

The IBM logo is displayed in white text on a blue arrow-shaped background. The arrow points to the right and is positioned to the left of the main title.

IBM

# SPRINT 2 REPORT

SMARTFARMER – IOT ENABLED  
SMART FARMING APPLICATION

**TEAM ID – PNT2022TMID34458**

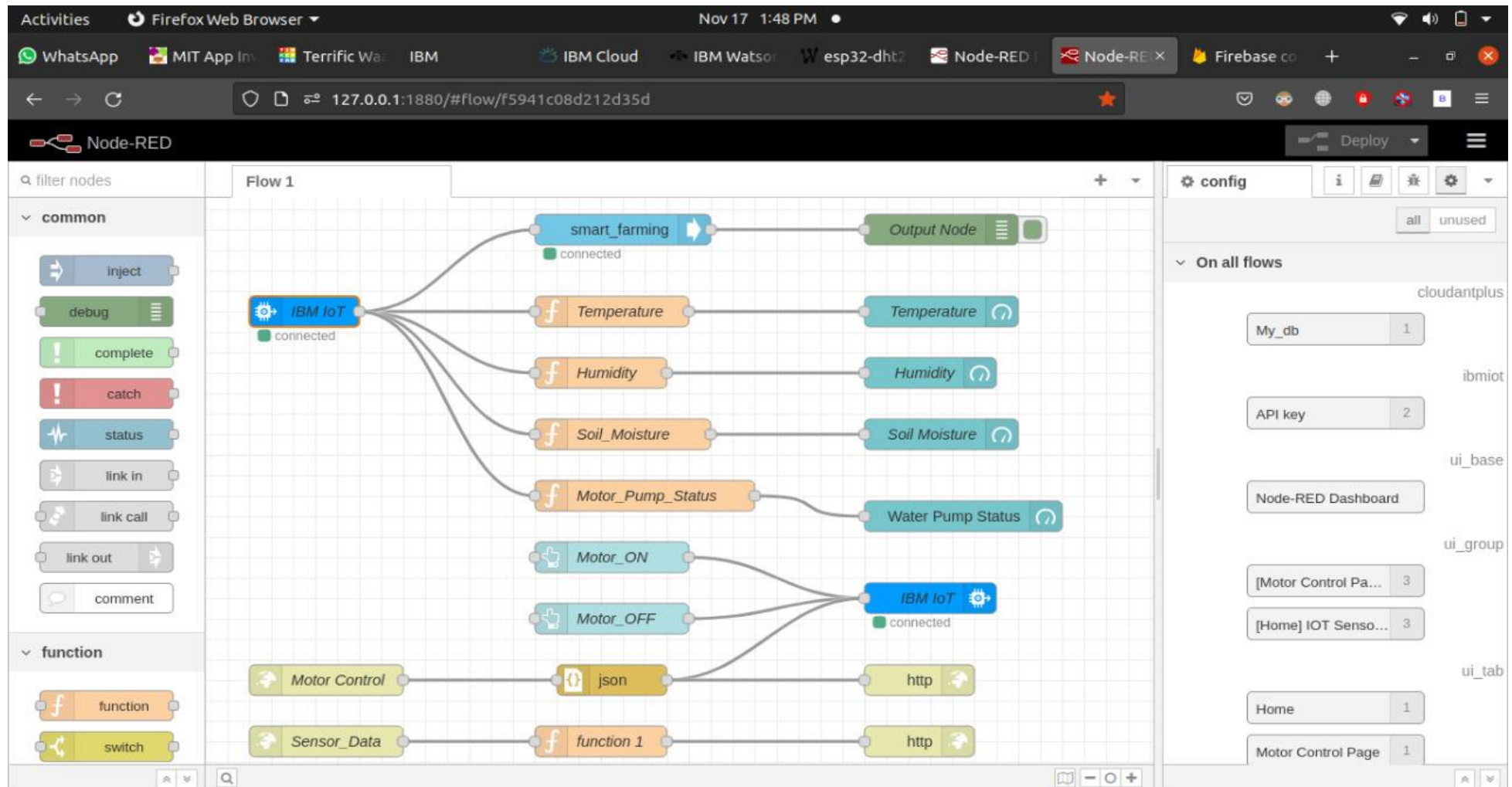
- **TEAM LEADER : MUGESHWARAN G**
- **TEAM MEMBER : ISRAVEL KEWIN CLINT P**
- **TEAM MEMBER : BLESSWIN.K.SAMUEL**
- **TEAM MEMBER : VIJAY S**

## Project Tracker

<b>Sprint</b>	<b>Total Story Points</b>	<b>Duration</b>	<b>Sprint Start Date</b>	<b>Sprint End Date (Planned)</b>	<b>Story Points Completed (as on Planned End Date)</b>	<b>Sprint Release Date (Actual)</b>
Sprint-1	15	5 Days	26 Oct 2022	30 Oct 2022		30 Oct 2022
Sprint-2	15	7 Days	31 Oct 2022	06 Nov 2022	15	07 Nov 2022
Sprint-3	15	6 Days	07 Nov 2022	12 Nov 2022		13 Nov 2022
Sprint-4	15	6 Days	13 Nov 2022	18 Nov 2022		18 Nov 2022 – 19 Nov 2022

S.NO	Tool
1	Node Red

# Application Node Red Structure



# IBM Input Node

The screenshot displays the Node-RED web interface in a Firefox browser window. The address bar shows the URL `127.0.0.1:1880/#Flow/f5941c08d212d35d`. The main workspace shows a flow named "Flow 1" with an "IBM IoT" node (status: connected) connected to several function nodes. The left sidebar contains a "filter nodes" search bar and two categories: "common" (inject, debug, complete, catch, status, link in, link call, link out, comment) and "function" (function, switch). The right sidebar is divided into two panels. The top panel, titled "Edit ibmiot in node", contains a "Delete" button, "Cancel" and "Done" buttons, and a "Properties" section with the following settings:

- Authentication: API Key
- API Key: API key
- Input Type: Device Event
- Device Type: ☐ All or IOT\_Device
- Device Id: ☐ All or Smart\_Farming
- Event: ☒ All or +
- Format: ☐ All or json
- QoS: 0
- Name: IBM IoT
- Service: registered
- ☐ Enabled

The bottom panel, titled "config", shows a list of nodes on all flows. The nodes are organized into tabs: "cloudantplus", "ibmiot", "ui\_base", "ui\_group", and "ui\_tab". The "ibmiot" tab is active, showing a list of nodes with their names and counts:

Node Name	Count
My_db	1
API key	2
Node-RED Dashboard	
[Motor Control Pa...	3
[Home] IOT Senso...	3
Home	1
Motor Control Page	1

# Cloudant out Node

Activities Firefox Web Browser Nov 17 1:53 PM

WhatsApp MIT App In Terrific Wa IBM IBM Cloud IBM Watson W esp32-dht2 Node-RED Node-RE x Firebase co

127.0.0.1:1880/#flow/f5941c08d212d35d

Node-RED

Flow 1

smart\_farming

connected

Temperature

Humidity

Soil\_Moisture

Motor\_Pump\_Status

Motor\_ON

Motor\_OFF

json

function 1

inject

debug

complete

catch

status

link in

link call

link out

comment

function

switch

filter nodes

common

function

Properties

Service External cloudant or couchdb service

Server My\_db

Database smart\_farming

Operation insert / update

Only store msg.payload object?

Name Name

Enabled

config

all unused

On all flows

cloudantplus

My\_db 1

API key 2

Node-RED Dashboard

ibmiot

ui\_base

ui\_group

[Motor Control Pa... 3

[Home] IOT Senso... 3

ui\_tab

Home 1

Motor Control Page 1

# Temperature Function

The screenshot displays the Node-RED web interface in a Firefox browser window. The address bar shows the URL `127.0.0.1:1880/#flow/f5941c08d212d35d`. The interface is divided into several panels:

- Left Panel (Node Palette):** Contains a search bar and two categories of nodes: 'common' (inject, debug, complete, catch, status, link in, link call, link out, comment) and 'function' (function, switch).
- Flow Canvas:** Shows a flow named 'Flow 1' with the following nodes: 'smart\_farming' (connected), 'Temperature', 'Humidity', 'Soil\_Moisture', 'Motor\_Pump\_Status', 'Motor\_ON', 'Motor\_OFF', 'json', and 'function 1'.
- Edit Function Node Panel:** Open for the 'Temperature' node. It includes a 'Delete' button, 'Cancel', and 'Done' buttons. The 'Properties' section shows the name 'Temperature'. The 'On Message' tab is selected, displaying the following JavaScript code:

```
1 msg.payload = msg.payload.Temperature
2 global.set("t", msg.payload);
3 return msg;
```
- Right Panel (Configuration):** Shows a 'config' panel with tabs for 'all' and 'unused'. It lists various settings under 'On all flows', including 'cloudantplus', 'My\_db', 'API key', 'Node-RED Dashboard', '[Motor Control Pa...', '[Home] IOT Senso...', 'Home', and 'Motor Control Page'.

# Humidity Function

The screenshot shows the Node-RED web interface in a Firefox browser window. The address bar indicates the URL `127.0.0.1:1880/#flow/f5941c08d212d35d`. The interface is divided into several panels:

- Left Panel (Nodes):** Contains a search bar and two categories of nodes: **common** (inject, debug, complete, catch, status, link in, link call, link out, comment) and **function** (function, switch).
- Flow 1:** A sequence of nodes connected in a flow: `smart_farming` (connected) → `Temperature` → `Humidity` → `Soil_Moisture` → `Motor_Pump_Status` → `Motor_ON` → `Motor_OFF` → `json` → `function 1`.
- Edit function node:** The `Humidity` node is selected, and its configuration is shown. The **Properties** tab is active, with the **Name** set to `Humidity. The On Message tab is selected, showing the following JavaScript code:

```
1 msg.payload = msg.payload.Humidity
2 global.set("h", msg.payload);
3 return msg;
````
- Right Panel (Config):** The **config** tab is active, showing a list of nodes and their configurations. The **On all flows** section is expanded, showing the following configurations:
  - cloudantplus:** `My_db` (1)
  - ibmiot:** `API key` (2)
  - ui\_base:** `Node-RED Dashboard`
  - ui\_group:** `[Motor Control Pa...` (3), `[Home] IOT Senso...` (3)
  - ui\_tab:** `Home` (1), `Motor Control Page` (1)



# Soil Moisture Function

The screenshot shows the Node-RED web interface in a Firefox browser. The address bar indicates the URL `127.0.0.1:1880/#flow/f5941c08d212d35d`. The interface is divided into several panels:

- Left Panel (Palette):** Contains a search bar and two categories of nodes:
  - common:** inject, debug, complete, catch, status, link in, link call, link out, comment.
  - function:** function, switch.
- Flow Canvas:** Displays a flow named "Flow 1". It starts with a "smart\_farming" node (labeled "connected"), followed by a sequence of function nodes: "Temperature", "Humidity", "Soil\_Moisture", "Motor\_Pump\_Status", "Motor\_ON", and "Motor\_OFF". The flow ends with a "json" node and a "function 1" node.
- Right Panel (Edit function node):** The "Soil\_Moisture" function node is selected. The "Name" field is set to "Soil\_Moisture". The "On Message" tab is active, showing the following JavaScript code:

```
1 msg.payload = msg.payload.Soil_Moisture
2 global.set("s", msg.payload);
3 return msg;
```
- Far Right Panel (config):** Shows a configuration table with various settings. The "On all flows" section lists several configurations with their respective values:

Category	Configuration	Value
cloudantplus	My_db	1
	API key	2
ibmiot	Node-RED Dashboard	
	Motor Control Pa...	3
ui_base	[Home] IOT Senso...	3
	Home	1
ui_group	Motor Control Page	1
	Motor Control Page	1

# Motor-Pump Function

The screenshot displays the Node-RED web interface in a Firefox browser window. The address bar shows the URL `127.0.0.1:1880/#flow/f5941c08d212d35d`. The interface is divided into several panels:

- Left Panel (filter nodes):** Contains a search bar and two categories of nodes: **common** (inject, debug, complete, catch, status, link in, link call, link out, comment) and **function** (function, switch).
- Flow 1:** A central workspace showing a flow of nodes. The flow starts with a `smart_farming` node, followed by a `Temperature` node, then a `Humidity` node, then a `Soil_Moisture` node, then a `Motor_Pump_Status` node, then a `Motor_ON` node, then a `Motor_OFF` node, then a `json` node, and finally a `function 1` node.
- Edit function node:** A panel for editing the selected `Motor_Pump_Status` node. It includes a **Properties** section with a **Name** field set to `Motor_Pump_Status`. Below this are tabs for **Setup**, **On Start**, **On Message** (selected), and **On Stop**. The **On Message** tab contains the following JavaScript code:

```
1 msg.payload = msg.payload.Motor_Pump_Status
2 global.set("M", msg.payload);
3 return msg;
```
- Right Panel (config):** A panel for configuring the flow. It includes a **config** section with a **My\_db** field set to `1`, an **API key** field set to `2`, and a **Node-RED Dashboard** field. Below this are sections for **ui\_base**, **ui\_group**, and **ui\_tab**, each containing a **Home** field set to `1`.

# Temperature Gauge Node

The screenshot displays the Node-RED web interface in a Firefox browser window. The address bar shows the URL `127.0.0.1:1880/#flow/f5941c08d212d35d`. The interface is divided into three main sections:

- Left Panel (Nodes):** A sidebar with a search bar and two categories: **common** and **function**. The **common** category includes nodes like `inject`, `debug`, `complete`, `catch`, `status`, `link in`, `link call`, `link out`, and `comment`. The **function** category includes `function` and `switch`. The **Flow 1** workspace shows a sequence of nodes: `Output Node`, `Temperature` (highlighted), `Humidity`, `Soil Moisture`, `Water Pump Status`, and `IBM IoT` (with a green 'connected' indicator).
- Right Panel (Edit gauge node):** A configuration panel for the selected `Temperature` node. It includes a **Properties** section with the following settings:
  - Group:** `[Home] IOT Sensor Monitor`
  - Size:** `8 x 5`
  - Type:** `Gauge`
  - Label:** `Temperature`
  - Value format:** `{{value}}`
  - Units:** `degree celsius`
  - Range:** `min 0` and `max 100`
  - Colour gradient:** A visual representation of a gradient from blue to green to red.
  - Sectors:** A visual representation of a gauge with sectors at `0`, `30`, `60`, and `100`.
  - Class:** `Optional CSS class name(s) for widget`
  - Enabled:** A checkbox that is currently checked.
- Far Right Panel (config):** A configuration panel for the `config` node, showing a list of nodes and their counts. The list includes:
  - `My_db` (1)
  - `API key` (2)
  - `Node-RED Dashboard`
  - `[Motor Control Pa...` (3)
  - `[Home] IOT Senso...` (3)
  - `Home` (1)
  - `Motor Control Page` (1)

# Humidity Gauge Node

The screenshot displays the Node-RED web interface in a browser window. The address bar shows the URL `127.0.0.1:1880/#flow/f5941c08d212d35d`. The interface is divided into several panels:

- Left Panel (Palette):** Contains node categories like 'common' and 'function'. The 'common' category is expanded, showing nodes like 'Inject', 'debug', 'complete', 'catch', 'status', 'link in', 'link call', 'link out', 'comment', 'IBM IoT', 'Temperature', 'Humidity', 'Soil Moisture', 'Water Pump Status', 'http', and 'switch'.
- Flow Canvas:** Shows a flow named 'Flow 1' with nodes connected. The 'Humidity' node is highlighted with an orange border.
- Right Panel (Edit gauge node):** Displays the configuration for the selected 'Humidity' node. It includes a 'Delete' button, 'Cancel', and 'Done' buttons. The 'Properties' section contains the following fields:
  - Group:** '[Home] IOT Sensor Monitor' (dropdown)
  - Size:** '6 x 5' (text input)
  - Type:** 'Level' (dropdown)
  - Label:** 'Humidity' (text input)
  - Value format:** '{{value}}' (text input)
  - Units:** '%' (text input)
  - Range:** min '0' max '100' (text inputs)
  - Class:** 'Optional CSS class name(s) for widget' (text input)
  - Name:** 'Humidity' (text input)
- Far Right Panel (config):** Shows a configuration table with various settings. The 'On all flows' section is expanded, showing a list of configurations with columns for name, value, and group.

The status bar at the bottom left indicates the URL `27.0.0.1:1880/#editor-tab-properties`.

# Soil-Moisture Gauge Node

The screenshot displays the Node-RED web interface in a Firefox browser window. The address bar shows the URL `127.0.0.1:1880/#flow/f5941c08d212d35d`. The interface is divided into several panels:

- Left Panel (Nodes):** Contains a search bar and two categories of nodes:
  - common:** Includes nodes like `inject`, `debug`, `complete`, `catch`, `status`, `link in`, `link call`, `link out`, and `comment`.
  - function:** Includes `function` and `switch` nodes.
- Flow Canvas:** Shows a flow named "Flow 1" with several nodes connected. The `Soil Moisture` node is highlighted with an orange border.
- Right Panel (Edit gauge node):** Displays the configuration for the selected `Soil Moisture` node. It includes a `Delete` button, `Cancel`, and `Done` buttons. The **Properties** section contains the following settings:
  - Group:** `[Home] IOT Sensor Monitor`
  - Size:** `6 x 5`
  - Type:** `Donut`
  - Label:** `Soil Moisture`
  - Value format:** `{{value}}`
  - Units:** `%`
  - Range:** `min 0` and `max 100`
  - Colour gradient:** A visual representation of a gradient from red to green to blue.
  - Sectors:** A visual representation of a donut chart with sectors at 0, 30, 60, and 100.
  - Class:** `Optional CSS class name(s) for widget`
  - Enabled:** A radio button that is currently selected.
- Far Right Panel (config):** Shows a configuration table with various settings. The **On all flows** section includes:
  - `My_db` (1)
  - `API key` (2)
  - `Node-RED Dashboard`
  - `[Motor Control Pa...` (3)
  - `[Home] IOT Senso...` (3)
  - `Home` (1)
  - `Motor Control Page` (1)



# Water Pump Gauge Node

The screenshot displays the Node-RED web interface in a Firefox browser window. The address bar shows the URL `127.0.0.1:1880/#flow/f5941c08d212d35d`. The interface is divided into three main sections:

- Left Panel (Node Palette):** Contains a search bar and two categories of nodes:
  - common:** Includes nodes like `Inject`, `debug`, `complete`, `catch`, `status`, `link in`, `link call`, `link out`, and `comment`.
  - function:** Includes `function` and `switch` nodes.
- Flow Canvas:** Shows a flow named "Flow 1" with several nodes connected. The `Water Pump Status` node is highlighted with an orange border.
- Right Panel (Edit Gauge Node):** Displays the configuration for the selected `Water Pump Status` node. The configuration includes:
  - Group:** `[Motor Control Page] Water Pump Contr`
  - Size:** `6 x 5`
  - Type:** `Compass`
  - Label:** `Water Pump Status`
  - Value format:** `{{value}}`
  - Units:** `optional sub-label`
  - Range:** `min 0 max 10`
  - Class:** `Optional CSS class name(s) for widget`
  - Name:** (empty field)

The bottom status bar indicates the URL `127.0.0.1:1880/#editor-tab-properties`.

# IBM out Node

Activities Firefox Web Browser Nov 17 2:00 PM

WhatsApp MIT App Inv Terrific Wa IBM IBM Cloud IBM Watson W esp32-dht2 Node-RED Node-RE X Firebase co

127.0.0.1:1880/#flow/f5941c08d212d35d

Node-RED

Flow 1

filter nodes

common

- inject
- debug
- complete
- catch
- status
- link in
- link call
- link out
- comment

function

- function
- switch

Output Node

Temperature

Humidity

Soil Moisture

Water Pump Status

IBM IoT

connected

http

http

127.0.0.1:1880/#editor-tab-properties

Edit ibmiot out node

Delete Cancel Done

Properties

- Authentication: API Key
- API Key: API key
- Output Type: Device Command
- Device Type: IOT\_Device
- Device Id: Smart\_Farming
- Command Type: Motor\_Control
- Format: json
- Data: 1
- QoS: 0
- Name: IBM.IoT

Enabled

config

all unused

On all flows

cloudantplus

- My\_db 1

ibmiot

- API key 2

ui\_base

- Node-RED Dashboard

ui\_group

- [Motor Control Pa... 3
- [Home] IOT Senso... 3

ui\_tab

- Home 1
- Motor Control Page 1

# Button Node

The screenshot displays the Node-RED web interface in a Firefox browser window. The address bar shows the URL `127.0.0.1:1880/#flow/f5941c08d212d35d`. The interface is divided into several panels:

- Left Panel (filter nodes):** Contains a search bar and two categories of nodes:
  - common:** inject, debug, complete, catch, status, link in, link call, link out, comment.
  - function:** function, switch.
- Flow 1:** A central workspace showing a flow of nodes. The flow starts with a `smart_farming` node, followed by a `connected` node, then a series of function nodes: `Temperature`, `Humidity`, `Soil_Moisture`, `Motor_Pump_Status`, `Motor_ON`, and `Motor_OFF`. These are followed by a `json` node and a `function 1` node.
- Edit button node:** A configuration panel for the selected `Motor_ON` node. It includes fields for:
  - Group:** [Motor Control Page] Water Pump Contr
  - Size:** 6 x 1
  - Icon:** optional icon
  - Label:** Motor ON
  - Tooltip:** optional tooltip
  - Color:** optional text/icon color
  - Background:** optional background color
  - When clicked, send:**
    - Payload:** {"Motor\_Control": "Motor\_ON"}
    - Topic:** msg. Motor\_ON
  - Enabled:** Radio button (checked)
- config:** A panel on the right showing configuration for various components, including `cloudantplus`, `ibmiot`, `ui_base`, `ui_group`, and `ui_tab`.



Activities Firefox Web Browser Nov 17 2:01 PM

WhatsApp MIT App In Terrific Wa IBM IBM Cloud IBM Watson esp32-dht2 Node-RED Node-RE x Firebase co

127.0.0.1:1880/#flow/f5941c08d212d35d

Node-RED

filter nodes Flow 1

common

- inject
- debug
- complete
- catch
- status
- link in
- link call
- link out
- comment

function

- function
- switch

smart\_farming

connected

Temperature

Humidity

Soil\_Moisture

Motor\_Pump\_Status

Motor\_ON

Motor\_OFF

json

function 1

127.0.0.1:1880/#editor-tab-properties

Edit button node

Delete Cancel Done

Properties

Group [Motor Control Page] Water Pump Contr

Size 6 x 1

Icon optional icon

Label Motor OFF

Tooltip optional tooltip

Color optional text/icon color

Background optional background color

When clicked, send:

Payload {"Motor\_Control": "Motor\_OFF"}

Topic msg. Motor\_OFF

Enabled

config

all unused

On all flows

cloudantplus

My\_db 1

ibmiot

API key 2

ui\_base

Node-RED Dashboard

ui\_group

[Motor Control Pa... 3

[Home] IOT Senso... 3

ui\_tab

Home 1

Motor Control Page 1

# HTTP IN Node

The screenshot displays the Node-RED web interface in a Firefox browser window. The address bar shows the URL `127.0.0.1:1880/#flow/f5941c08d212d35d`. The main workspace shows a flow named "Flow 1" with an "IBM IoT" node (labeled "connected") connected to several function nodes. A dialog box titled "Edit http in node" is open, showing the configuration for an HTTP IN node. The dialog has tabs for "Properties", "Code", and "UI". The "Properties" tab is active, showing the following settings:

- Method: GET
- URL: /motor\_control
- Name: Motor Control

At the bottom of the dialog, there is an "Enabled" checkbox which is currently unchecked. The right sidebar shows the "config" tab with a list of nodes and their counts, including "My\_db" (1), "API key" (2), "Node-RED Dashboard", "ui\_base", "ui\_group", "[Motor Control Pa..." (3), "[Home] IOT Senso..." (3), "Home" (1), and "Motor Control Page" (1).

WhatsAppMIT App InTerrific WaIBMIBM CloudIBM WatsorW esp32-dht2Node-REDNode-RED XFirebase co

← → ↺ 127.0.0.1:1880/#flow/f5941c08d212d35d

Node-REDDeploy

filter nodes

Flow 1

common

injectdebugcompletecatchstatuslink inlink calllink outcomment

function

functionswitch

IBM IoT

connected

Motor Control

Sensor\_Data

sm

Te

Hu

So

Mo

Mo

Mo

fu

Edit http in node

DeleteCancelDone

Properties

MethodGET

URL/sensor\_data

NameSensor\_Data

Enabled

config

allunused

On all flows

cloudantplus

My\_db1

ibmiot

API key2

ui\_base

Node-RED Dashboard

ui\_group

[Motor Control Pa...3

[Home] IOT Senso...3

ui\_tab

Home1

Motor Control Page1

127.0.0.1:1880/#editor-tab-properties

# Function Node for Sensor Data

The screenshot displays the Node-RED web interface in a Firefox browser window. The address bar shows the URL `127.0.0.1:1880/#flow/f5941c08d212d35d`. The interface is divided into several panels:

- Left Panel (Nodes):** Contains a search bar and two categories of nodes: **common** (inject, debug, complete, catch, status, link in, link call, link out, comment) and **function** (function, switch). The **function** node is selected.
- Flow 1:** A workflow diagram showing a sequence of nodes: `smart_farming` (connected), `Temperature`, `Humidity`, `Soil_Moisture`, `Motor_Pump_Status`, `Motor_ON`, `Motor_OFF`, `json`, and `function 1`.
- Edit function node:** A panel for configuring the selected function node. It includes a **Properties** section with a **Name** field set to `function 1`. Below this are tabs for **Setup**, **On Start**, **On Message** (selected), and **On Stop**. The **On Message** tab contains a code editor with the following JavaScript code:

```
1 msg.payload = { "Temperature": global.get("t"), "Humidity": global.get("h") };
2 return msg;
```
- Right Panel (config):** A configuration panel for the flow. It shows a list of nodes used in the flow, categorized by type (e.g., `cloudantplus`, `ibmiot`, `ui_base`, `ui_group`, `ui_tab`). The list includes nodes like `My_db`, `API key`, `Node-RED Dashboard`, `[Motor Control Pa...`, `[Home] IOT Senso...`, `Home`, and `Motor Control Page`.