

Node-RED: Case Study 2

Temperature & Humidity Monitoring System using ESP32 & DHT11



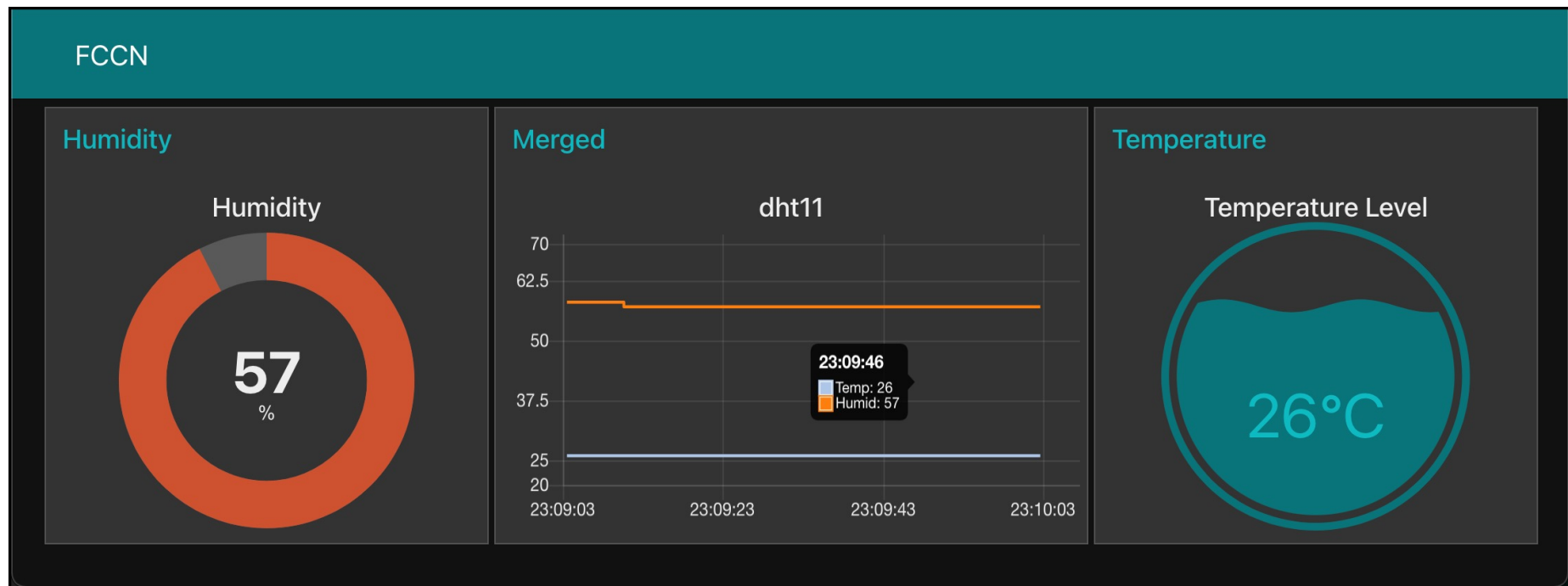
v1 mar2021

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Scenario: To set up temperature & humidity monitoring system dashboard with the following conditions:

- a chart for temperature,
- a chart for humidity,
- a 2 line chart showing temperature & humidity value.



Requirement:

- i. ESP32 x 1,
- ii. DHT11 x1,
- iii. NodeRED – PC or Pi.

Methods:

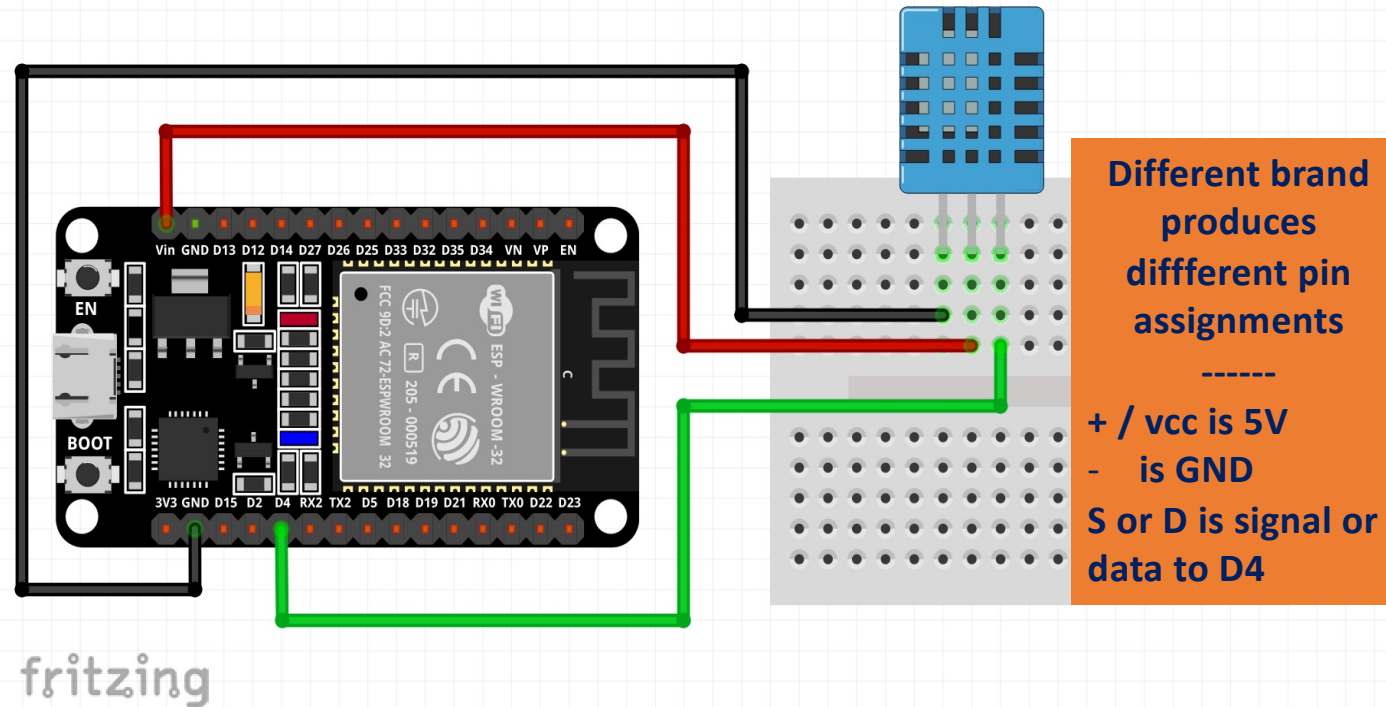
- i. Do wiring connection & upload the sketch into microcontroller.
Troubleshoot any errors.
- ii. NodeRED configuration: Layout, Nodes & nodes properties
- iii. Test the system

Microcontroller: a. The Schematic Diagram.

>Connect your board to PC / laptop.

>Make sure correct board name & port is selected.

>Always check your wiring especially the power supply. This might save your money from replacing a burnt device.



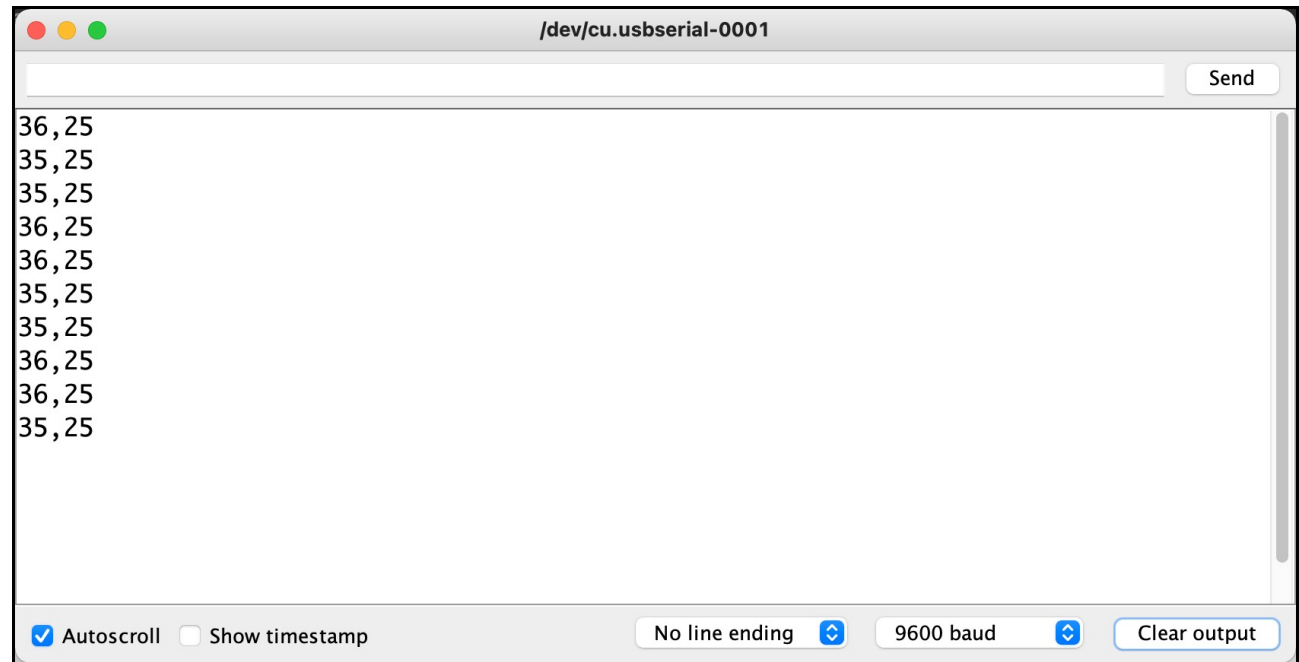
Microcontroller: b. The sketch.

```
1  #include <dht11.h>
2  dht11 DHT;
3  #define DHT11_PIN 4
4
5  void setup(){
6    Serial.begin(9600);
7  }
8
9  void loop(){
10   int chk;
11   chk = DHT.read(DHT11_PIN);  // READ DATA
12
13   // DISPLAY DATA
14   Serial.print(DHT.humidity,1);
15   Serial.print(",");
16   Serial.println(DHT.temperature,1);
17
18   delay(1000);
19 }
```

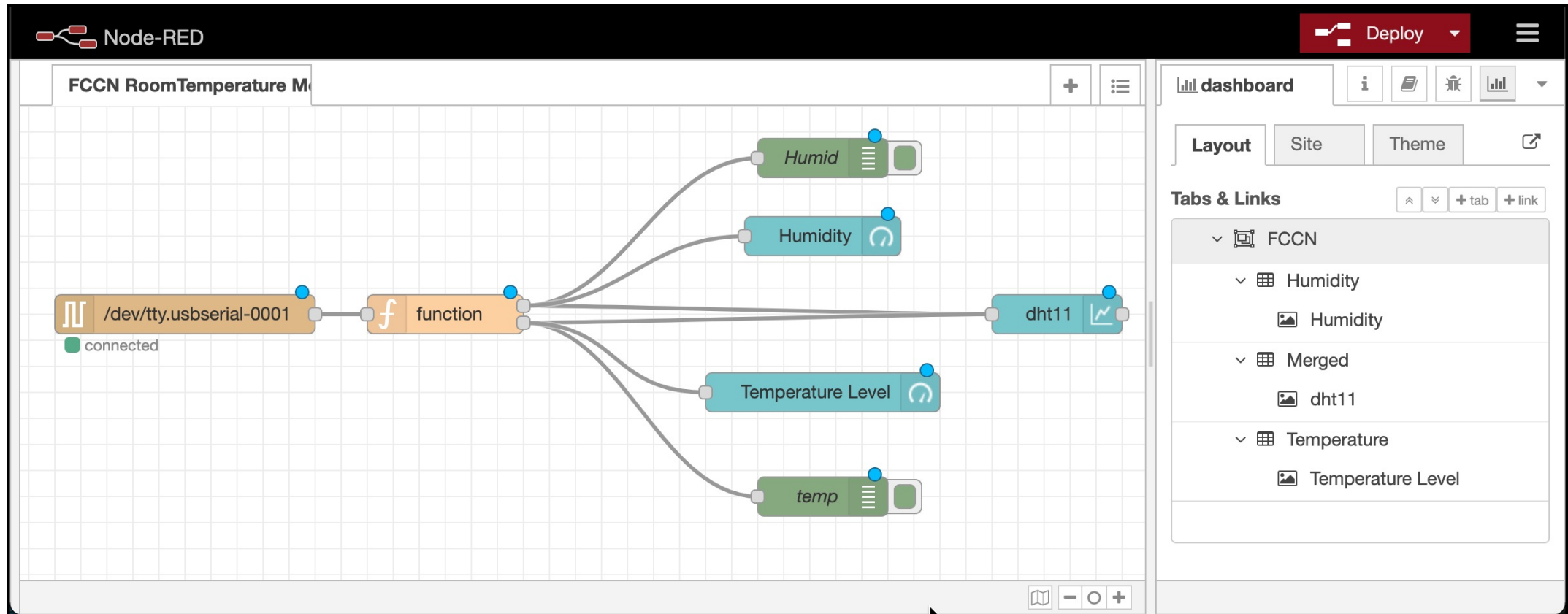
Microcontroller: c. Expected Output.

> Upload the sketch, open Serial Monitor & adjust the baud rate option.

> Close the Serial Monitor to give a way for NodeRED Serial In node to communicate with ESP32.



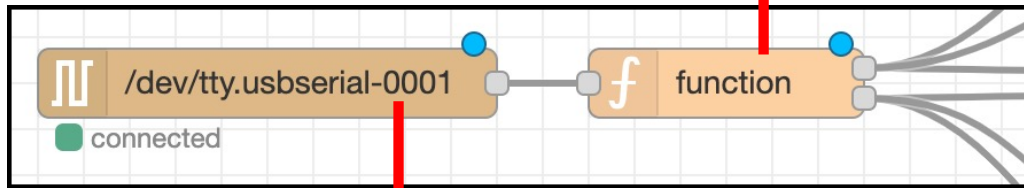
Node-RED: d. Layout.



[d2-cs2-31mar21-flows-e32-dht11-compressed.json](#)

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Node-RED: d. Layout.



Edit serial in node

Delete Cancel Done

⚙ Properties

Serial Port

Name

Edit function node

Delete Cancel Done

⚙ Properties

Name

Setup Function Close

```
1 var output = msg.payload.split(",");
2 msg={};
3 msg2={};
4
5 var read1 = parseInt(output[0]);
6 var read2 = parseInt(output[1]);
7
8 msg = {payload : read1};
9 msg.topic = 'Humid';
10
11 msg1 = {payload : read2};
12 msg1.topic = 'Temp';
13
14 return [msg,msg1];
```

Outputs 2

```
//COPY ME
var output = msg.payload.split(",");
msg={};
msg2={};

var read1 = parseInt(output[0]);
var read2 = parseInt(output[1]);

msg = {payload : read1;
msg.topic = 'Humid';

msg1 = {payload : read2;
msg1.topic = 'Temp';

return [msg,msg1];
```


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Node-RED: d. Layout.

The image displays the Node-RED interface for configuring a Temperature Level gauge node and its associated debug node. The central workspace shows a 'Temperature Level' gauge node (light blue) and a 'temp' node (green) connected by a wire. Red arrows point from these nodes to their respective configuration panels.

Edit gauge node

Properties:

- Group: [FCCN] Temperature
- Size: auto
- Type: Level
- Label: Temperature Level
- Units: °C
- Range: min 15, max 35
- Name:

☐ Enabled

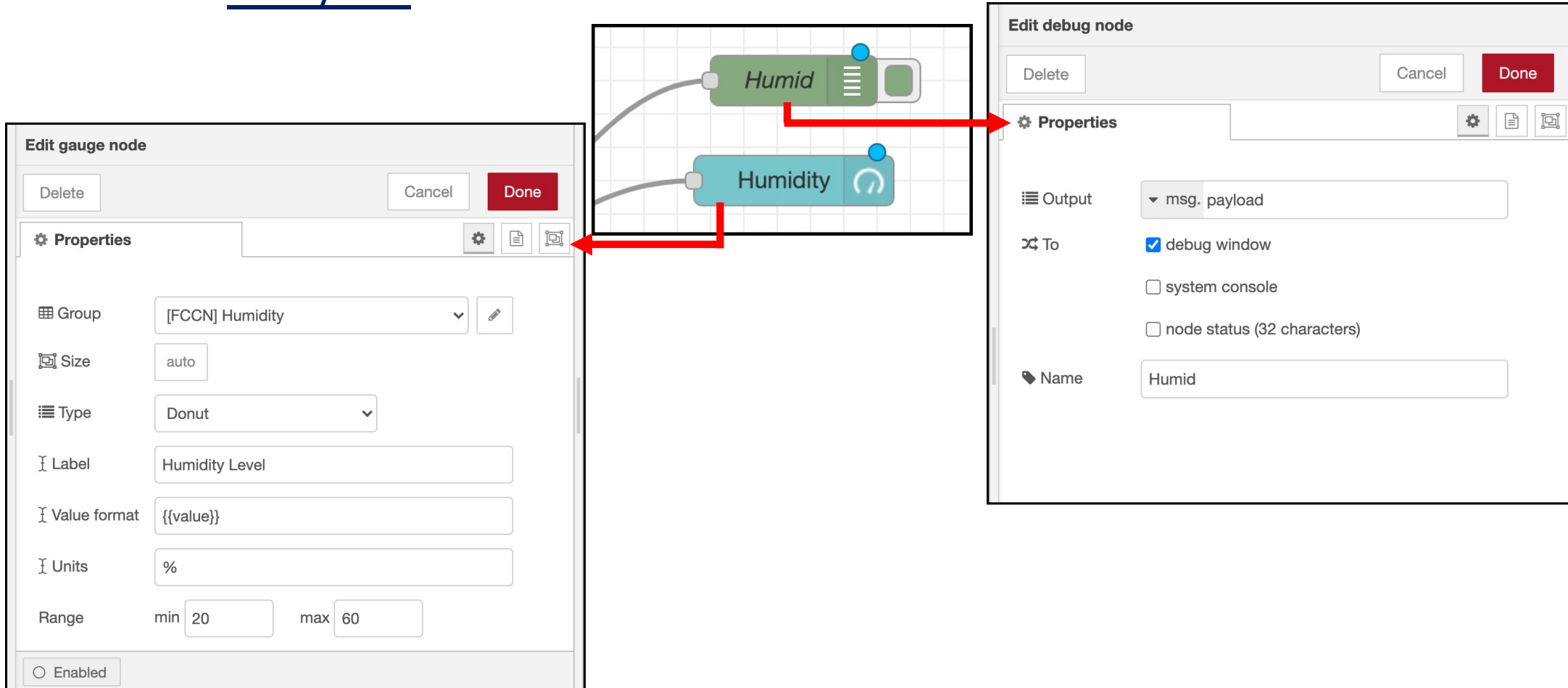
Edit debug node

Properties:

- Output: msg. payload
- To: ☒ debug window, ☐ system console, ☐ node status (32 characters)
- Name: Humid

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Node-RED: d. Layout.



The image displays the Node-RED interface for configuring a Temperature & Humidity Monitoring System. The central workspace shows two nodes: a green 'Humid' node and a teal 'Humidity' node. Red arrows indicate the configuration panels for each node.

Edit gauge node (Humidity):

- Group: [FCCN] Humidity
- Size: auto
- Type: Donut
- Label: Humidity Level
- Value format: {{value}}
- Units: %
- Range: min 20, max 60
- Enabled: ☐

Edit debug node (Humid):

- Output: msg. payload
- To: ☒ debug window, ☐ system console, ☐ node status (32 characters)
- Name: Humid

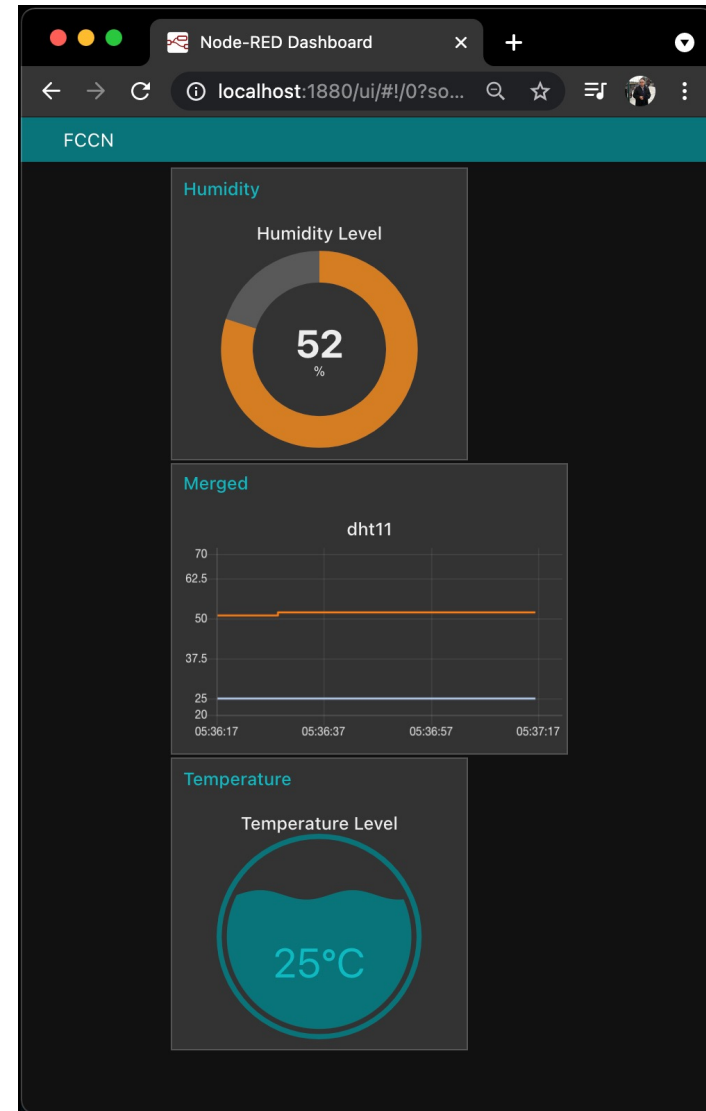
Node-RED: d. Layout.



The debug console displays a list of messages from the 'all nodes' tab. The messages are organized by node type: Humid and Temp. Each message includes a timestamp, the node name, and the payload value.

Timestamp	Node	Payload
31/03/2021, 05:34:49	temp	24
31/03/2021, 05:34:50	Humid	51
31/03/2021, 05:34:50	temp	24
31/03/2021, 05:34:51	Humid	51
31/03/2021, 05:34:51	temp	24

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QUESTIONS?



Questions?

TQ & BYE

END