

Project development phase

Sprint - 2

Date	13 November 2022
Team ID	PNT2022TMID53304
Project Name	Project - Industry-specific intelligent fire management system
Maximum Marks	20 marks

▼ IN Sprint 2 31 Oct – 5 Nov (2 issues)

IN-4 In industry, sensor sense the fire and smoke. **SENSOR & ACTUATOR**

IN-5 If the sensor detected the fire, next step is extinguishing the fire with the help of Sprinkler. **SENSOR & ACTUATOR**

⇒ Configure the connection security and create API keys that are used in the Node-RED service for accessing the IBM IoT Platform.

87°F Partly sunny

Windows taskbar icons: File Explorer, Microsoft Edge, Google Chrome, Microsoft Word, etc.

ENG IN 3:10 PM 11/10/2022

US-2 Create a Node-RED service

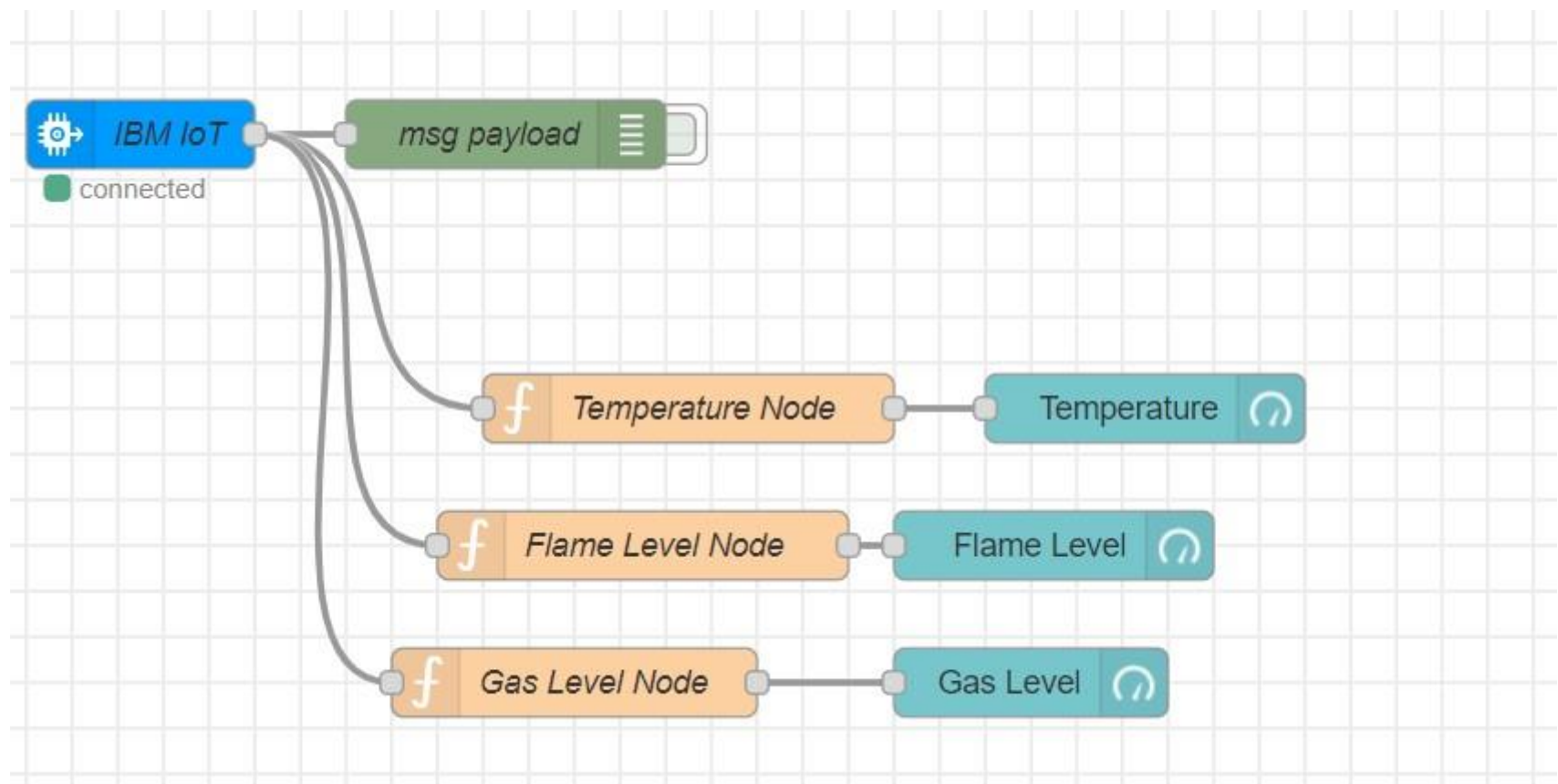


Fig1 - Monitoring the sensor values - Temperature, Flame Level, Gas Level. These values are randomly generated by IBM WATSON IOT PLATFORM.

```
11/3/2022, 9:04:47 AM node: msg payload
iot-2/type/B11M3EDeviceType/id/B11M3EDeviceID/evt/event_1/fmt/json : msg.payload : Object
  ▶ { Temperature: 1, Flame_Level: 62, Gas_Level: 38 }

11/3/2022, 9:04:50 AM node: msg payload
iot-2/type/B11M3EDeviceType/id/B11M3EDeviceID/evt/event_1/fmt/json : msg.payload : Object
  ▶ { Temperature: 1, Flame_Level: 78, Gas_Level: 11 }

11/3/2022, 9:04:53 AM node: msg payload
iot-2/type/B11M3EDeviceType/id/B11M3EDeviceID/evt/event_1/fmt/json : msg.payload : Object
  ▶ { Temperature: 99, Flame_Level: 36, Gas_Level: 55 }

11/3/2022, 9:04:56 AM node: msg payload
iot-2/type/B11M3EDeviceType/id/B11M3EDeviceID/evt/event_1/fmt/json : msg.payload : Object
  ▶ { Temperature: 71, Flame_Level: 24, Gas_Level: 46 }

11/3/2022, 9:05:00 AM node: msg payload
iot-2/type/B11M3EDeviceType/id/B11M3EDeviceID/evt/event_1/fmt/json : msg.payload : Object
  ▶ { Temperature: 38, Flame_Level: 92, Gas_Level: 63 }

11/3/2022, 9:05:03 AM node: msg payload
iot-2/type/B11M3EDeviceType/id/B11M3EDeviceID/evt/event_1/fmt/json : msg.payload : Object
  ▶ { Temperature: 74, Flame_Level: 98, Gas_Level: 84 }

11/3/2022, 9:05:06 AM node: msg payload
iot-2/type/B11M3EDeviceType/id/B11M3EDeviceID/evt/event_1/fmt/json : msg.payload : Object
  ▶ { Temperature: 87, Flame_Level: 81, Gas_Level: 44 }
```

Fig 2 - Temperature, Flame Level, Gas Level values displayed in deploy tab in node-red

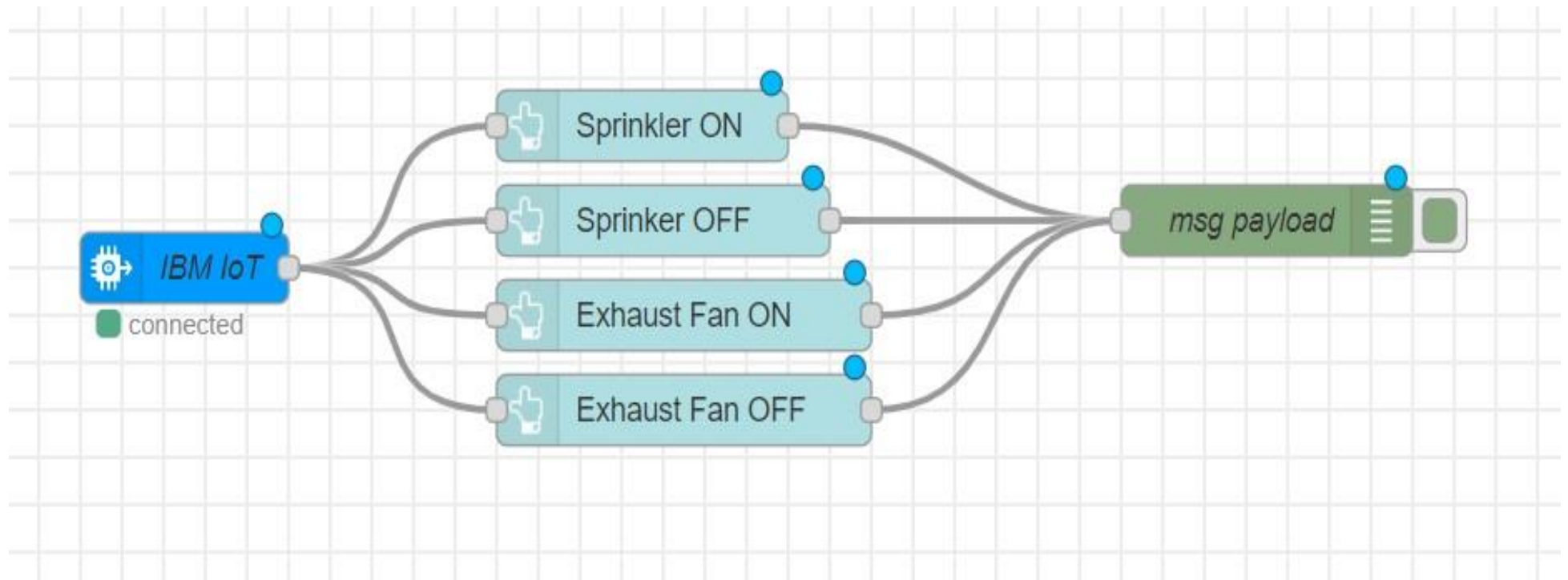


Fig 3 - Control buttons (Sprinkler ON, Sprinkler OFF, Exhaust Fan ON, Exhaust Fan OFF)

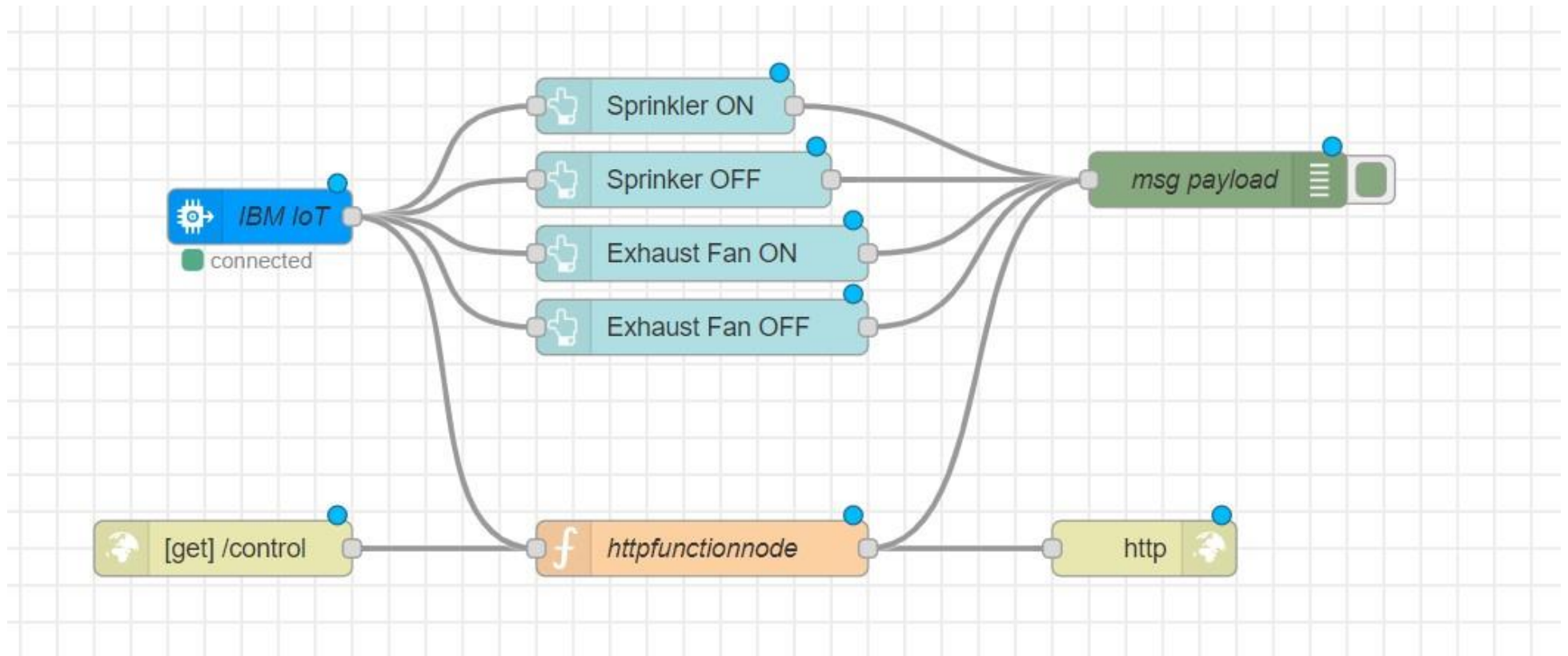


Fig 4 - Using HTTP in and HTTP response in network option, <http://127.0.0.1:1880/#flow/f74f1b96473dc208/control> will display the control options

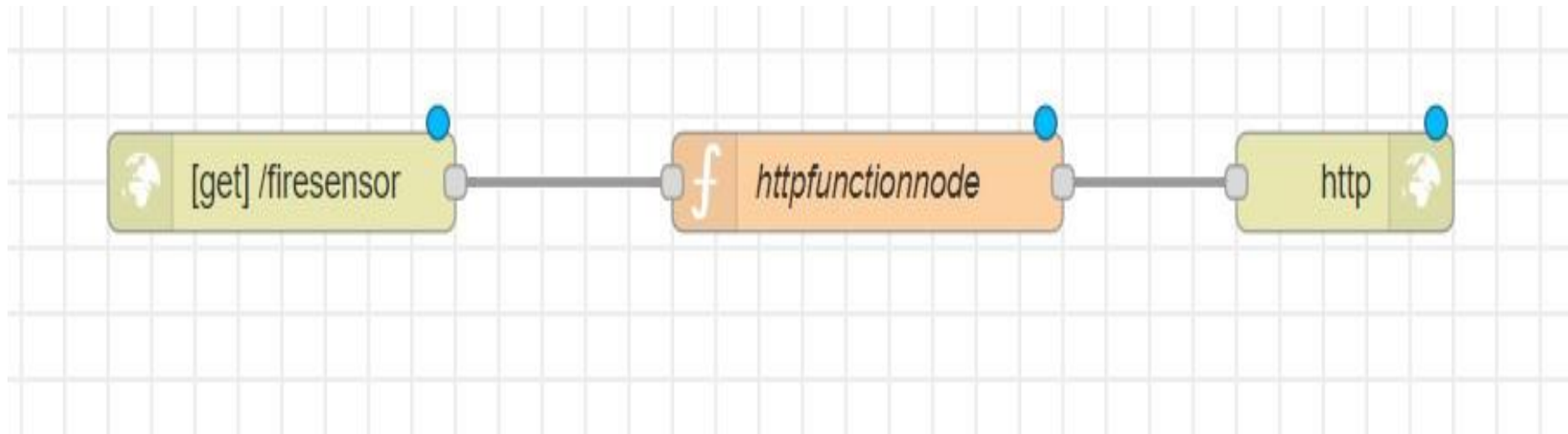


Fig 5 - Using HTTP in and HTTP response in network option, <http://127.0.0.1:1880/#flow/f74f1b96473dc208/firesensor> will display the sensor values like Temperature, Gas Level and Flame Level from the IBM WATSON IOT PLATFORM.

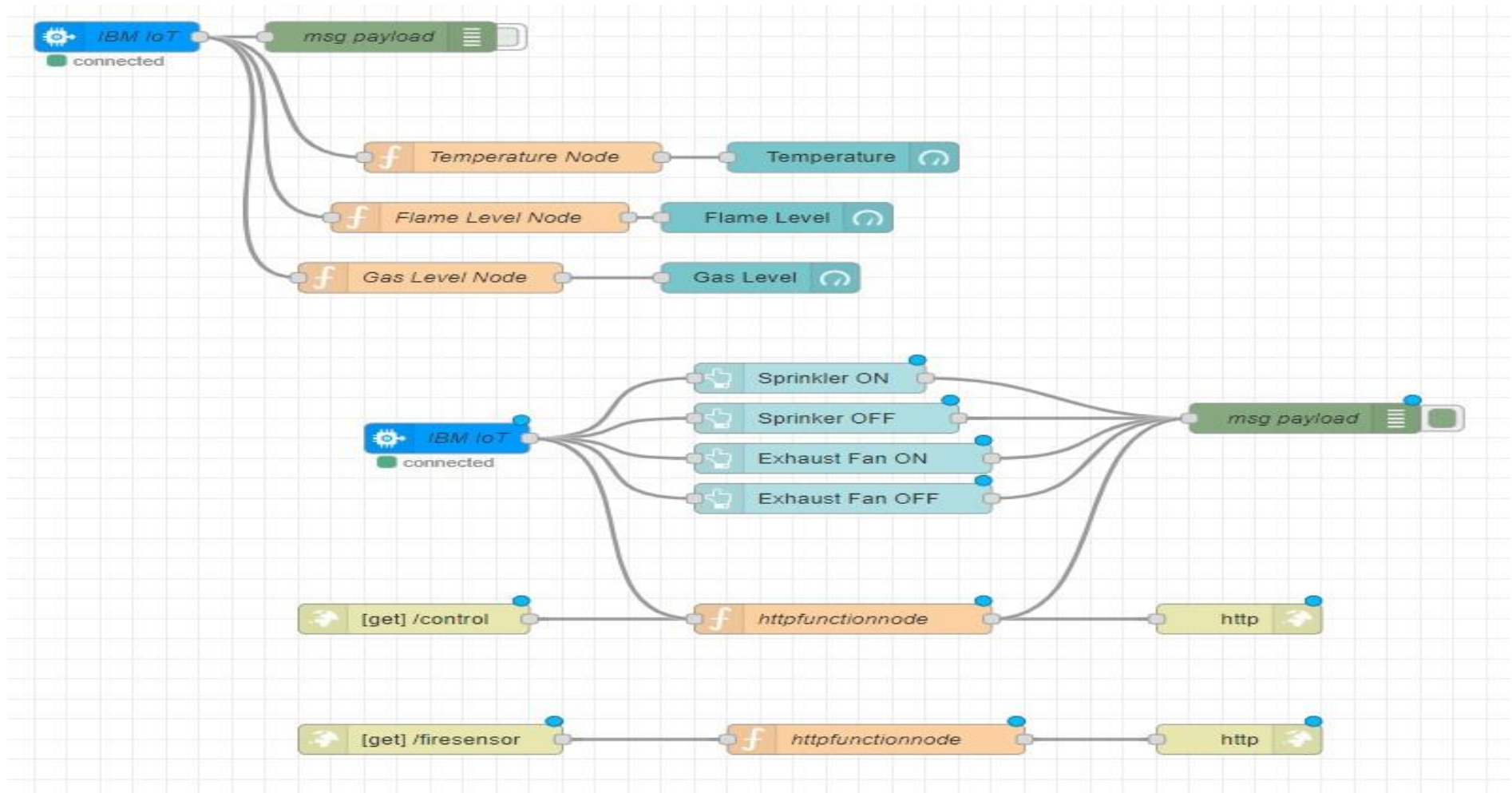


Fig 6 - Entire Node-Red connection for our project

Edit ibmiot in node

Delete

Cancel

Done

⚙ Properties

⚙

📄

🖼

☔ Authentication

API Key

▼

🔑 API Key

a6cb71b59d73b36b

▼

✎

⚙ Input Type

Device Event

▼

📡 Device Type

☐ All or

B11M3EDeviceType

👤 Device Id

☐ All or

B11M3EDeviceID

☰ Event

☒ All or

+

📄 Format

☐ All or

json

🌟 QoS

0

▼

📍 Name

IBM IoT

📍 Service

registered

Fig 7 - Properties of IBM IOT are shown. The API key, Device Type, Device ID are taken from IBM IOT WATSON PLATFORM.

Edit function node

Delete

Cancel

Done

Properties

Name

Temperature Node

Setup

On Start

On Message

On Stop

```
1 msg.payload = msg.payload.Temperature
2 global.set('t',msg.payload)
3 return msg;
```

Edit function node

Delete

Cancel

Done

⚙️ Properties

⚙️ 📄 🖨️

🔖 Name

Flame Level Node

📄 ▼

⚙️ Setup

On Start

On Message

On Stop

1

msg.payload = msg.payload.Flame_Level

2

global.set("f",msg.payload)

3

return msg;

Edit function node

Delete

Cancel

Done

⚙️ Properties

⚙️ 📄 🖨️

🔖 Name

Gas Level Node

📄 ▼

⚙️ Setup

On Start

On Message

On Stop

1

msg.payload = msg.payload.Gas_Level

2

global.set("g",msg.payload)

3

return msg;

Fig 8 - Properties of Function Node -Temperature Node, Flame Level Node, Gas Level Node.

Edit gauge node

Delete

Cancel

Done

Properties

Group

[Control] Industry specific intelligent fire

Size

auto

Type

Gauge

Label

Temperature

Value format

{{value}}

Units

C

Range

min

max

Colour gradient

Sectors

0 10

Name

Fig 9 - Properties of Temperature Gauge.

Edit gauge node

Delete

Cancel

Done

⚙ Properties

⚙

📄

🖨

📊 Group

[Control] Industry specific intelligent fire ▾

✎

📏 Size

auto

☰ Type

Gauge ▾

🏷 Label

Flame Level

🔢 Value format

{{value}}

📏 Units

units

Range

min 0max 10

Colour gradient

Sectors

0...optional...optional...10

🏷 Name

Fig 9 - Properties of Flame Level Gauge.

Edit gauge node

Delete

Cancel

Done

⚙ Properties

⚙

📄

🖨

📊 Group

[Control] Industry specific intelligent fire ▾

✎

📏 Size

auto

☰ Type

Gauge ▾

🔗 Label

Gas Level

🔗 Value format

{{value}}

🔗 Units

units

Range

min 0max 10

Colour gradient

Sectors

0...optional...optional...10

🔖 Name

Fig 9 - Properties of Gas Level Gauge.

Edit ibmiot in node

Delete

Cancel

Done

Properties

Authentication

API Key

▼

API Key

a6cb71b59d73b36b

▼

Input Type

Device Command

▼

Device Type

☐ All or

B11M3EDeviceType

Device Id

☐ All or

B11M3EDeviceID

Command

☐ All or

onoff

Format

☐ All or

String

QoS

0

▼

Name

IBM IoT

Service

registered

Fig 9 - Properties of IBM IOT Node.

Edit button node

Delete

Cancel

Done

Properties

Group

[Control] Industry specific intelligent fi ▾

Size

auto

Icon

optional icon

Label

Sprinkler ON

Tooltip

optional tooltip

Color

optional text/icon color

Background

optional background color

When clicked, send:

Payload

▾ {} {"command":"SprinklerON"} ...

Topic

▾ msg. topic

➔ If msg arrives on input, emulate a button click:

☐

Fig 10 - Properties of Sprinkler ON button node.

Edit http in node

Delete

Cancel

Done

Properties

Method

GET

▼

URL

/control

Name

Name

Fig 10 - Properties of HTTP Node with method GET and URL /control,

Edit function node

Delete

Cancel

Done

Properties

Name

httpfunctionnode

Setup

On Start

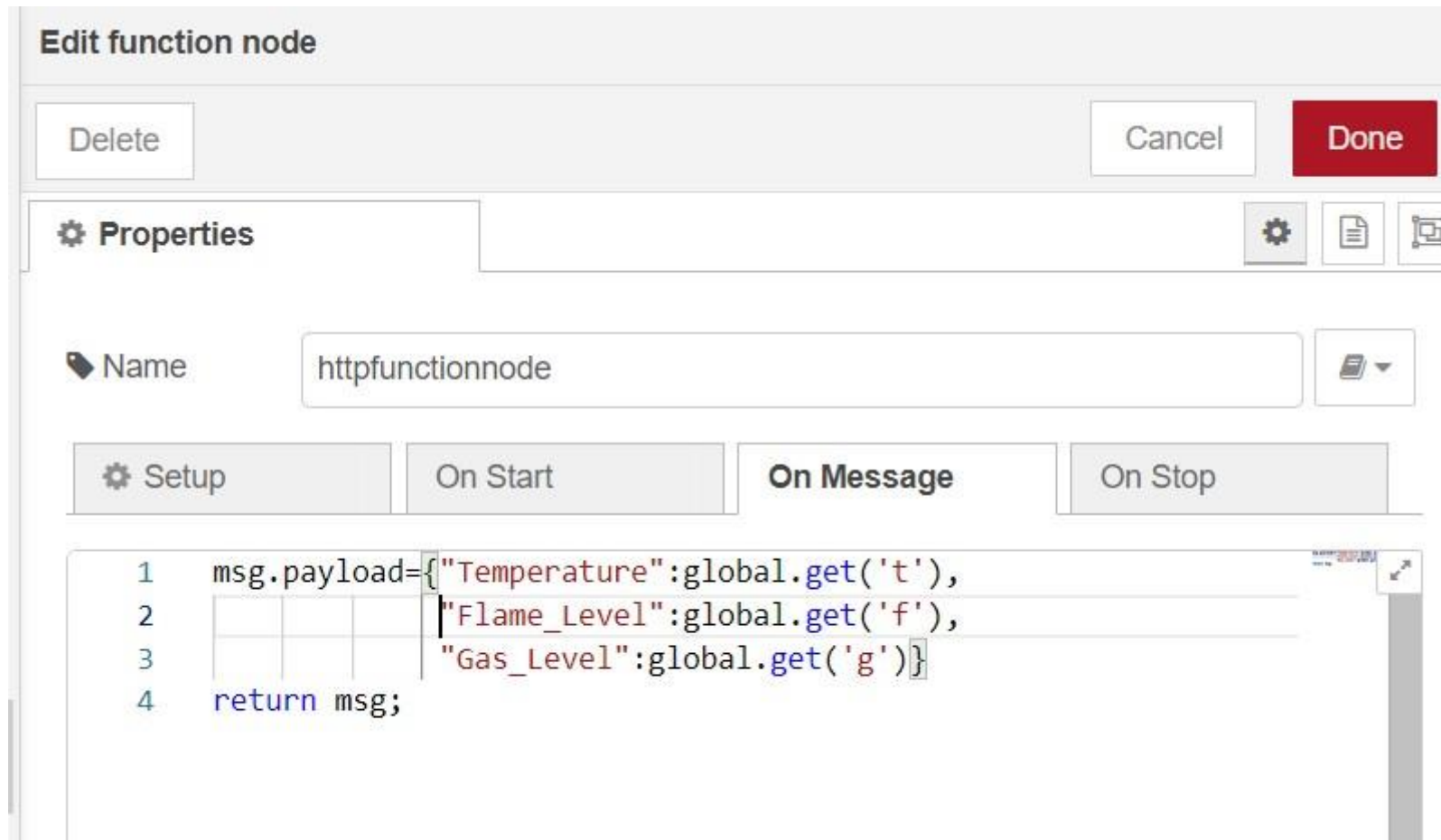
On Message

On Stop

1 msg.payload = msg.payload.command

2 return msg;

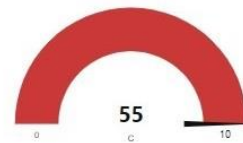
Fig 11 - Properties of Control HTTP Function Node.



Control

Industry specific intelligent fire
management system

Temperature



SPRINKLER ON

EXHAUST FAN ON

SPRINKER OFF

EXHAUST FAN OFF

Flame Level



Gas Level



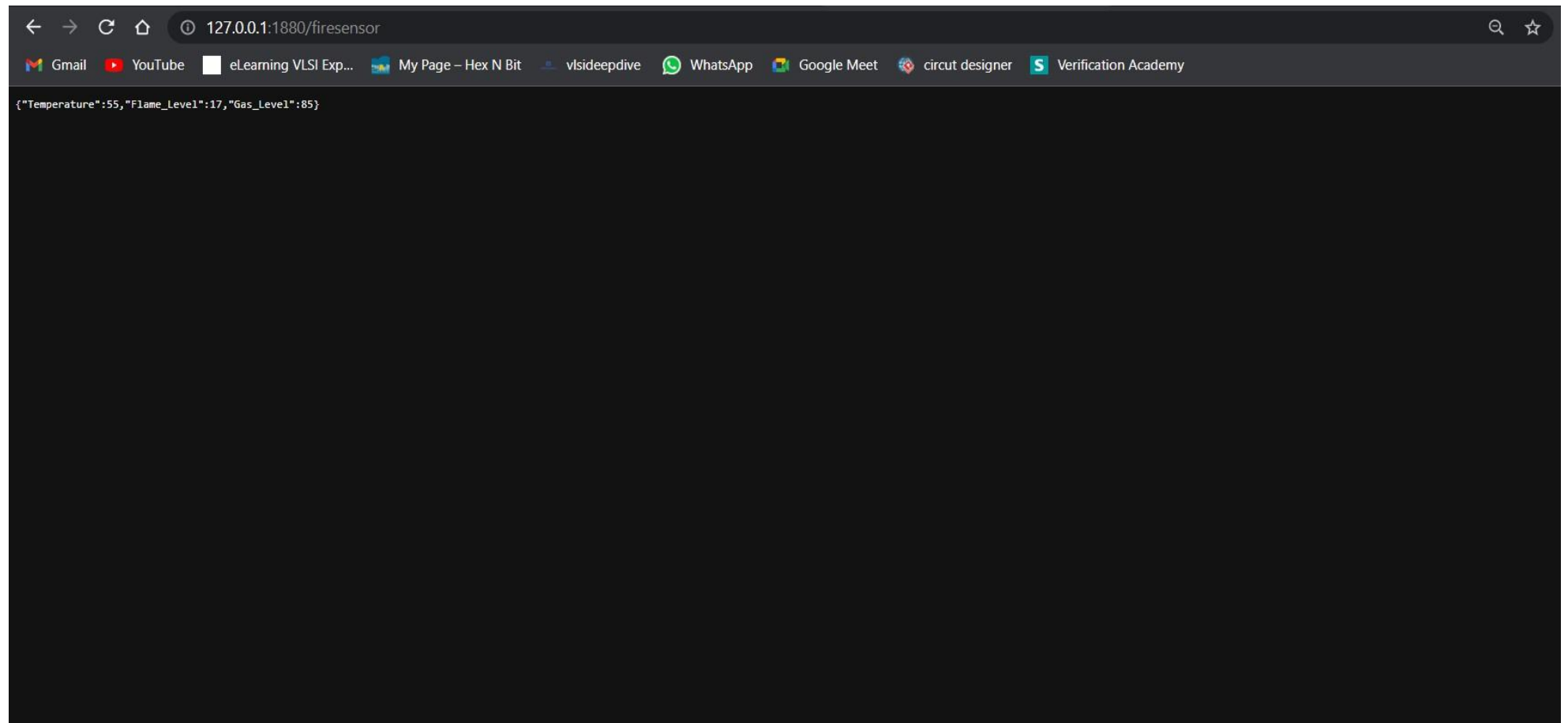


Fig 12 - Properties of Monitor HTTP Function Node

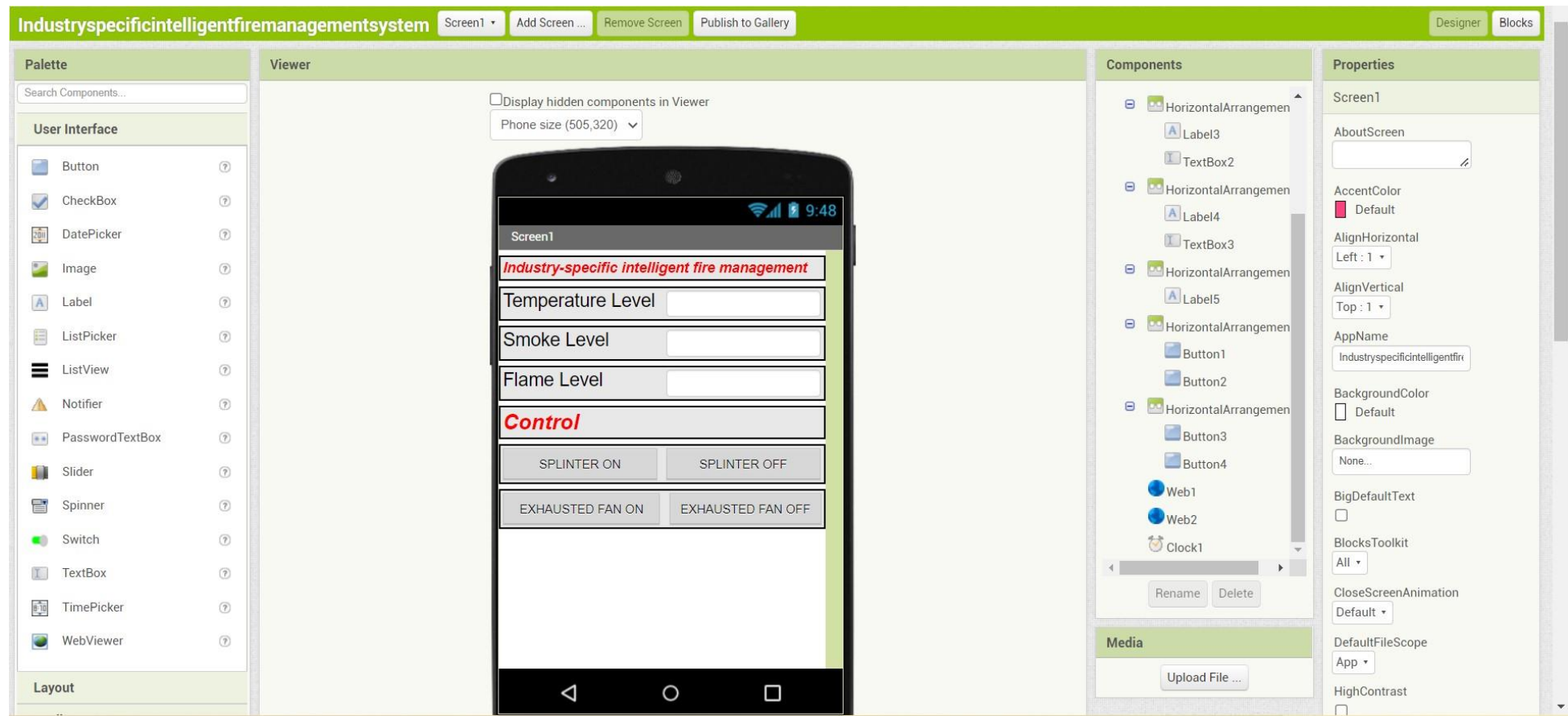


Fig 13 - Front-end APP for our project, to display the Temperature Level, Smoke Level and Flame Level with control buttons like Sprinkler ON and OFF and Exhaust Fan ON and OFF