

## Project development phase

### Sprint - 2

Date	04 November 2022
Team ID	PNT2022TMID05194
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.

**The API key has been added.**

Authentication tokens are non-recoverable. If you misplace this token, you will need to re-register the API key to generate a new authentication token.

### API Key Information

Description Arduino

Role	Device Application
------	--------------------

Expires	Never
---------	-------



Close

Type the app description to search for

## 1 Simulation running

US-2 Create a Node-RED service

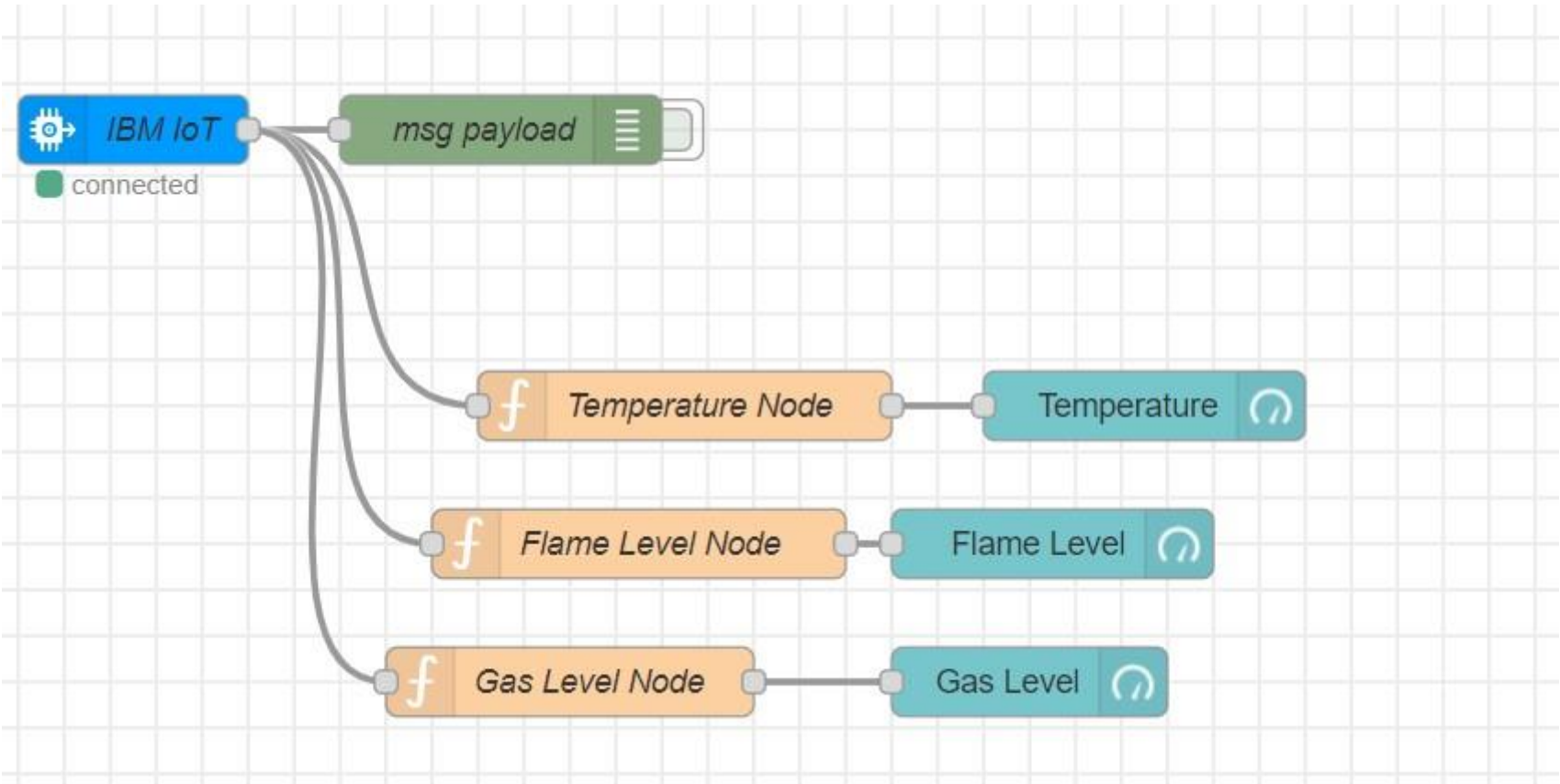


Fig1 - Monitoring the sensor values - Temperature, Flame Level, Gas Level. These values are randomly generated by IBM WATSON IOT PLATFORM.

```
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

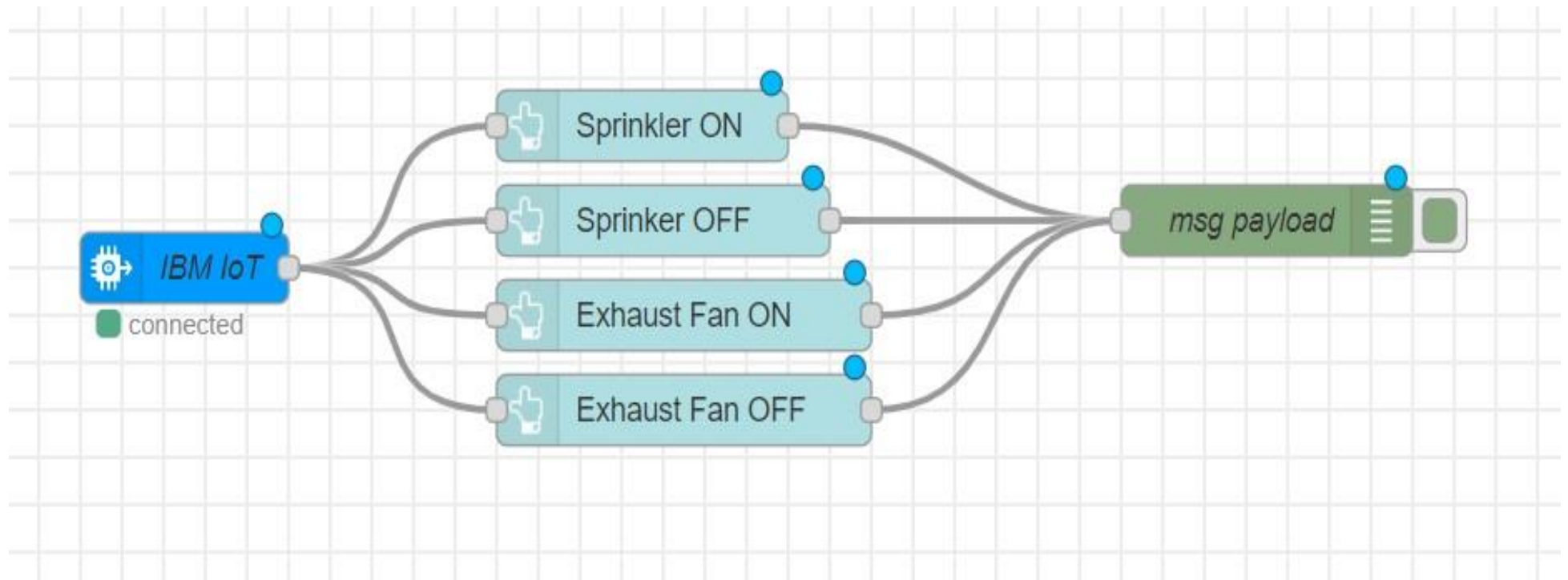


Fig 3 - Control buttons (Sprinkler ON, Sprinkler OFF, Exhaust Fan ON, Exhaust Fan OFF)

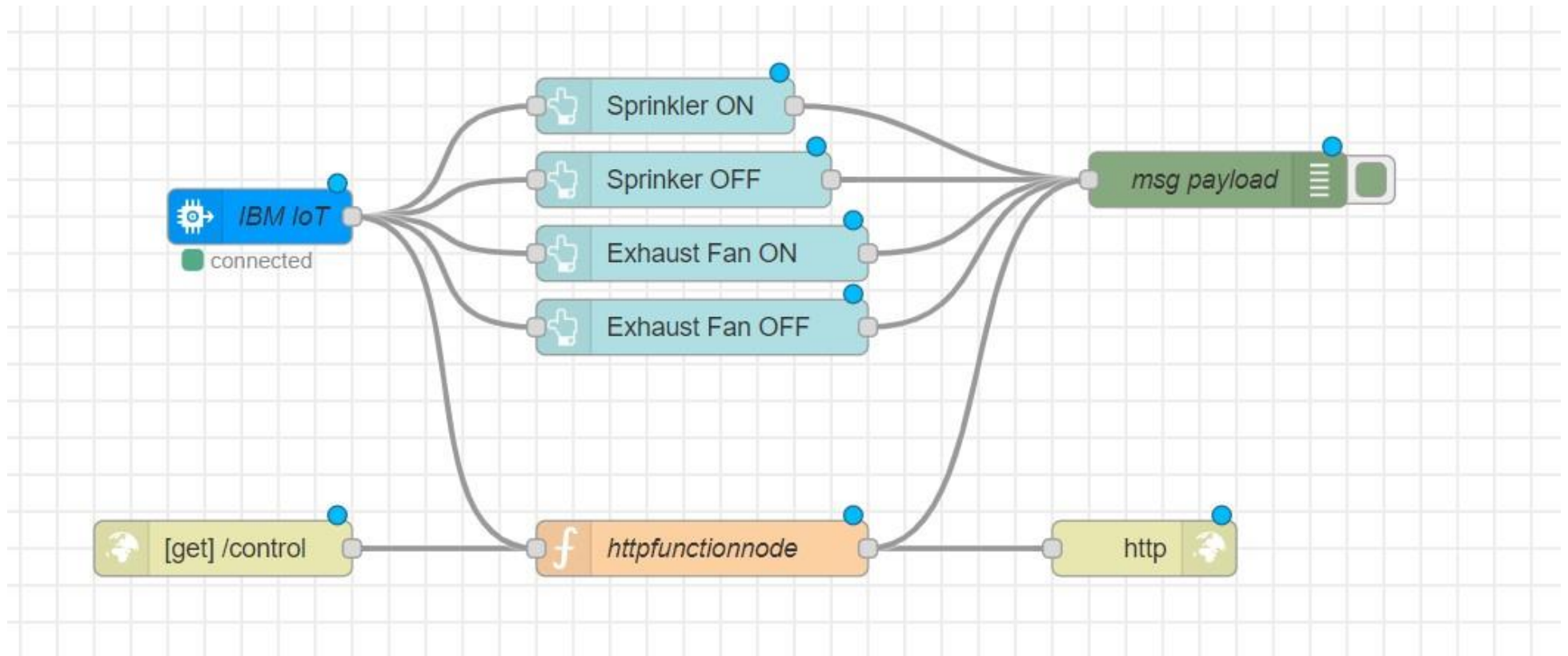


Fig 4 - Using HTTP in and HTTP response in network option, <http://127.0.0.1:1880/#flow/f74f1b96473dc208/control> will display the control options

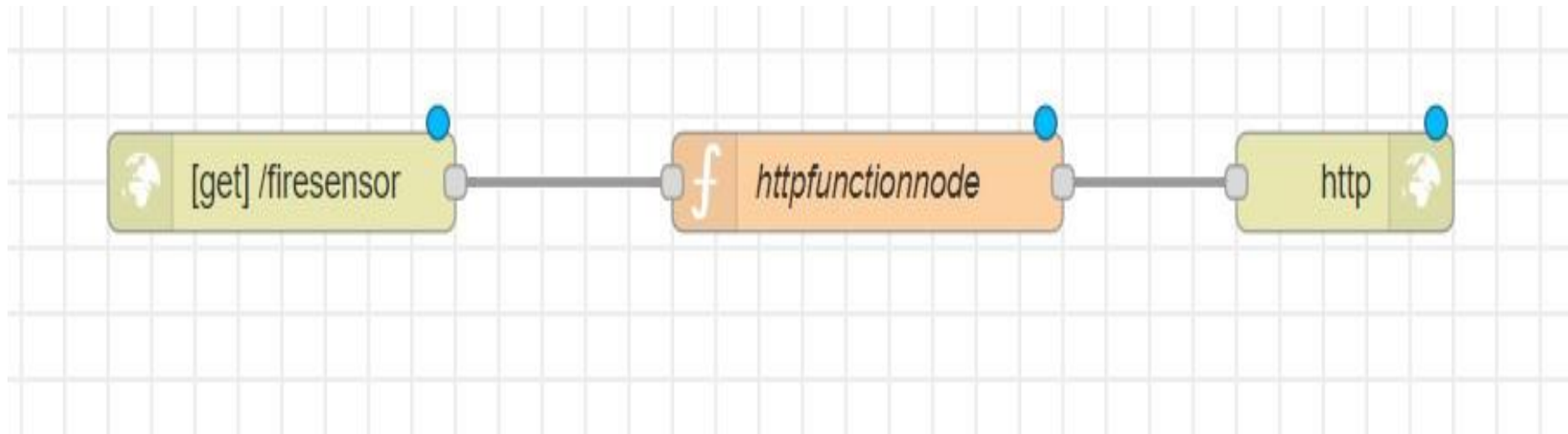




Fig 5 - Using HTTP in and HTTP response in network option, <http://127.0.0.1:1880/#flow/f74f1b96473dc208/firesensor> will display the sensor values like Temperature, Gas Level and Flame Level from the IBM WATSON IOT PLATFORM.

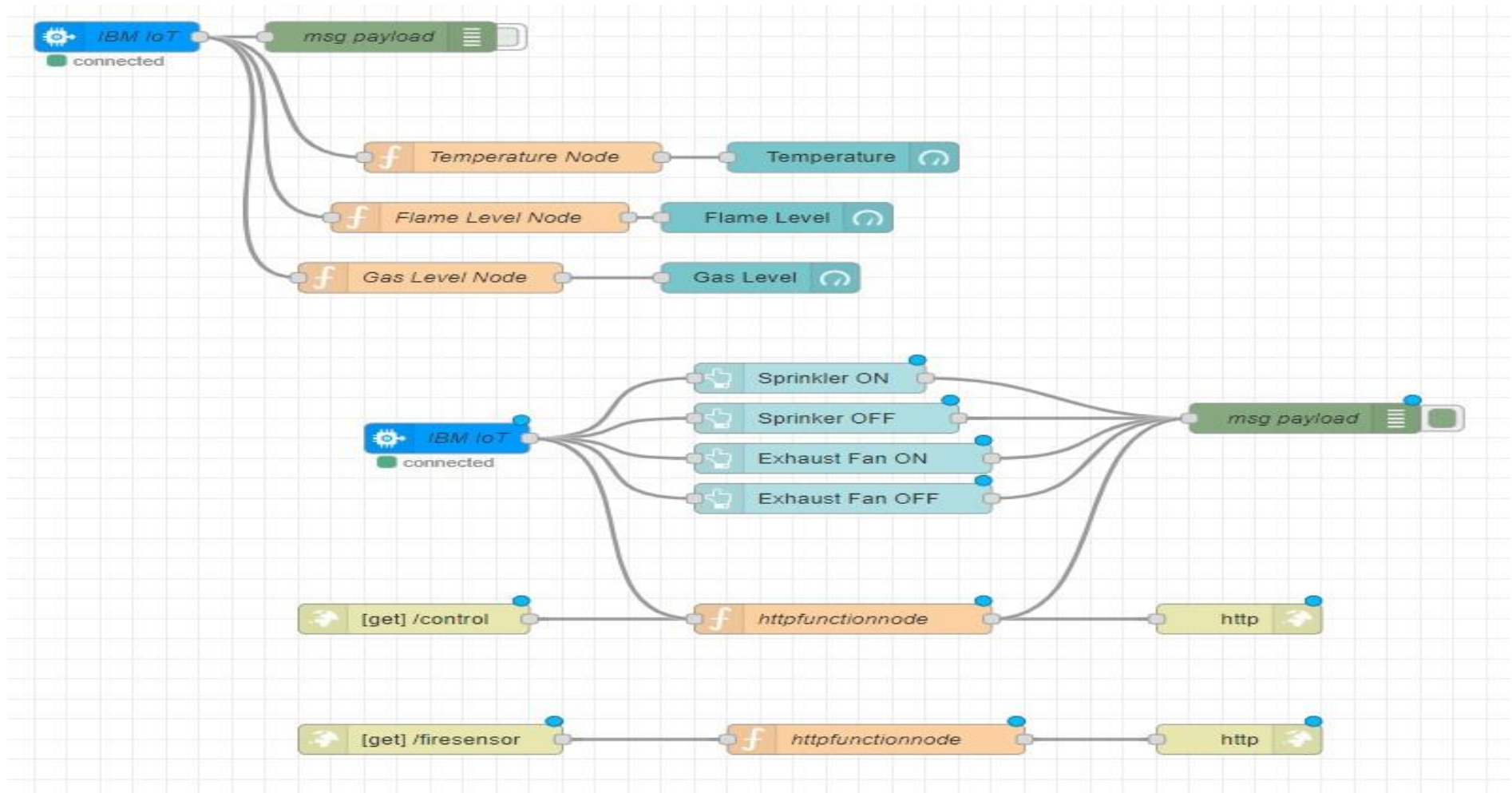




Fig 6 - Entire Node-Red connection for our project

**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

0

max

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

min0max10

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

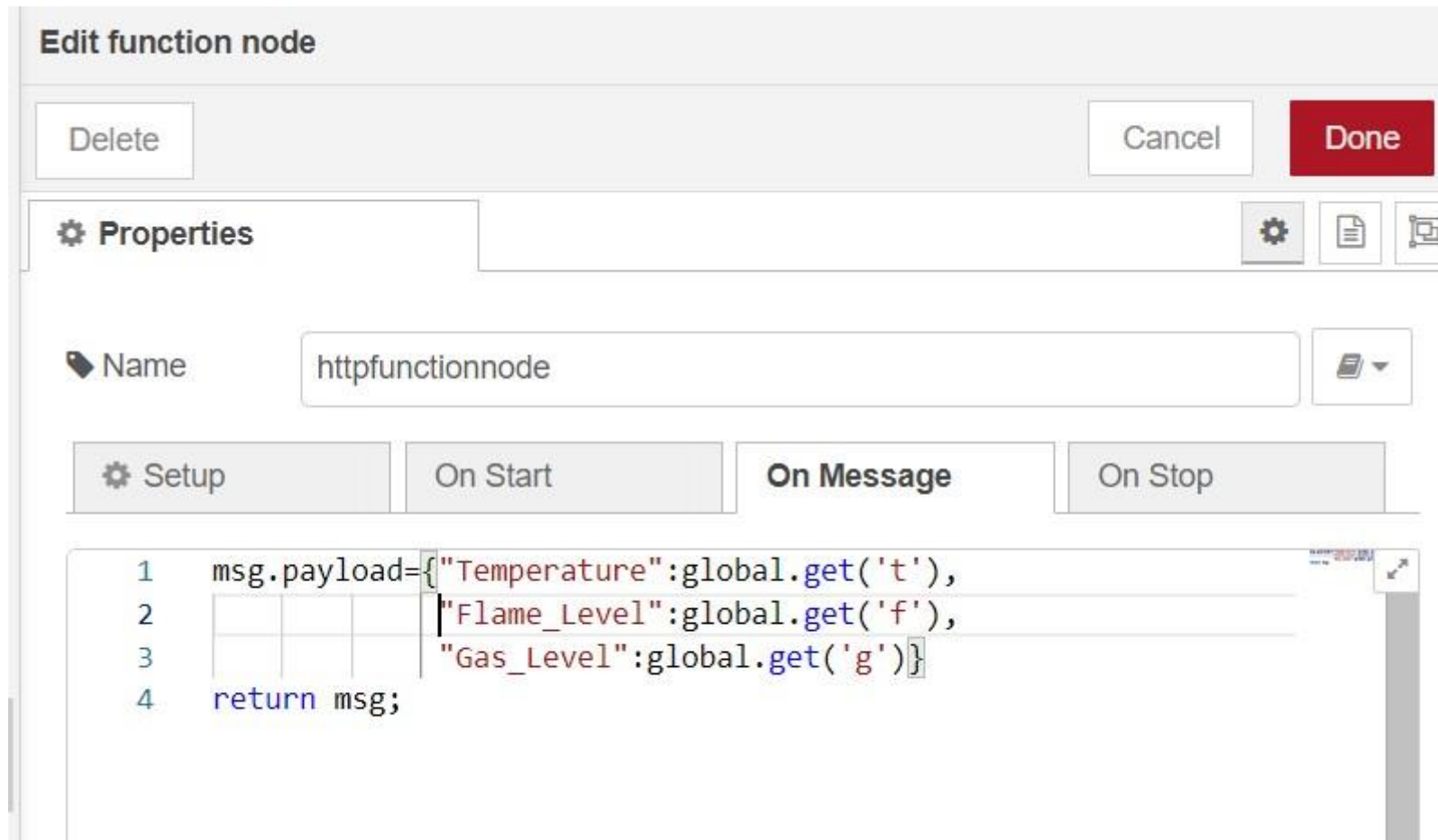
**On Message**

On Stop

1 msg.payload = msg.payload.command

2 return msg;

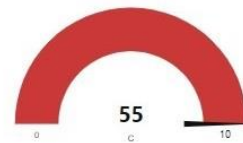
Fig 11 - Properties of Control HTTP Function Node.



Control

Industry specific intelligent fire  
management system

Temperature



SPRINKLER ON

EXHAUST FAN ON

SPRINKER OFF

EXHAUST FAN OFF

Flame Level



Gas Level



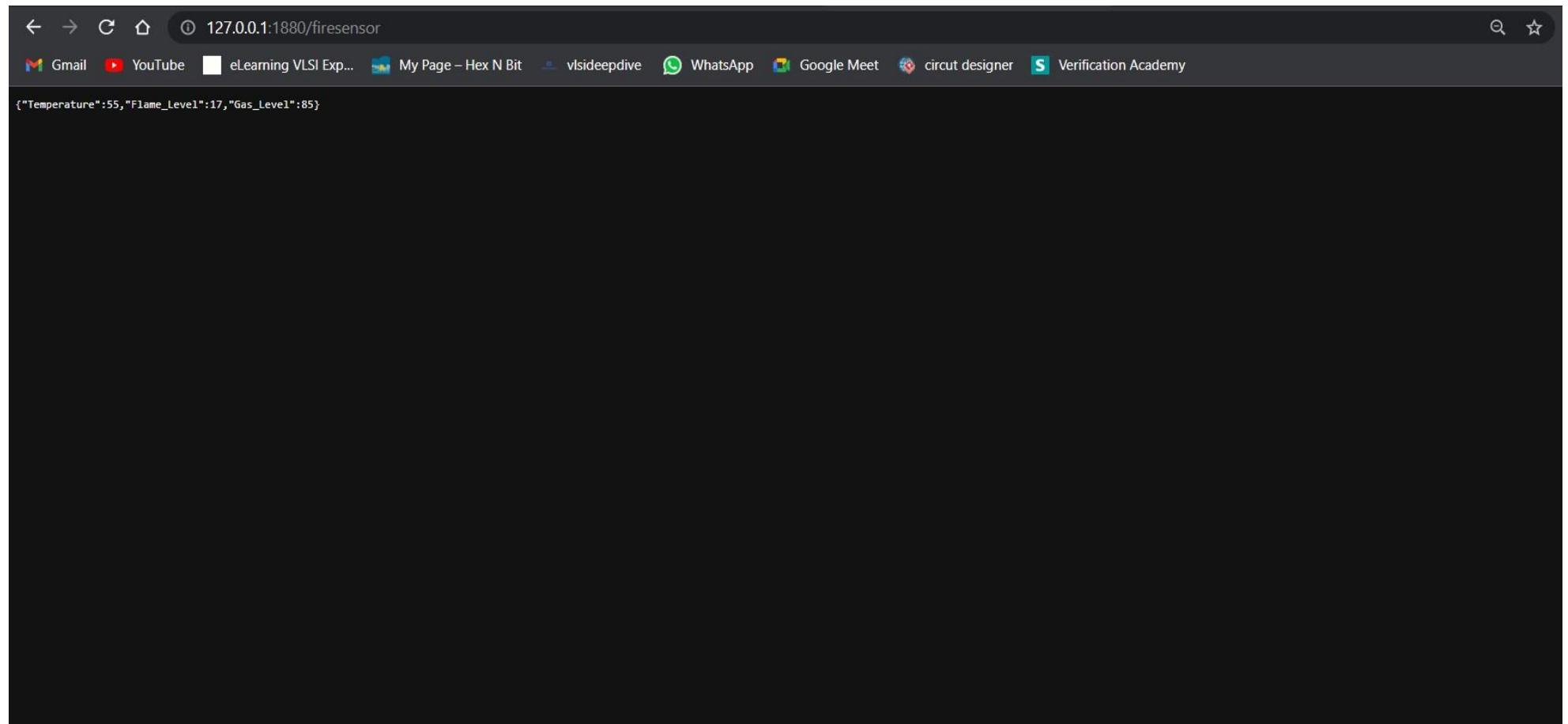


Fig 12 - Properties of Monitor HTTP Function Node

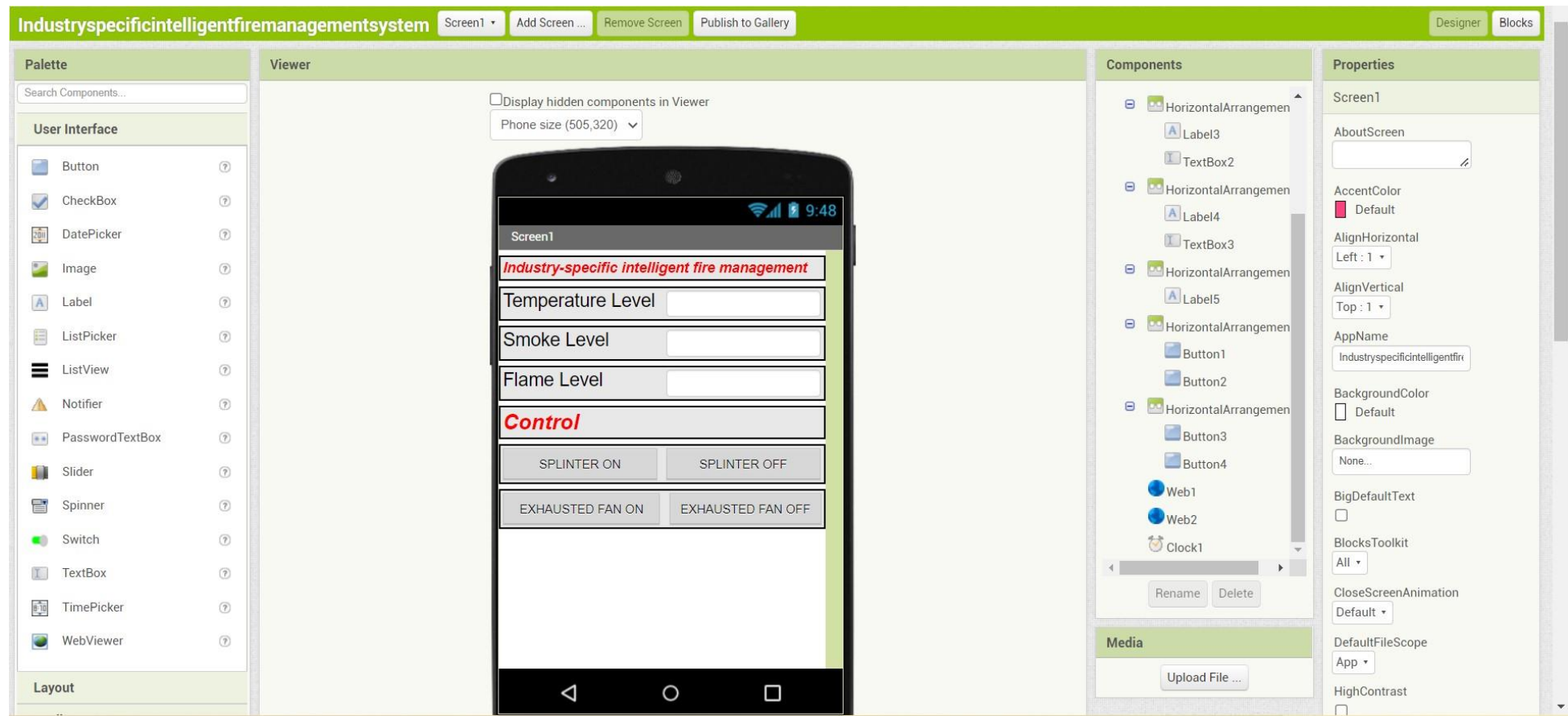


Fig 13 - Front-end APP for our project, to display the Temperature Level, Smoke Level and Flame Level with control buttons like Sprinkler ON and OFF and Exhaust Fan ON and OFF