectTimeout": 2000,
"parallelUnitIdsAllowed": true,
"showWarnings": true,
"showLogs": true
},
{
  "id": "afacf291d3fa6b66",
  "type": "ui_group",
  "name": "Inputs",
  "tab": "374de5f9a509ca69",
  "order": 1,
  "disp": true,
  "width": "6",
  "collapse": false,
  "className": ""
},
{
  "id": "6e3df5cb7e3613ed",
  "type": "ui_group",
  "name": "Outputs",
  "tab": "374de5f9a509ca69",
  "order": 2,
  "disp": true,
  "width": "6",
  "collapse": false,
  "className": ""
},
}
```

```
{
  "id": "02333a748d16e4f5",
  "type": "mqtt-broker",
  "name": "",
  "broker": "localhost",
  "port": "1883",
  "clientid": "",
  "autoConnect": true,
  "usetls": false,
  "protocolVersion": "4",
  "keepalive": "60",
  "cleansession": true,
  "autoUnsubscribe": true,
  "birthTopic": "",
  "birthQos": "0",
  "birthRetain": "false",
  "birthPayload": "",
  "birthMsg": {},
  "closeTopic": "",
  "closeQos": "0",
  "closeRetain": "false",
  "closePayload": "",
  "closeMsg": {},
  "willTopic": "",
  "willQos": "0",
  "willRetain": "false",
  "willPayload": "",
  "willMsg": {},
```

```
"userProps": "",
"sessionExpiry": ""
},
{
  "id": "f7c389293e4c76c2",
  "type": "mqtt-broker",
  "name": "",
  "broker": "2a683b5cf98a4c8a90dbc4190e75cd28.s1.eu.hivemq.cloud",
  "port": "8883",
  "tls": "",
  "clientid": "",
  "autoConnect": true,
  "usetls": true,
  "protocolVersion": "4",
  "keepalive": "60",
  "cleansession": true,
  "autoUnsubscribe": true,
  "birthTopic": "",
  "birthQos": "0",
  "birthRetain": "false",
  "birthPayload": "",
  "birthMsg": {},
  "closeTopic": "",
  "closeQos": "0",
  "closeRetain": "false",
  "closePayload": "",
  "closeMsg": {},
  "willTopic": "",
```

```
"willQos": "0",
"willRetain": "false",
"willPayload": "",
"willMsg": {},
"userProps": "",
"sessionExpiry": ""
},
{
  "id": "374de5f9a509ca69",
  "type": "ui_tab",
  "name": "Temperature Control",
  "icon": "dashboard",
  "order": 2,
  "disabled": false,
  "hidden": false
}
]
```